



# Aquacheck

**Water & Environmental Chemistry Proficiency Testing Scheme**

## **Scheme Description**

### **LGC Standards Proficiency Testing**

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Aquacheck Scheme Description

Record of issue status and modifications

ISSUE	ISSUE DATE	DETAILS	AUTHORISED BY
14	Nov 2013	Amended unit for arsenic in metals in high salinity water trial sample. Identified analytes which are not covered by accreditation scope. Addition of information for traceability of assigned values.	M. Whetton
15	Feb 2014	Inclusion of samples for plutonium and uranium, residual bromine and UV absorbing organic constituents (254 nm) to Aquacheck trials. Addition of several substituted Phenols to 6B and 18B, Removal of phenol index from 6B and 18B. Inclusion of non-ionic surfactants to Sample 3, high chlorate & chlorite to Sample 3A, additional metals to Sample 12. Removal of fixed SDPA values for Sample 18A, update of fixed values for 13, 14, 19A, 19B and 19C.	M. Whetton
16	Jan 2015	Updated maximum concentration for total monosubstituted phenols in 6B and 18B. Updated fixed SDPA to reflect larger concentration range. Removed '180°C' from Total Dissolved Solids analytes. Inclusion of non-ionic surfactants to sample 11. Inclusion of samples for WFD in the main scheme. Sample name changed from Metals in high salinity water to Cations and anions in high salinity water and new analytes added to this sample. Diclofenac added to the pharmaceuticals trial sample. New samples added to the Aquacheck trials: BOD/COD at high concentration levels, haloacetic acids, synthetic pyrethroid insecticides, process water, microcystin-LR and perchlorate. Inclusion of subcontracting information in 'Test Materials' section.	M. Whetton
17	Oct 2015	Captan added to Fungicides trial sample. Disclaimers updated for non-accredited samples. Removed Hard copy Report information.	R. Sharma N. Mason
18	Jan 2016	1,2,4-trimethylbenzene and MTBE added to sample 6C. Samples 35 to 40 added in the main scheme, previously trials. Inclusion of samples for chelating agents, inorganic and organic fertilizer and low level CIP2 contaminants to Aquacheck trials. Process waters split into two groups sulfuric/tartaric acid and chloride. Removal of EDTA from pharmaceuticals trial.	R. Sharma
19	April 2016	Minor text changes made. Sample 7A and 19A split into 2 spiking solutions.	R. Sharma
20	June 2016	Amended format of sample 35 to 2 x 30ml and sample 38 to 1 x 60ml. Minor text changes made to sample 34D.	R. Sharma
21	Oct 2016	Accreditation status for 1,2,4-trimethylbenzene updated. Minor text changes made to Low Level CIP2 contaminants.	R. Sharma

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22	Jan 2017	<p>The addition of a number of pesticides to sample 8 (alachlor, cyromazine, picloram), 8B (chloroxuron, metoxuron, quinmerac, carbofuran), 9 (dimethoate) and 40 (cyprodinil, propiconazole, prothioconazole). Beryllium added to sample 12 and 17C. Amended SDPAs for sample 5G. New samples added to Aquacheck trials: acetate &amp; iodide, seawater (nutrients), bottled mineral water, trihalomethanes in swimming pool water, seawater (metals) and EQSD directive – low level pesticides. Removal of cations &amp; anions in high salinity water and the process water samples from trials.</p> <p>Additional information added to the range section.</p>	R. Sharma
23	May 2017	<p>The addition of ammoniacal nitrogen to sample 16. New sample added to Aquacheck trials: explosives in groundwater.</p>	R. Sharma
24	June 2017	<p>Accreditation status for ammoniacal nitrogen in sample 16 updated</p>	R. Sharma
25	Jan 2018	<p>Samples 41 and 42 added in the main scheme, previously trials. Captan removed from sample 40. Reorganisation of samples relating to herbicides; 8, 8B, 20 and 20B. Pesticides which have been moved: bromacil (8B, 20B), cyromazine (8B) and quinmerac (8). The addition of a number of pesticides to sample 8 (S-metolachlor, flufenacet, asulam, chloridazon, napropamide) and 8B (Monolinuron, Iodosulfuron methyl, mesosulfuron methyl, metsulfuron methyl, thifensulfuron methyl, tribenuron methyl, desethylatrazine, desisopropylatrazine, terbuthylazine, methiocarb, prosulfocarb, metribuzin, florasulam).</p> <p>New sample added to trials: soil texture and EQSD trial amended to be grouped as triazines, organophosphorus &amp; chlorinated solvents and organochlorines. Sample name changed for seawater (nutrients), seawater (metals) and trihalomethanes in swimming pool water to saline water (nutrients), saline water (metals) and trihalomethanes &amp; nutrients in recreational water. Removal of chelating agents and perchlorate from the trials.</p>	R. Sharma

Notes:

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

### **Scheme Aims and Organisation**

The primary aim of the Water & Environmental Chemistry Proficiency Testing Scheme (Aquacheck) is to enable laboratories performing the analysis of organic and inorganic chemicals in clean and wastewaters, sludges and soils to monitor their performance and compare it with that of their peers. Aquacheck also aims to provide information to participants on technical issues and methodologies relating to testing of such samples.

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

The Aquacheck scheme operates an advisory group made up of participants, industry experts and regulatory organisations. A list of advisory group members is available from LGC Standards on request. The advisory group meets twice a year and is concerned with all aspects of scheme development, operation and participant performance.

### **Test Materials**

Details of test materials available in Aquacheck are given in Appendix A. 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 Aquacheck 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 Aquacheck 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 Appendix A.

### **Methods**

Methods are listed in 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**

Aquacheck results are returned through our electronic reporting software, PORTAL, full instructions for which are provided by email. However, participants may request result submission forms on which to report and return results if they are unable to report through electronic means. This will incur an additional charge.

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

## APPENDIX A - 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. For some analytes, only the maximum is quoted. In these cases, the minimum will be 20% of the maximum value.

In order to replicate the variety of samples routinely received by participant laboratories, samples may be occasionally provided where the concentration of one the analytes is outside of the specified range.

## Aquacheck Scheme Description

### **SDPA**

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).

Two values may be included in the tables for the SDPA; a percentage value and a fixed value; given in brackets. Where the percentage SDPA would be less than the fixed value, the fixed value will be used in calculation of participants' performance scores. The fixed values shown are in the units in which the analytes should be reported.

### **Units**

This indicates the units used for the assessment of data. These are the units 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.

### **DP**

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

**Sample 1H**

**Supplied as:**

**Major Inorganic Components (in hard water)**

2 x 1L hard water sample  
 1 x 30mL kjeldahl nitrogen spiking solution  
 1 x 30mL total phosphorus spiking solution

Analyte	AV	Range	SDPA % (fixed)	Units	DP
Calcium	RMean	60-130	7.5 (1)	mgCa/L	2
Magnesium	RMean	2-10	7.5 (0.25)	mgMg/L	2
Total Hardness	RMean	50-150	10 (5)	mgCa/L	1
Alkalinity	RMean	150-300	10 (15)	mgHCO <sub>3</sub> /L	1
Potassium	RMean	1-5	7.5 (0.2)	mgK/L	3
Sodium	RMean	10-35	7.5 (0.5)	mgNa/L	2
Chloride	RMean	10-40	7.5 (2)	mgCl/L	2
Sulfate	RMean	10-40	7.5 (1)	mgSO <sub>4</sub> /L	2
Fluoride	RMean	1800	7.5 (75)	µgF/L	0
Conductivity (20°C)	RMean	300-700	7.5	µS/cm	1
Kjeldahl Nitrogen	Formulation	1-5	10 (0.1)	mgN/L	2
Total Phosphorus	RMean	0.5-2.6	10 (0.025)	mgP/L	2
Barium	RMean	20-180	10 (4)	µgBa/L	1

This sample uses natural water samples and the values given above are indicative, based on the range of waters used in the past.

**Sample 1S**

**Supplied as:**

**Major Inorganic Components (in Soft Water)**

2 x 1L soft water sample  
 1 x 30mL kjeldahl nitrogen spiking solution  
 1 x 30mL total phosphorus spiking solution

Analyte	AV	Range	SDPA % (fixed)	Units	DP
Calcium	RMean	6-40	7.5 (1)	mgCa/L	2
Magnesium	RMean	0.5-10	7.5 (0.25)	mgMg/L	2
Total Hardness	RMean	6-50	10 (1.2)	mgCa/L	1
Alkalinity	RMean	10-90	10 (1.5)	mgHCO <sub>3</sub> /L	1
Potassium	RMean	0.3-4	7.5 (0.2)	mgK/L	3
Sodium	RMean	5-30	7.5 (0.5)	mgNa/L	2
Chloride	RMean	5-45	7.5 (1)	mgCl/L	2
Sulfate	RMean	3-70	7.5 (1)	mgSO <sub>4</sub> /L	2
Fluoride	RMean	1800	7.5 (75)	µgF/L	0
Conductivity (20°C)	RMean	70-300	7.5 (5)	µS/cm	1
Kjeldahl Nitrogen	Formulation	1-5	10 (0.1)	mgN/L	2
Total Phosphorus	RMean	0.5-2.6	10 (0.025)	mgP/L	2
Barium	RMean	10-120	10 (4)	µgBa/L	1

This sample uses natural water samples and the values given above are indicative, based on the range of waters used in the past.

**Sample 1A**  
**Supplied as:**

**Major Ions in Higher Salinity Potable Water**

1 x 1L spiked matrix water sample  
 1 x 30mL TOC spiking solution  
 1 x 500mL pH sample

Analyte	AV	Range (Max)	SDPA % (fixed)	Units	DP
Sodium	Formulation	50-300	7.5 (0.5)	mgNa/L	0
Magnesium	Formulation	10-60	7.5 (0.25)	mgMg/L	1
Chloride	Formulation	60-300	7.5 (1)	mgCl/L	0
Sulfate	Formulation	60-350	7.5 (1)	mgSO4/L	0
pH at 20-25°C	RMean	4-10	(0.1)	-	2
Conductivity (20°C)	RMean	(3000)	7.5	µS/cm	0
Total organic carbon (TOC)	RMean	1-10	10 (0.25)	mgC/L	2
Total Dissolved Solids	RMean	(2000)	7.5 (10)	mg/L	0

**Sample 2H**  
**Supplied as:**

**Nutrients and Others (in Hard Water)**

1 x 1L hard water sample  
 7 x 30mL spiking solutions for nitrite, ammonia, soluble reactive phosphorus, colour, permanganate index, total cyanide and free cyanide)  
 1 x 500mL pH/conductivity sample

Analyte	AV	Range (Max)	SDPA % (fixed)	Units	DP
Total oxidised nitrogen (TON)	RMean	5-40	10 (0.1)	mgNO3/L	2
Silicate	RMean	2-10	7.5 (0.1)	mgSiO2/L	2
Nitrite	Formulation	0.05-0.35	7.5 (0.005)	mgNO2/L	3
Ammonia	RMean	0.1-0.6	10 (0.025)	mgNH4 /L	3
Soluble reactive phosphorus (PO <sub>4</sub> )	RMean	500-2600	7.5 (10)	µgP/L	0
pH at 20-25°C	RMean	4-10	(0.1)	-	2
Conductivity (20°C)	RMean	100-800	7.5	µS/cm	0
Colour	Formulation	4-24	10 (1)	Hazen	2
Permanganate index (PI)	Formulation	1-6	10 (0.25)	mgO2/L	2
Total Cyanide	Formulation	10-60	10 (2.5)	µgCN/L	1
Free Cyanide	Formulation	10-60	10 (2.5)	µgCN/L	1
Nitrate	RMean	3-40	7.5 (0.1)	mgNO3/L	2
Total Dissolved Solids	RMean	(500)	10 (10)	mg/L	1

This sample uses natural water samples and the values given above are indicative, based on the range of waters used in the past.



**Sample 2S**

**Nutrients and Others (in Soft Water)**

**Supplied as:**

1 x 1L soft water sample  
 8 x 30mL spiking solutions for nitrite, nitrate, ammonia, soluble reactive phosphorus, colour, permanganate index, total cyanide and free cyanide)  
 1 x 500mL pH/conductivity sample

Analyte	AV	Range (Max)	SDPA % (fixed)	Units	DP
Total oxidised nitrogen (TON)	RMean	0.2-10	10 (0.1)	mgNO <sub>3</sub> /L	2
Silicate	RMean	2-12	7.5 (0.1)	mgSiO <sub>2</sub> /L	2
Nitrite	Formulation	0.05-0.35	7.5 (0.005)	mgNO <sub>2</sub> /L	3
Ammonia	RMean	0.1-0.6	10 (0.025)	mgNH <sub>4</sub> /L	3
Soluble reactive phosphorus (PO <sub>4</sub> )	RMean	500-2600	7.5 (50)	µgP/L	0
pH at 20-25°C	RMean	4-10	(0.1)	-	2
Conductivity (20°C)	RMean	100-800	7.5	µS/cm	0
Colour	Formulation	4-24	10 (1)	Hazen	2
Permanganate index (PI)	Formulation	1-6	10 (0.25)	mgO <sub>2</sub> /L	2
Total Cyanide	Formulation	10-60	10 (2.5)	µgCN/L	1
Free Cyanide	Formulation	10-60	10 (2.5)	µgCN/L	1
Nitrate	Formulation	1-30	7.5 (0.1)	mgNO <sub>3</sub> /L	2
Total Dissolved Solids	RMean	(300)	10 (10)	mg/L	1

This sample uses natural water samples and the values given above are indicative, based on the range of waters used in the past.

**Sample 2A**

**pH in Poorly Buffered Waters**

**Supplied as:**

2 x 500mL pH samples

Analyte	AV	Range	SDPA % (fixed)	Units	DP
pH at 20-25°C – Low	RMean	3-5	(0.1)	-	2
pH at 20-25°C – High	RMean	6-9	(0.1)	-	2

**Sample 3**

**Non-Specific Analytes in Clean Water**

**Supplied as:**

7 x 30mL spiking solutions for BOD, COD, suspended solids, MBAS, non-ionic surfactants, turbidity and DOC

Analyte	AV	Range	SDPA % (fixed)	Units	DP
BOD (5 day)	Formulation	1-6	10 (0.3)	mgO <sub>2</sub> /L	2
COD	Formulation	50-250	7.5 (5)	mgO <sub>2</sub> /L	1
Suspended solids	RMean	5-30	10 (1)	mg/L	2
Methylene blue active substances (MBAS)	Formulation	45-240	10 (10)	µgLS/L	1
Non-ionic surfactants	Formulation	0.1-1	10	mg/L	2
Dissolved organic carbon	Formulation	1-5	10 (0.1)	mgC/L	2
Turbidity	RMean	1-8	7.5 (0.2)	NTU	2

**Sample 3A**

**Inorganic Disinfection By-products in Clean Water**

**Supplied as:** 4 x 30mL spiking solutions for bromide, bromate, chlorite and chlorate (high and low level spiking solutions)

Analyte	AV	Range	SDPA % (fixed)	Units	DP
Bromide	Formulation	20-100	10 (2.5)	µgBr/L	1
Bromate	Formulation	2-12	10 (0.5)	µgBrO3/L	2
Chlorate (low level)	Formulation	20-100	10 (2.5)	µgClO3/L	1
Chlorite (low level)	Formulation	20-100	10 (1.5)	µgClO2/L	1
Chlorate (high level)	Formulation	140-700	7.5	µgClO3/L	0
Chlorite (high level)	Formulation	140-700	7.5	µgClO2/L	0

**Sample 3B** **Free Chlorine In Clean Water**  
**Supplied as:** 1 x 500mL matrix water sample  
 1 x 10mL free chlorine spiking solution

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Free Chlorine	Formulation	0.5	10 (0.03)	mgCl2/L	3

**Sample 3C** **Total Chlorine in Clean Water**  
**Supplied as:** 1 x 500mL matrix water sample  
 1 x 10mL total chlorine spiking solution

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Total Chlorine	RMean	0.5	10 (0.03)	mgCl2/L	3

**Sample 4** **Metals in Surface Water (Preserved in 0.5% Nitric Acid)**  
**Supplied as:** 1 x 500mL metals sample containing all analytes except silver  
 1 x 30mL silver spiking solution

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Iron	RMean	350	7.5 (10)	µg/L	1
Manganese	RMean	60	7.5 (2)	µg/L	1
Copper	RMean	500	7.5 (5)	µg/L	0
Aluminium	RMean	300	7.5 (10)	µg/L	1
Zinc	RMean	500	7.5 (5)	µg/L	0
Silver	RMean	12	7.5 (0.4)	µg/L	2
Barium	RMean	600	7.5 (10)	µg/L	0
Boron	RMean	1200	7.5 (25)	µg/L	0
Strontium	RMean	1000	7.5 (10)	µg/L	0
Lithium	RMean	50	7.5 (2)	µg/L	1

This sample uses natural water samples and the values given above are indicative, based on the range of waters used in the past.

**Sample 4G**

**Supplied as:**

**Metals in Groundwater (Preserved in 0.5% Nitric Acid)**

1 x 500mL metals sample containing all analytes except silver

1 x 30mL silver spiking solution

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Iron	RMean	1000	7.5 (10)	µg/L	0
Manganese	RMean	100	7.5 (2.5)	µg/L	1
Copper	RMean	50	7.5 (1)	µg/L	1
Aluminium	RMean	100	10 (5)	µg/L	1
Zinc	RMean	150	10 (1)	µg/L	1
Silver	RMean	10	10 (0.4)	µg/L	2
Barium	RMean	500	7.5 (10)	µg/L	0
Boron	RMean	500	7.5 (10)	µg/L	0
Strontium	RMean	600	7.5 (10)	µg/L	0
Lithium	RMean	50	7.5 (2)	µg/L	1

This sample uses natural water samples and the values given above are indicative, based on the range of waters used in the past.

**Sample 5**

**Supplied as:**

**Toxic Metals in Surface Water (Preserved in 0.5% Nitric Acid)**

1 x 500mL metals sample containing all analytes except mercury and tin

2 x 30mL spiking solutions for mercury and tin

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Cadmium	RMean	6	7.5 (0.2)	µg/L	2
Lead	RMean	25	7.5 (0.5)	µg/L	1
Nickel	RMean	24	7.5 (0.8)	µg/L	1
Selenium	RMean	12	10 (0.5)	µg/L	2
Arsenic	RMean	12	10 (0.4)	µg/L	2
Antimony	RMean	6	10 (0.25)	µg/L	2
Mercury	RMean	1.2	10 (0.05)	µg/L	3
Cobalt	RMean	25	7.5 (1)	µg/L	1
Vanadium	RMean	25	7.5 (1)	µg/L	1
Chromium	RMean	60	7.5 (2)	µg/L	1
Molybdenum	RMean	25	7.5 (1)	µg/L	1
Tin	RMean	100	10 (1)	µg/L	1
Beryllium	RMean	5	7.5 (0.2)	µg/L	2

This sample uses natural water samples and the values given above are indicative, based on the range of waters used in the past.

**Sample 5A**  
**Supplied as:****Metals for Hydride Generation in Clean Water (Preserved in 0.5% Hydrochloric Acid)**  
1 x 500mL metals sample containing all analytes

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Arsenic	Formulation	12	10 (0.5)	µg/L	2
Selenium	Formulation	12	10 (0.4)	µg/L	2
Antimony	Formulation	6	10 (0.25)	µg/L	2
Tin	Formulation	100	10 (1)	µg/L	1

**Sample 5B**  
**Supplied as:****EQS Metals in Clean Water (Preserved in 0.5% Nitric Acid)**  
1 x 500mL metals sample containing all analytes except mercury  
1 x 30mL mercury spiking solution

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Cadmium	Formulation	1	10 (0.03)	µg/L	3
Copper	Formulation	7.5	10 (0.05)	µg/L	2
Total Chromium	Formulation	2.5	10 (0.1)	µg/L	2
Lead	Formulation	2.5	10 (0.1)	µg/L	2
Nickel	Formulation	12.5	10 (0.5)	µg/L	2
Zinc	Formulation	25	10 (0.5)	µg/L	2
Vanadium	Formulation	10	10 (0.25)	µg/L	2
Mercury	Formulation	0.5	10 (0.04)	µg/L	3

**Sample 5C**  
**Supplied as:****Chromium (VI) in Clean Water**  
1 x 30mL spiking solution

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Chromium (VI)	Formulation	20 (occasionally up to 200µg/L)	10 (0.5)	µg/L	2

**Sample 5G**

**Toxic Metals in Groundwater (Preserved in 0.5% Nitric Acid)**

**Supplied as:**

1 x 500mL metals sample containing all analytes except mercury and tin  
 1 x 30mL mercury spiking solution  
 1 x 30mL tin spiking solution

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Cadmium	RMean	5	7.5	µg/L	2
Lead	RMean	50	7.5	µg/L	1
Nickel	RMean	20	10	µg/L	1
Selenium	RMean	5	10 (0.3)	µg/L	2
Arsenic	RMean	10	7.5	µg/L	2
Antimony	RMean	5	10 (0.25)	µg/L	2
Mercury	RMean	5	10	µg/L	2
Cobalt	RMean	10	7.5	µg/L	2
Vanadium	RMean	10	7.5 (0.4)	µg/L	2
Chromium	RMean	25	7.5	µg/L	2
Molybdenum	RMean	25	7.5	µg/L	1
Tin	RMean	20	10 (0.8)	µg/L	1
Beryllium	RMean	10	7.5	µg/L	2

This sample uses natural water samples and the values given above are indicative, based on the range of waters used in the past.

**Sample 6A**

**Haloforms and Chlorinated Solvents in Clean Water**

**Supplied as:**

1 x 2L groundwater sample  
 1 x 10mL spiking solution

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Chloroform	Formulation	120	10 (2.5)	µg/L	1
Bromodichloromethane	Formulation	120	10 (2.5)	µg/L	1
Dibromochloromethane	Formulation	120	10 (2.5)	µg/L	1
Bromoform	Formulation	120	10 (2.5)	µg/L	1
Trichloroethene	Formulation	12	10 (0.5)	µg/L	2
Tetrachloroethene	Formulation	12	10 (0.5)	µg/L	2
Carbon Tetrachloride	Formulation	3.6	10 (0.15)	µg/L	2
1,2-Dichloroethane	Formulation	3.6	10 (0.15)	µg/L	2

**Sample 6B**

**Phenols in Clean Water**

**Supplied as:**

1 x 2L groundwater sample  
1 x 10mL spiking solution

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Phenol	Formulation	600	10 (25)	ng/L	0
2-Chlorophenol	Formulation	600	10 (25)	ng/L	0
4-Chlorophenol	Formulation	600	10 (25)	ng/L	0
3-Bromophenol*	Formulation	600	10 (25)	ng/L	0
2,4-Dichlorophenol	Formulation	600	10 (25)	ng/L	0
2,4,6-Trichlorophenol	Formulation	600	10 (25)	ng/L	0
Pentachlorophenol	Formulation	600	10 (25)	ng/L	0
2,5-Dimethylphenol*	Formulation	600	10 (25)	ng/L	0
3,5-Dimethylphenol*	Formulation	600	10 (25)	ng/L	0
2-Methylphenol (o-cresol)*	Formulation	600	10 (25)	ng/L	0
3-Methylphenol (m-cresol)*	Formulation	600	10 (25)	ng/L	0
4-Methylphenol (p-cresol)*	Formulation	600	10 (25)	ng/L	0
Total monosubstituted methylphenols*	Formulation	1800	10 (75)	ng/L	0

\*analytes marked with an asterisk are not included in LGC's UKAS scope of accreditation

**Sample 6C**

**Benzene, Toluene and Xylenes in Clean Water**

**Supplied as:**

1 x 2L groundwater sample  
1 x 10mL spiking solution

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Benzene	Formulation	1.2	10 (0.05)	µg/L	3
Toluene	Formulation	3	10 (0.05)	µg/L	2
Ethylbenzene	Formulation	3	10 (0.05)	µg/L	2
Styrene	Formulation	3	10 (0.05)	µg/L	2
o-Xylene	Formulation	3	10 (0.05)	µg/L	2
m-Xylene	Formulation	3	10 (0.05)	µg/L	2
p-Xylene	Formulation	3	10 (0.05)	µg/L	2
Total xylene	Formulation	9	10 (0.15)	µg/L	2
m-+ p-Xylene	Formulation	6	10 (0.1)	µg/L	2
1,2,4-trimethylbenzene*	Formulation	10	10 (0.15)	µg/L	2
MTBE (methyl tert-butyl ether)	Formulation	10	10 (0.15)	µg/L	2

\*analytes marked with an asterisk are not included in the LGC's UKAS scope of accreditation

**Sample 7A****Supplied as:****Organochlorine Pesticides in Clean Water**

1 x 2L groundwater sample

2 x 10mL spiking solution

*Spiking solution 7A(1)*

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Endrin	Formulation	120	10 (5)	ng/L	1
Dieldrin	Formulation	50	10 (1.5)	ng/L	1
Aldrin	Formulation	50	10 (1.5)	ng/L	1
p,p'-DDT	Formulation	120	10 (5)	ng/L	1
o,p'-DDT	Formulation	120	10 (5)	ng/L	1
p,p'-DDE	Formulation	120	10 (5)	ng/L	1
o,p'-DDE*	Formulation	120	10 (5)	ng/L	1
p,p'-DDD	Formulation	120	10 (5)	ng/L	1
o,p'-DDD (TDE)*	Formulation	120	10 (5)	ng/L	1
Alpha Hexachlorocyclohexane	Formulation	120	10 (5)	ng/L	1
Beta Hexachlorocyclohexane	Formulation	120	10 (5)	ng/L	1
Delta Hexachlorocyclohexane	Formulation	120	10 (5)	ng/L	1
Lindane (Gamma HCH)	Formulation	120	10 (5)	ng/L	1
Trifluralin	Formulation	120	10 (5)	ng/L	1
Alpha Endosulphan	Formulation	120	10 (5)	ng/L	1
Beta Endosulphan	Formulation	120	10 (5)	ng/L	1
Hexachlorobenzene	Formulation	120	10 (5)	ng/L	1
Heptachlor	Formulation	50	10 (1.5)	ng/L	1
Heptachlor epoxide	Formulation	50	10 (1.5)	ng/L	1
Pentachlorobenzene	Formulation	120	10 (5)	ng/L	1
Pendimethalin*	Formulation	120	10 (5)	ng/L	1

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*Spiking solution 7A(2)*

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Cis-chlordane*	Formulation	120	10 (5)	ng/L	1
Trans-chlordane*	Formulation	120	10 (5)	ng/L	1
Methoxychlor*	Formulation	120	10 (5)	ng/L	1

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**Sample 7B**

**Chlorinated Solvents in Clean Water**

**Supplied as:**

1 x 2L groundwater sample

1 x 10mL spiking solution

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Hexachlorobutadiene	Formulation	120	10 (6)	ng/L	1
Carbon Tetrachloride	Formulation	400	10 (25)	ng/L	0
Tetrachloroethene	Formulation	400	10 (25)	ng/L	0
1,2,4-Trichlorobenzene	Formulation	120	10 (6)	ng/L	1
Trichloroethene	Formulation	400	10 (25)	ng/L	0
1,1,1-Trichloroethane	Formulation	400	10 (25)	ng/L	0
1,3,5-Trichlorobenzene	Formulation	120	10 (6)	ng/L	1
1,2,3-Trichlorobenzene	Formulation	120	10 (6)	ng/L	1
1,2-Dichloroethane	Formulation	400	10 (25)	ng/L	0
Chloroform	Formulation	400	10 (25)	ng/L	0

**Sample 7C**

**Polycyclic Aromatic Hydrocarbons (2 Spikes) in Clean Water**

**Supplied as:**

1 x 2L groundwater sample

2 x 10mL spiking solutions

*Spiking solution 7C(1)*

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Fluoranthene	Formulation	50	10 (2)	ng/L	1
Benzo(b)fluoranthene	Formulation	25	10 (2)	ng/L	2
Benzo(k)fluoranthene	Formulation	25	10 (2)	ng/L	2
Benz(a)pyrene	Formulation	12	10 (0.5)	ng/L	2
Benzo(ghi)perylene	Formulation	25	10 (2)	ng/L	2
Indeno(1,2,3-cd)pyrene	Formulation	25	10 (2)	ng/L	2

*Spiking solution 7C(2)*

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Acenaphthene	Formulation	25	10 (2)	ng/L	2
Acenaphthylene	Formulation	25	10 (2)	ng/L	2
Anthracene	Formulation	25	10 (2)	ng/L	2
Benz(a)anthracene	Formulation	25	10 (2)	ng/L	2
Chrysene	Formulation	25	10 (2)	ng/L	2
Dibenz(ah)anthracene	Formulation	25	10 (2)	ng/L	2
Fluorene	Formulation	25	10 (2)	ng/L	2
Naphthalene	Formulation	25	10 (2)	ng/L	2
Perylene	Formulation	25	10 (2)	ng/L	2
Phenanthrene	Formulation	25	10 (2)	ng/L	2
Pyrene	Formulation	25	10 (2)	ng/L	2



**Sample 7D****Supplied as:****Polychlorinated Biphenyls in Clean Water**

1 x 2L groundwater sample

1 x 10mL spiking solution

Analyte	AV	Max	SDPA % (fixed)	Units	DP
PCB (28)	Formulation	100	10 (1)	ng/L	1
PCB (52)	Formulation	100	10 (1)	ng/L	1
PCB (101)	Formulation	100	10 (1)	ng/L	1
PCB (118)	Formulation	100	10 (1)	ng/L	1
PCB (138)	Formulation	100	10 (1)	ng/L	1
PCB (153)	Formulation	100	10 (1)	ng/L	1
PCB (180)	Formulation	100	10 (1)	ng/L	1

**Sample 8****Supplied as:****Acid Herbicides in Clean Water**

1 x 2L groundwater sample

3 x 10mL spiking solutions

*Spiking solution 8(1)*

Analyte	AV	Max	SDPA % (fixed)	Units	DP
2,4,5-T*	Formulation	120	10 (5)	ng/L	1
2,4,5-TP (Fenoprop)*	Formulation	120	10 (5)	ng/L	1
2,4-D	Formulation	120	10 (5)	ng/L	1
2,4-DB	Formulation	120	10 (5)	ng/L	1
Dicamba	Formulation	120	10 (5)	ng/L	1
2,3,6-TBA*	Formulation	120	10 (5)	ng/L	1
Picloram*	Formulation	120	10 (5)	ng/L	1
Clopyralid*	Formulation	120	10 (5)	ng/L	1
Fluroxypyr*	Formulation	120	10 (5)	ng/L	1
Benazolin*	Formulation	120	10 (5)	ng/L	1
Mecoprop	Formulation	120	10 (5)	ng/L	1
Dichlorprop	Formulation	120	10 (5)	ng/L	1
Quinmerac*	Formulation	120	10 (5)	ng/L	1
MCPA	Formulation	120	10 (5)	ng/L	1
MCPB	Formulation	120	10 (5)	ng/L	1
Triclopyr	Formulation	120	10 (5)	ng/L	1

\*analytes marked with an asterisk are not included in the LGC's UKAS scope of accreditation

*Spiking solution 8(2)*

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Bentazone	Formulation	120	10 (5)	ng/L	1
Bromoxynil	Formulation	120	10 (5)	ng/L	1
Dichlobenil*	Formulation	120	10 (5)	ng/L	1
Ioxynil	Formulation	120	10 (5)	ng/L	1
Metaldehyde	Formulation	120	10 (5)	ng/L	1
Alachlor*	Formulation	120	10 (5)	ng/L	1
Metazachlor*	Formulation	120	10 (5)	ng/L	1
Propachlor*	Formulation	120	10 (5)	ng/L	1
S-metolachlor*	Formulation	120	10 (5)	ng/L	1
Flufenacet*	Formulation	120	10 (5)	ng/L	1
Propyzamide	Formulation	120	10 (5)	ng/L	1
Asulam*	Formulation	120	10 (5)	ng/L	1
Chloridazon*	Formulation	120	10 (5)	ng/L	1
Napropamide*	Formulation	120	10 (5)	ng/L	1

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*Spiking solution 8(3)*

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Glyphosate	Formulation	120	10 (5)	ng/L	1
AMPA	Formulation	120	10 (5)	ng/L	1

**Sample 8B**

**Supplied as:**

**Triazines and Urea Herbicides in Clean Water**

1 x 2L groundwater sample  
2 x 10mL spiking solutions

*Spiking solution 8B(1)*

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Isoproturon	Formulation	120	10 (5)	ng/L	1
Diuron	Formulation	120	10 (5)	ng/L	1
Linuron	Formulation	120	10 (5)	ng/L	1
Chlortoluron	Formulation	120	10 (5)	ng/L	1
Monuron	Formulation	120	10 (5)	ng/L	1
Chloroxuron*	Formulation	120	10 (5)	ng/L	1
Metoxuron*	Formulation	120	10 (5)	ng/L	1
Monolinuron *	Formulation	120	10 (5)	ng/L	1
Methabenzthiazuron*	Formulation	120	10 (5)	ng/L	1
Iodosulfuron methyl*	Formulation	120	10 (5)	ng/L	1
Mesosulfuron methyl*	Formulation	120	10 (5)	ng/L	1
Metsulfuron methyl*	Formulation	120	10 (5)	ng/L	1
Thifensulfuron methyl*	Formulation	120	10 (5)	ng/L	1

Aquacheck Scheme Description

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Tribenuron methyl*	Formulation	120	10 (5)	ng/L	1
Diflufenican*	Formulation	120	10 (5)	ng/L	1
Bromacil*	Formulation	120	10 (5)	ng/L	1

*Spiking solution 8B(2)*

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Simazine	Formulation	120	10 (5)	ng/L	1
Atrazine	Formulation	120	10 (5)	ng/L	1
Propazine	Formulation	120	10 (5)	ng/L	1
Cyanazine*	Formulation	120	10 (5)	ng/L	1
Trietazine*	Formulation	120	10 (5)	ng/L	1
Prometryn*	Formulation	120	10 (5)	ng/L	1
Terbutryn*	Formulation	120	10 (5)	ng/L	1
Ametryn*	Formulation	120	10 (5)	ng/L	1
Desethylatrazine*	Formulation	120	10 (5)	ng/L	1
Desisopropylatrazine*	Formulation	120	10 (5)	ng/L	1
Terbutylazine*	Formulation	120	10 (5)	ng/L	1
Cyromazine*	Formulation	120	10 (5)	ng/L	1
Carbetamide*	Formulation	120	10 (5)	ng/L	1
Pirimicarb*	Formulation	120	10 (5)	ng/L	1
Carbofuran*	Formulation	120	10 (5)	ng/L	1
Methiocarb*	Formulation	120	10 (5)	ng/L	1
Prosulfocarb*	Formulation	120	10 (5)	ng/L	1
Metamitron*	Formulation	120	10 (5)	ng/L	1
Metribuzin*	Formulation	120	10 (5)	ng/L	1
Florasulam*	Formulation	120	10 (5)	ng/L	1

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**Sample 9****Supplied as:****Organophosphorus Pesticides in Clean Water**

1 x 2L groundwater sample

1 x 10mL spiking solution

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Azinphos-methyl	Formulation	120	10 (5)	ng/L	1
Azinphos-ethyl	Formulation	120	10 (5)	ng/L	1
Dichlorvos	Formulation	120	10 (5)	ng/L	1
Fenitrothion	Formulation	120	10 (5)	ng/L	1
Malathion	Formulation	120	10 (5)	ng/L	1
Mevinphos	Formulation	120	10 (5)	ng/L	1
Chlorfenvinphos	Formulation	120	10 (5)	ng/L	1
Diazinon	Formulation	120	10 (5)	ng/L	1
Fenthion	Formulation	120	10 (5)	ng/L	1
Parathion-ethyl	Formulation	120	10 (5)	ng/L	1
Parathion-methyl	Formulation	120	10 (5)	ng/L	1
Chlorpyrifos	Formulation	120	10 (5)	ng/L	1
Cypermethrin	Formulation	120	10 (5)	ng/L	1
Propetamphos*	Formulation	120	10 (5)	ng/L	1
Dimethoate*	Formulation	120	10 (5)	ng/L	1

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**Sample 10****Supplied as:****Nutrients and other analytes in Wastewater**

6 x 30mL spiking solutions for nitrate, nitrite and ammonia, silicate, soluble reactive phosphorus and chloride, total cyanide, free cyanide, kjeldahl nitrogen and total phosphorus

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Total oxidised nitrogen (TON)	Formulation	10	10 (0.25)	mgN/L	2
Nitrate	Formulation	7.5	7.5 (0.25)	mgN/L	2
Nitrite	Formulation	2.5	7.5 (0.05)	mgN/L	2
Ammonia	Formulation	20	7.5 (0.25)	mgN/L	2
Silicate	Formulation	25	7.5 (0.25)	mgSiO <sub>2</sub> /L	1
Soluble Reactive Phosphorus (PO <sub>4</sub> )	Formulation	10	7.5 (0.25)	mgP/L	2
Chloride	Formulation	500	7.5 (10)	mgCl/L	0
Total Cyanide	Formulation	2.5	10 (0.05)	mgCN/L	2
Kjeldahl Nitrogen	Formulation	25	10 (0.25)	mgN/L	1
Free Cyanide	Formulation	2.5	10 (0.05)	mgCN/L	2
Total Nitrogen	Formulation	55	10 (0.5)	mgN/L	1
Total Phosphorus	Formulation	20	7.5 (0.05)	mgP/L	1

**Sample 11**

**Supplied as:**

**Non-Specific Analytes in Wastewater**

6 x 30mL spiking solutions for BOD, COD, MBAS, D/TOC, suspended solids and non-ionic surfactants  
1 x 125mL sample for turbidity analysis

Analyte	AV	Range	SDPA % (fixed)	Units	DP
BOD (5 day)	Formulation	40-200	10 (4)	mgO <sub>2</sub> /L	1
COD	Formulation	50-250	7.5 (5)	mgO <sub>2</sub> /L	1
Suspended solids	RMean	10-50	10 (1)	mg/L	1
Methylene blue active substances (MBAS)	Formulation	15-75	10 (1)	mgLS/L	1
Dissolved/Total organic carbon	Formulation	50-250	7.5 (5)	mgC/L	1
Turbidity	RMean	10-50	10	NTU	1
Non-ionic surfactants	Formulation	10-50	10	mg/L	2

**Sample 12**

**Supplied as:**

**Metals in Wastewater (Preserved in 0.5% Nitric Acid)**

1 x 250mL concentrated synthetic effluent sample  
1 x 125mL metals sample containing all analytes except mercury  
1 x 30mL mercury spiking solution

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Antimony*	Formulation	5	10 (0.2)	µg/L	2
Arsenic	Formulation	50	10 (2)	µg/L	1
Aluminium	Formulation	2.5	7.5 (0.05)	mg/L	2
Chromium	Formulation	0.25	7.5 (0.01)	mg/L	3
Beryllium*	Formulation	2.5	7.5 (0.05)	mg/L	2
Iron	Formulation	5	7.5 (0.1)	mg/L	2
Manganese	Formulation	2.5	7.5 (0.05)	mg/L	2
Cadmium	Formulation	50	7.5 (1)	µg/L	1
Copper	Formulation	0.25	7.5 (0.01)	mg/L	3
Lead	Formulation	0.25	7.5 (0.01)	mg/L	3
Nickel	Formulation	1	7.5 (0.02)	mg/L	3
Zinc	Formulation	5	7.5 (0.1)	mg/L	2
Mercury	Formulation	25	10 (0.5)	µg/L	1
Selenium	Formulation	50	10 (2.5)	µg/L	1
Molybdenum	Formulation	1	7.5 (0.02)	mg/L	3
Tellurium*	Formulation	5	10 (0.05)	µg/L	3
Uranium*	Formulation	1	10 (0.05)	µg/L	3

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**Sample 12C**

**Chromium (VI) in Wastewater**

**Supplied as:**

1 x 500mL synthetic waste water sample  
1 x 30mL chromium (VI) spiking solution

Analyte	AV	Range	SDPA % (fixed)	Units	DP
Chromium (VI)	Formulation	40-200	10 (5)	µg/L	1

**Sample 13**

**Sewage Sludge Inorganics and Specific Elements**

**Supplied as:**

1 x 20g sludge sample

Analyte	AV	Likely Range	SDPA % (fixed)	Units	DP
Arsenic	RMean	0.3-15	10 (0.25)	mg/kg	2
Cadmium	RMean	0.1-10	10 (0.1)	mg/kg	2
Chromium	RMean	50-400	10 (5)	mg/kg	1
Copper	RMean	10-450	10 (10)	mg/kg	0
Lead	RMean	1-150	10 (5)	mg/kg	1
Mercury	RMean	0.03-3	10 (0.05)	mg/kg	2
Molybdenum	RMean	0.1-10	10 (0.5)	mg/kg	2
Nickel	RMean	1-100	10 (2)	mg/kg	1
Vanadium	RMean	1-40	10 (1)	mg/kg	2
Zinc	RMean	50-1500	10 (20)	mg/kg	0
Selenium	RMean	0.1-2	10 (0.15)	mg/kg	2
Total boron	RMean	10-60	10 (1)	mg/kg	1
Fluoride	RMean	10-1000	10 (12.5)	mg/kg	0
Total nitrogen	RMean	1-8	10 (0.25)	% N	2
Total phosphorus	RMean	0.1-3	10 (0.05)	% P	2
Total potassium	RMean	0.1-5	10 (0.05)	% K	3
Cobalt	RMean	0.2-20	10 (0.5)	mg/kg	1
Iron	RMean	1000-100000	10	mg/kg	0
Manganese	RMean	50-1000	10	mg/kg	0

Sample 13 uses natural sludge samples from different sources. The figures given above provide an indication of the concentrations that may be supplied; these values are accumulated from a range of recent samples provided within the Aquacheck scheme.

**Sample 14**  
**Supplied as:****Agricultural Soil Inorganics and Specific Elements**

1 x 100g soil sample

Analyte	AV	Likely Max	SDPA % (fixed)	Units	DP
Arsenic	RMean	20	10 (0.5)	mg/kg	2
Cadmium	RMean	1	10 (0.05)	mg/kg	3
Chromium	RMean	100	10 (5)	mg/kg	1
Copper	RMean	40	10 (1.5)	mg/kg	2
Lead	RMean	50	10 (2)	mg/kg	1
Mercury	RMean	0.5	10 (0.025)	mg/kg	3
Molybdenum	RMean	4	10 (0.1)	mg/kg	3
Nickel	RMean	40	10 (1.5)	mg/kg	2
Vanadium	RMean	100	10 (2.5)	mg/kg	1
Zinc	RMean	150	10 (5)	mg/kg	1
Selenium	RMean	1	10 (0.1)	mg/kg	3
Total boron	RMean	100	10	mg/kg	2
Water extractable boron	RMean	10	10 (1)	mg/kg	2
Fluoride	RMean	100	10 (25)	mg/kg	1
Total nitrogen	RMean	4000	10	mg/kg	0
Total phosphorus	RMean	1000	10 (10)	mg/kg	0
Total potassium	RMean	6000	10	mg/kg	0
Cobalt	RMean	20	10 (0.5)	mg/kg	2
Iron	RMean	30,000	10	mg/kg	0
Manganese	RMean	1000	10	mg/kg	0
Total solids	RMean	100	(0.5)	%	1
Loss on ignition	RMean	20	10	%	2
pH at 20-25°C	RMean	10	(0.2)	-	2
Extractable phosphorus	RMean	50	10 (5)	mg/kg	1
Extraction of potassium	RMean	250	10 (5)	mg/kg	1
Extraction of magnesium	RMean	500	10 (5)	mg/kg	1
Extraction of sodium	RMean	200	10 (5)	mg/kg	1
Organic carbon content	RMean	10	20 (0.5)	%	2
Conductivity	RMean	1500	10 (2.5)	uS/cm	0
Carbonate content	RMean	100,000	10 (3)	mg/kg	2

Sample 14 uses natural soil samples which are from different sources and of different soil types. The figures given above provide an indication of the concentrations that may be supplied; these values are accumulated from a range of recent samples provided within the Aquacheck scheme.

**Sample 15****Settleable Solids in Wastewater****Supplied as:**

1 x 1L settleable solids sample

Analyte	AV	Range	SDPA %	Units	DP
Settleable solids	RMean	20-100	20	mL/L	2

**Sample 16****Compositional Analysis of Sewage Sludge****Supplied as:**

1 x 50g real sewage sludge sample

Analyte	AV	Likely Max	SDPA % (fixed)	Units	DP
Total Solids (105±5°C)	RMean	50	5 (0.5)	%	2
Loss on ignition (500±5°C)	RMean	60	5 (0.5)	%	2
pH at 20-25°C	RMean	10	(0.2)	-	2
Calcium	RMean	60000	10 (250)	mg/kg dried weight	0
Magnesium	RMean	10000	10 (7.5)	mg/kg dried weight	0
Ammoniacal Nitrogen*	RMean	10000	Robust SD	mg/kg dried weight	0

\*analytes marked with an asterisk are not included in the LGC's UKAS scope of accreditation

Sample 16 uses natural sludge samples from different sources. The range figures given above provide an indication of the concentrations that may be supplied; they are values from a range of recent samples provided within the Aquacheck scheme.

**Sample 17A****Major Wastewater Analytes****Supplied as:**

1 x 1L sample

Analyte	AV	Range	SDPA % (fixed)	Units	DP
pH at 20-25°C	RMean	3-10	(0.1)	-	2
Settled chemical oxygen demand (COD)	RMean	200-1000	10 (10)	mgO <sub>2</sub> /L	0
Total COD	Formulation	400-2100	7.5 (10)	mgO <sub>2</sub> /L	0
Suspended Solids	RMean	200-1000	7.5 (10)	mg/L	0
Conductivity (20°C)	RMean	0.5-45	7.5	mS/cm	2
Total dissolved solids	RMean	0.3-30	7.5 (0.05)	g/L	2
Non filterable COD	RMean	200-1000	10 (10)	mgO <sub>2</sub> /L	0
Salinity	RMean	0.5-30	Robust SD	-	2



**Sample 17B**

**Supplied as:**

**Total Phenol, Cyanide and Sulfate in Wastewater**

- 1 x 125mL phenol sample
- 1 x 125mL sulfate sample
- 1 x 125mL cyanide sample

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Total Phenol	Formulation	50	10 (0.05)	mg/L	1
Cyanide	Formulation	25	10 (0.05)	mgCN/L	2
Sulfate	Formulation	1000	7.5 (25)	mgSO <sub>4</sub> /L	0

**Sample 17C**

**Supplied as:**

**Metals in Wastewater (Preserved in 0.5% Nitric Acid)**

- 1 x 250mL metals sample containing all analytes except mercury, tin and silver
- 1 x 30mL mercury spiking solution
- 1 x 30mL tin spiking solution
- 1 x 30mL silver spiking solution

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Aluminium	Formulation	10	7.5 (0.025)	mg/L	2
Antimony	Formulation	0.5	10 (0.025)	mg/L	3
Arsenic	Formulation	0.5	10 (0.025)	mg/L	3
Barium	Formulation	10	7.5 (0.025)	mg/L	2
Boron	Formulation	50	7.5 (0.5)	mg/L	1
Beryllium*	Formulation	10	7.5 (0.025)	mg/L	2
Cadmium	Formulation	250	7.5 (0.25)	µg/L	0
Chromium	Formulation	5	7.5 (0.0125)	mg/L	2
Cobalt	Formulation	5	7.5 (0.0125)	mg/L	2
Copper	Formulation	5	7.5 (0.0125)	mg/L	2
Iron	Formulation	10	7.5 (0.025)	mg/L	2
Lead	Formulation	5	7.5 (0.0125)	mg/L	2
Manganese	Formulation	5	7.5 (0.0125)	mg/L	2
Molybdenum	Formulation	5	7.5 (0.0125)	mg/L	2
Mercury	Formulation	25	10 (0.5)	µg/L	1
Nickel	Formulation	5	7.5 (0.0125)	mg/L	2
Selenium	Formulation	0.5	10 (0.025)	mg/L	3
Silver	Formulation	0.5	7.5 (0.005)	mg/L	3
Tin	Formulation	0.5	10 (0.025)	mg/L	3
Vanadium	Formulation	5	7.5 (0.0125)	mg/L	2
Zinc	Formulation	5	7.5 (0.0125)	mg/L	2

\*analytes marked with an asterisk are not included in the LGC's UKAS scope of accreditation

**Sample 17D****Supplied as:****Ammonia, Phosphate and Nitrogen in Wastewater**

1 x 125mL ammonia and soluble reactive phosphorus sample

1 x 125mL total phosphorus sample

1 x 125mL total nitrogen sample

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Ammonia	Formulation	25	7.5 (0.25)	mgN/L	1
Soluble Reactive Phosphorus (PO <sub>4</sub> )	Formulation	125	7.5 (2.5)	mgP/L	1
Total Phosphorus	Formulation	125	7.5 (2.5)	mgP/L	1
Total Nitrogen	Formulation	125	10 (2.5)	mgN/L	1

**Sample 18A****Supplied as:****Haloforms and Chlorinated Solvents in Wastewater**

1 x 500mL concentrated synthetic effluent sample

1 x 10mL spiking solution

Analyte	AV	Max	SDPA %	Units	DP
Chloroform	Formulation	1200	10	µg/L	0
Bromodichloromethane	Formulation	1200	10	µg/L	0
Dibromochloromethane	Formulation	1200	10	µg/L	0
Bromoform	Formulation	1200	10	µg/L	0
Trichloroethene	Formulation	120	15	µg/L	1
Tetrachloroethene	Formulation	120	15	µg/L	1
Carbon Tetrachloride	Formulation	36	15	µg/L	1
1,2-Dichloroethane	Formulation	36	15	µg/L	1

**Sample 18B****Supplied as:****Phenols in Wastewater**

1 x 500mL concentrated synthetic effluent sample

1 x 10mL spiking solution

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Phenol	Formulation	6000	10 (50)	ng/L	0
2-Chlorophenol	Formulation	6000	10 (50)	ng/L	0
4-Chlorophenol	Formulation	6000	10 (50)	ng/L	0
3-Bromophenol*	Formulation	6000	10 (50)	ng/L	0
2,4-Dichlorophenol	Formulation	6000	10 (50)	ng/L	0
2,4,6-Trichlorophenol	Formulation	6000	10 (50)	ng/L	0
Pentachlorophenol	Formulation	6000	10 (50)	ng/L	0
2,5-Dimethylphenol*	Formulation	6000	10 (50)	ng/L	0
3,5-Dimethylphenol*	Formulation	6000	10 (50)	ng/L	0
2-Methylphenol (o-cresol)*	Formulation	6000	10 (50)	ng/L	0
3-Methylphenol (m-cresol)*	Formulation	6000	10 (50)	ng/L	0
4-Methylphenol (p-cresol)*	Formulation	6000	10 (50)	ng/L	0

Aquacheck Scheme Description

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Total monosubstituted methylphenols*	Formulation	18000	10 (150)	ng/L	0

\*analytes marked with an asterisk are not included in the LGC's UKAS scope of accreditation

**Sample 18C**                      **Benzene, Toluene and Xylenes in Wastewater**  
**Supplied as:**                1 x 500mL concentrated synthetic effluent sample  
    1 x 10mL spiking solution

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Benzene	Formulation	24	10 (1)	µg/L	2
Toluene	Formulation	60	10 (3)	µg/L	1
Ethylbenzene	Formulation	60	10 (3)	µg/L	1
Styrene	Formulation	60	10 (3)	µg/L	1
o-Xylene	Formulation	60	10 (3)	µg/L	1
m-Xylene	Formulation	60	10 (3)	µg/L	1
p-Xylene	Formulation	60	10 (3)	µg/L	1
Total xylene	Formulation	180	10 (9)	µg/L	1
m-+ p-Xylene	Formulation	120	10 (6)	µg/L	1

**Sample 19A**                      **Organochlorine Pesticides in Wastewater**  
**Supplied as:**                1 x 500mL concentrated synthetic effluent sample  
    2 x 10mL spiking solution

*Spiking solution 19A(1)*

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Endrin	Formulation	1200	10 (50)	ng/L	0
Dieldrin	Formulation	500	10 (25)	ng/L	0
Aldrin	Formulation	500	10 (25)	ng/L	0
p,p'-DDT	Formulation	1200	10 (50)	ng/L	0
o,p-DDT	Formulation	1200	10 (50)	ng/L	0
p,p'-DDE	Formulation	1200	10 (50)	ng/L	0
o,p'-DDE*	Formulation	1200	10 (50)	ng/L	0
p,p'-DDD	Formulation	1200	10 (50)	ng/L	0
o,p'-DDD (TDE)*	Formulation	1200	10 (50)	ng/L	0
Alpha Hexachlorocyclohexane (HCH)	Formulation	1200	10 (50)	ng/L	0
Beta Hexachlorocyclohexane (HCH)	Formulation	1200	10 (50)	ng/L	0
Delta Hexachlorocyclohexane (HCH)	Formulation	1200	10 (50)	ng/L	0
Lindane (Gamma HCH)	Formulation	1200	10 (50)	ng/L	0
Trifluralin	Formulation	1200	10 (50)	ng/L	0
Alpha endosulphan	Formulation	1200	10 (50)	ng/L	0
Beta endosulphan	Formulation	1200	10 (50)	ng/L	0
Hexachlorobenzene	Formulation	1200	10 (50)	ng/L	0

Aquacheck Scheme Description

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Heptachlor	Formulation	500	10 (25)	ng/L	0
Heptachlor epoxide	Formulation	500	10 (25)	ng/L	0
Pentachlorobenzene	Formulation	1200	10 (50)	ng/L	0
Pendimethalin*	Formulation	1200	10 (50)	ng/L	0

\*analytes marked with an asterisk are not included in the LGC's UKAS scope of accreditation

*Spiking solution 19A(2)*

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Cis-chlordane*	Formulation	1200	10 (50)	ng/L	0
Trans-chlordane*	Formulation	1200	10 (50)	ng/L	0
Methoxychlor*	Formulation	1200	10 (50)	ng/L	0

\*analytes marked with an asterisk are not included in the LGC's UKAS scope of accreditation

**Sample 19B**

**Chlorinated Solvents in Wastewater**

**Supplied as:**

1 x 500mL concentrated synthetic effluent sample

1 x 10mL spiking solution

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Hexachlorobutadiene	Formulation	1200	10 (60)	ng/L	0
Carbon Tetrachloride	Formulation	4000	10 (200)	ng/L	0
Tetrachloroethene	Formulation	4000	10 (200)	ng/L	0
1,2,4-Trichlorobenzene	Formulation	1200	10 (60)	ng/L	0
Trichloroethene	Formulation	4000	10 (200)	ng/L	0
1,1,1-Trichloroethane	Formulation	4000	10 (200)	ng/L	0
1,3,5-Trichlorobenzene	Formulation	1200	10 (60)	ng/L	0
1,2,3-Trichlorobenzene	Formulation	1200	10 (60)	ng/L	0
1,2-Dichloroethane	Formulation	4000	10 (200)	ng/L	0
Chloroform	Formulation	4000	10 (200)	ng/L	0

**Sample 19C****Supplied as:****Polycyclic Aromatic Hydrocarbons (2 Spikes) in Wastewater**

1 x 500mL concentrated synthetic effluent sample

2 x 10mL spiking solutions

*Spiking solution 19C1*

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Fluoranthene	Formulation	500	10 (25)	ng/L	0
Benzo(b)fluoranthene	Formulation	250	10 (12)	ng/L	0
Benzo(k)fluoranthene	Formulation	250	10 (12)	ng/L	0
Benz(a)pyrene	Formulation	120	10 (6)	ng/L	1
Benzo(ghi)perylene	Formulation	250	10 (12)	ng/L	0
Indeno(1,2,3-cd)pyrene	Formulation	250	10 (12)	ng/L	0

*Spiking solution 19C2*

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Acenaphthene	Formulation	250	10 (12)	ng/L	0
Acenaphthylene	Formulation	250	10 (12)	ng/L	0
Anthracene	Formulation	250	10 (12)	ng/L	0
Benz(a)anthracene	Formulation	250	10 (12)	ng/L	0
Chrysene	Formulation	250	10 (12)	ng/L	0
Dibenz(ah)anthracene	Formulation	250	10 (12)	ng/L	0
Fluorene	Formulation	250	10 (12)	ng/L	0
Naphthalene	Formulation	250	10 (12)	ng/L	0
Perylene	Formulation	250	10 (12)	ng/L	0
Phenanthrene	Formulation	250	10 (12)	ng/L	0
Pyrene	Formulation	250	10 (12)	ng/L	0

**Sample 19D****Supplied as:****Polychlorinated Biphenyls (PCBs) in Wastewater**

1 x 500mL concentrated synthetic effluent sample

1 x 10mL spiking solution

Analyte	AV	Max	SDPA % (fixed)	Units	DP
PCB (28)	Formulation	1000	10 (10)	ng/L	0
PCB (52)	Formulation	1000	10 (10)	ng/L	0
PCB (101)	Formulation	1000	10 (10)	ng/L	0
PCB (118)	Formulation	1000	10 (10)	ng/L	0
PCB (138)	Formulation	1000	10 (10)	ng/L	0
PCB (153)	Formulation	1000	10 (10)	ng/L	0
PCB (180)	Formulation	1000	10 (10)	ng/L	0

**Sample 20****Supplied as:****Acid Herbicides in Wastewater**

1 x 500mL concentrated synthetic effluent sample

3 x 10mL spiking solutions

*Spiking solution 20(1)*

Analyte	AV	Max	SDPA % (fixed)	Units	DP
2,4,5-T*	Formulation	1200	10 (50)	ng/L	0
2,4,5-TP (Fenoprop)*	Formulation	1200	10 (50)	ng/L	0
2,4-D	Formulation	1200	10 (50)	ng/L	0
2,4-DB	Formulation	1200	10 (50)	ng/L	0
Dicamba	Formulation	1200	10 (50)	ng/L	0
2,3,6-TBA*	Formulation	1200	10 (50)	ng/L	0
Clopyralid*	Formulation	1200	10 (50)	ng/L	0
Fluroxypyr*	Formulation	1200	10 (50)	ng/L	0
Benazolin*	Formulation	1200	10 (50)	ng/L	0
Mecoprop	Formulation	1200	10 (50)	ng/L	0
Dichlorprop	Formulation	1200	10 (50)	ng/L	0
MCPA	Formulation	1200	10 (50)	ng/L	0
MCPB	Formulation	1200	10 (50)	ng/L	0
Triclopyr	Formulation	1200	10 (50)	ng/L	0

\*analytes marked with an asterisk are not included in the LGC's UKAS scope of accreditation

*Spiking solution 20(2)*

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Bentazone	Formulation	1200	10 (50)	ng/L	0
Bromoxynil	Formulation	1200	10 (50)	ng/L	0
Dichlobenil*	Formulation	1200	10 (50)	ng/L	0
loxylinil	Formulation	1200	10 (50)	ng/L	0
Metaldehyde	Formulation	1200	10 (50)	ng/L	0
Metazachlor*	Formulation	1200	10 (50)	ng/L	0
Propachlor*	Formulation	1200	10 (50)	ng/L	0
Propyzamide	Formulation	1200	10 (50)	ng/L	0

\*analytes marked with an asterisk are not included in the LGC's UKAS scope of accreditation

*Spiking solution 20(3)*

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Glyphosate	Formulation	1200	10 (50)	ng/L	0
AMPA	Formulation	1200	10 (50)	ng/L	0

**Sample 20B****Supplied as:****Triazines and Urea Herbicides in Wastewater**

1 x 500mL concentrated synthetic effluent sample

2 x 10mL spiking solutions

*Spiking solution 20B(1)*

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Isoproturon	Formulation	1200	10 (50)	ng/L	0
Diuron	Formulation	1200	10 (50)	ng/L	0
Linuron	Formulation	1200	10 (50)	ng/L	0
Chlortoluron	Formulation	1200	10 (50)	ng/L	0
Monuron	Formulation	1200	10 (50)	ng/L	0
Methabenzthiazuron*	Formulation	1200	10 (50)	ng/L	0
Diflufenican*	Formulation	1200	10 (50)	ng/L	0
Bromacil*	Formulation	1200	10 (50)	ng/L	0

*Spiking solution 20B(2)*

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Simazine	Formulation	1200	10 (50)	ng/L	0
Atrazine	Formulation	1200	10 (50)	ng/L	0
Propazine	Formulation	1200	10 (50)	ng/L	0
Cyanazine*	Formulation	1200	10 (50)	ng/L	0
Trietazine*	Formulation	1200	10 (50)	ng/L	0
Prometryn*	Formulation	1200	10 (50)	ng/L	0
Terbutryn*	Formulation	1200	10 (50)	ng/L	0
Ametryn*	Formulation	1200	10 (50)	ng/L	0
Carbetamide*	Formulation	1200	10 (50)	ng/L	0
Pirimicarb*	Formulation	1200	10 (50)	ng/L	0
Metamitron*	Formulation	1200	10 (50)	ng/L	0

\*analytes marked with an asterisk are not included in the LGC's UKAS scope of accreditation

**Sample 21****Organophosphorus Pesticides in Wastewater****Supplied as:**

1 x 500mL concentrated synthetic effluent sample

1 x 10mL spiking solution

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Azinphos-methyl	Formulation	1200	10 (50)	ng/L	0
Azinphos-ethyl	Formulation	1200	10 (50)	ng/L	0
Dichlorvos	Formulation	1200	10 (50)	ng/L	0
Fenitrothion	Formulation	1200	10 (50)	ng/L	0
Malathion	Formulation	1200	10 (50)	ng/L	0
Mevinphos	Formulation	1200	10 (50)	ng/L	0
Chlorfenvinphos	Formulation	1200	10 (50)	ng/L	0
Diazinon	Formulation	1200	10 (50)	ng/L	0
Fenthion	Formulation	1200	10 (50)	ng/L	0
Parathion-ethyl	Formulation	1200	10 (50)	ng/L	0
Parathion-methyl	Formulation	1200	10 (50)	ng/L	0
Chlorpyrifos	Formulation	1200	10 (50)	ng/L	0
Cypermethrin	Formulation	1200	10 (50)	ng/L	0
Propetamphos*	Formulation	1200	10 (50)	ng/L	0

\*analytes marked with an asterisk are not included in the LGC's UKAS scope of accreditation

**Sample 22****Qualitative Organics by GCMS in Clean Water****Supplied as:**

1 x 1mL sample containing ten organic compounds

1 x 1mL blank sample

Ten organic analytes are provided for qualitative identification. This sample is designed to test the ability of laboratories to identify organic compounds via GCMS analysis.

Participants are provided with a solution containing ten organic compounds. The test requires that participants identify the ten compounds present. Results returned will be identified as satisfactory or unsatisfactory. Participants are also provided with a solvent blank.

The choice of the ten organic compounds is designed to avoid the formation of reaction by-products.



**Sample 22A****Qualitative Organics by Purge and Trap GCMS in Clean Water****Supplied as:**

1 x 40mL sample containing six organic compounds

1 x 40mL blank sample

Six organic analytes are provided for qualitative identification. This sample is designed to test the ability of laboratories to identify organic compounds via purge and trap GCMS analysis.

Participants are provided with a solution containing six organic compounds. The test requires that participants identify the six compounds present. Results returned will be identified as satisfactory or unsatisfactory. Participants are also provided with a solvent blank.

The choice of the 6 organic compounds is designed to avoid the formation of reaction by-products.

**Sample 23****Mineral Oil in Water****Supplied as:**

1 x variable volume sample

Analyte	AV	Range (Max)	SDPA % (fixed)	Units	DP
Volume of sample provided	Formulation	0.3-0.9	5	L	3
Total Hydrocarbons by GC Analysis	Formulation	(50)	15 (1)	mg/L	1
Total Hydrocarbons by IR Analysis	Formulation	(50)	15 (1)	mg/L	1
Total Hydrocarbons by Gravimetric Analysis	Formulation	(50)	15 (1)	mg/L	1

A 50:50 mixture of Type A and Type B mineral oils will be used to prepare these samples. This is designed to match the needs of ISO 9377 with a carbon range of C10 to C40 inclusive.

**Sample 24****Oil and Grease in Water****Supplied as:**

1 x variable volume sample

Analyte	AV	Range	SDPA % (fixed)	Units	DP
Volume of sample provided	Formulation	0.75-0.9	5	L	3
Total Oil and Grease	Formulation	40-200	15 (1)	mg/L	1

**Sample 25**                      **Qualitative Determination in Clean Water****Supplied as:**                      1 x 2L sample

The intent of this sample is to test the ability of laboratories to detect and identify an unknown contaminant in surface/potable waters. This sample is designed for laboratories which may be involved in investigating potentially contaminated potable or surface waters and tests both the extraction and identification stages of investigations.

Participants are provided with a two litre water sample and one or more 'indicators' of a potential problem, e.g. water is discoloured or has an oily sheen.

Participants are asked to identify the contaminating substance(s). Results returned will be identified as satisfactory or unsatisfactory.

**Sample 26**                      **PFOS and PFOA in Clean Water****Supplied as:**                      1 x 5mL spiking solution

Analyte	AV	Range	SDPA %	Units	DP
PFOS	Formulation	1-10	10	µg/L	2
PFOA	Formulation	2-20	10	µg/L	2

**Sample 27**                      **AOX in Wastewater****Supplied as:**                      1 x 10mL spiking solution  
1 x 500mL synthetic effluent matrix

Analyte	AV	Range	SDPA %	Units	DP
AOX	Formulation	2-10	10	mgCl/L	2

**Sample 28**                      **Formaldehyde in Clean Water****Supplied as:**                      1 x 10mL spiking solution

Analyte	AV	Range	SDPA %	Units	DP
Formaldehyde	Formulation	0.01-1	10	mg/L	3

**Sample 29**                      **High and Low COD****Supplied as:**                      1 x 250mL spiking solution for high level COD  
1 x 250mL spiking solution for low level COD

Analyte	AV	Range	SDPA %	Units	DP
COD – high	Formulation	500-10000	5	mgO <sub>2</sub> /L	0
COD – low	Formulation	14-70	10	mgO <sub>2</sub> /L	1

**Sample 30****Gross Alpha and Gross Beta in Clean Water****Supplied as:**

1 x 2L sample

Analyte	AV	Range	SDPA %	Units	DP
Gross Alpha as <sup>239</sup> Plutonium	RMean	0.05-0.15 (occasionally up to 0.5)	20	Bq/L	3
Gross Alpha as <sup>241</sup> Americium	RMean	0.05-0.15 (occasionally up to 0.5)	20	Bq/L	3
Gross Alpha as <sup>230</sup> Thorium	RMean	0.05-0.15 (occasionally up to 0.5)	20	Bq/L	3
Gross Beta as <sup>40</sup> Potassium	RMean	0.5-1.5 (occasionally up to 5)	20	Bq/L	3
Gross Beta as <sup>137</sup> Caesium	RMean	0.5-1.5 (occasionally up to 5)	20	Bq/L	3
Gross Beta as <sup>90</sup> Strontium	RMean	0.5-1.5 (occasionally up to 5)	20	Bq/L	3

**Sample 31****Aqueous Tritium in Clean Water****Supplied as:**

1 x 250mL sample

Analyte	AV	Range	SDPA %	Units	DP
Aqueous Tritium	Formulation	25-75 (occasionally up to 150)	10	Bq/L	2

**Sample 32\*\*****Sulfide in Wastewater****Supplied as:**

1 x 125mL sample

Analyte	AV	Range	SDPA %	Units	DP
Total sulfide	Formulation	4-20	10	mg/L	2

**Sample 33\*\*****Chlorophyll a in Clean Water****Supplied as:**

1 x 5mL vial of Algae extract

Analyte	AV	Range	SDPA	Units	DP
Chlorophyll a	RMean	1-300	RSD	mg/m3	2

\*\*Test materials currently not included in LGC Standards' UKAS Scope of Accreditation

Participants are provided with a material for testing chlorophyll, suitable methods to analyse this sample will be spectrometry and fluorometric. The final report will be assessing the methods individually.

**Sample 34\*\***

**Water Framework Directive**

**Sample A\*\***

**Supplied as:**

1 x 500mL metals sample, 1 x 30mL mercury spiking solution

Analyte	AV	Range	SDPA %	Units	DP
Cadmium	RMean	0.05-0.25	10	µg/L	3
Lead	RMean	0.7-10	10	µg/L	2
Mercury	RMean	0.02-2	10	µg/L	3
Nickel	RMean	5-50	10	µg/L	2

**Sample B\*\***

**Supplied as:**

1 x 10mL spiking solution  
1 x 2L groundwater

Analyte	AV	Range	SDPA %	Units	DP
Atrazine	Formulation	0.15-0.75	25	µg/L	3
Diuron	Formulation	0.05-0.25	25	µg/L	3
Isoproturon	Formulation	0.08-0.4	25	µg/L	3
Simazine	Formulation	0.2-2	25	µg/L	3

**Sample C\*\***

**Supplied as:**

1 x 10mL spiking solution

Analyte	AV	Range	SDPA %	Units	DP
Alachlor	Formulation	0.04-0.4	25	µg/L	3
Chlorfenvinphos	Formulation	0.02-0.2	25	µg/L	3
Chlorpyrifos	Formulation	0.01-0.1	25	µg/L	3

**Sample D\*\***

**Supplied as:**

1 x 10mL spiking solution

Analyte	AV	Range	SDPA %	Units	DP
4-n Pentyphenol	Formulation	0.04-0.4	25	µg/L	3
4-n Hexylphenol	Formulation	0.04-0.4	25	µg/L	3
4-n Heptylphenol	Formulation	0.04-0.4	25	µg/L	3
4 tert-Octylphenol	Formulation	0.02-0.2	25	µg/L	3
4-n-Nonylphenol	Formulation	0.04-0.4	25	µg/L	3
Pentachlorophenol	Formulation	0.05-0.5	25	µg/L	3
Bisphenol A	Formulation	0.02-1.0	25	µg/L	3

**Sample E\*\***

**Supplied as:** 1 x 10mL spiking solution  
1 x 2L groundwater

Analyte	AV	Range	SDPA %	Units	DP
Endosulphan	Formulation	0.003-0.03	25	µg/L	4
Hexachlorobenzene	Formulation	0.003-0.03	25	µg/L	4
Hexachlorocyclohexane	Formulation	0.003-0.03	25	µg/L	4
Pentachlorobenzene	Formulation	0.003-0.03	25	µg/L	4
Trifluralin	Formulation	0.01-0.1	25	µg/L	3
Hexachlorobutadiene	Formulation	0.02-0.2	25	µg/L	3

**Sample F\*\***

**Supplied as:** 1 x 10mL spiking solution

Analyte	AV	Range	SDPA %	Units	DP
Benz(a)pyrene	Formulation	0.01-0.1	25	µg/L	3
Benzo(b)fluoranthene	Formulation	0.01-0.1	25	µg/L	3
Benzo(ghi)perylene	Formulation	0.001-0.01	25	µg/L	4
Benzo(k)fluoranthene	Formulation	0.01-0.1	25	µg/L	3
Indeno(123-cd)pyrene	Formulation	0.001-0.01	25	µg/L	4
Anthracene	Formulation	0.03-0.3	25	µg/L	3
Fluoranthene	Formulation	0.03-0.3	25	µg/L	3

**Sample G\*\***

**Supplied as:** 1 x 10mL spiking solution

Analyte	AV	Range	SDPA %	Units	DP
Tributyltin compounds	Formulation	2-10	25	ng/L	2

**Sample H\*\***

**Supplied as:** 1 x 10mL spiking solution

Analyte	AV	Range	SDPA %	Units	DP
1,2-Dichloroethane	Formulation	2-20	25	µg/L	2
Dichloromethane	Formulation	5-50	25	µg/L	2
Trichlorobenzenes	Formulation	0.1-1	25	µg/L	2
Trichloromethane	Formulation	0.5-5	25	µg/L	2

**Sample I\*\***

**Supplied as:** 1 x 10mL spiking solution

Analyte	AV	Range	SDPA %	Units	DP
2,4,4-Tribromodiphenylether (BDE 28)	Formulation	0.2-1	25	ng/L	3
2,2,4,4,5-Pentabromodiphenylether (BDE 99)	Formulation	0.2-1	25	ng/L	3
2,2,4,4,5,6-Hexabromodiphenylether (BDE 154)	Formulation	0.2-1	25	ng/L	3

**Sample J\*\***

**Supplied as:** 1 x 10mL spiking solution for DEHP  
 1 x 10mL spiking solution for benzene and naphthalene  
 1 x 10ml blank DEHP sample in methanol

Analyte	AV	Range	SDPA %	Units	DP
DEHP	Formulation	0.3-3	25	µg/L	2
Benzene	Formulation	2-20	25	µg/L	2
Naphthalene	Formulation	0.5-5	25	µg/L	2

\*\*Test materials currently not included in LGC Standards' UKAS Scope of Accreditation

**Sample 35\*\***

**BOD/COD at high concentration**

**Supplied as:** 2 x 30ml samples for the determination of COD and BOD

Analyte	AV	Max	SDPA %	Units	DP
COD	Formulation	500	5	mgO <sub>2</sub> /L	1
BOD	Formulation	300	10	mgO <sub>2</sub> /L	1

\*\*Test materials currently not included in LGC Standards' UKAS Scope of Accreditation

**Sample 36\*\***

**Taste and odour**

**Supplied as:** 1 x 500mL sample for determination of taste  
 1 x 1L sample for determination of odour

Analyte	AV	Range	SDPA	Units	DP
TFN	RMean	Various	1.0000	-	1
TON	RMean	Various	1.0000	-	1

\*\*Test materials currently not included in LGC Standards' UKAS Scope of Accreditation

**Sample 37\*\*****Acrylamide****Supplied as:**

1 x 10mL spiking solution

Analyte	AV	Range	SDPA %	Units	DP
Acrylamide	Formulation	0.05-0.5	10	µg/L	3

\*\*Test materials currently not included in LGC Standards' UKAS Scope of Accreditation

**Sample 38\*\*****UV Absorbing Organic Constituents (254 nm)****Supplied as:**

1 x 60ml spiking solution

Analyte	AV	Max	SDPA %	Units	DP
UV absorption	RMean	0.900	Robust SD	cm <sup>-1</sup>	3

\*\*Test materials currently not included in LGC Standards' UKAS Scope of Accreditation

**Sample 39\*\*****Geosmin and MIB****Supplied as:**

1 x 1L sample containing all determinands

Analyte	AV	Range	SDPA %	Units	DP
Geosmin	Formulation	2-200	15	ng/L	2
Methyl isoborneol	Formulation	2-200	15	ng/L	2

\*\*Test materials currently not included in LGC Standards' UKAS Scope of Accreditation

**Sample 40\*\*****Fungicides****Supplied as:**

1 x 10mL spiking solution

1 x 500mL of groundwater sample

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Carbendazim	Formulation	120	10 (5)	ng/L	1
Chlorothalonil	Formulation	120	10 (5)	ng/L	1
Fenpropimorph	Formulation	120	10 (5)	ng/L	1
Flutriafol	Formulation	120	10 (5)	ng/L	1
Epoxyconazole	Formulation	120	10 (5)	ng/L	1
Flusilazole	Formulation	120	10 (5)	ng/L	1
Cyproconazole	Formulation	120	10 (5)	ng/L	1
Tebuconazole	Formulation	120	10 (5)	ng/L	1
Azoxystrobin	Formulation	120	10 (5)	ng/L	1
Boscalid	Formulation	120	10 (5)	ng/L	1
Kresoxym-methyl	Formulation	120	10 (5)	ng/L	1
Cyprodinil	Formulation	120	10 (5)	ng/L	1
Propiconazole	Formulation	120	10 (5)	ng/L	1
Prothioconazole	Formulation	120	10 (5)	ng/L	1

\*\*Test materials currently not included in LGC Standards' UKAS Scope of Accreditation

**Sample 41\*\*****Microcystin****Supplied as:**

1 x 30mL spiking solution

Analyte	AV	Max	SDPA %	Units	DP
Microcystin-LR	Formulation	5	Robust SD	ug/L	2
Microcystin-YR	Formulation	5	Robust SD	ug/L	2
Microcystin-RR	Formulation	5	Robust SD	ug/L	2

\*\*Test materials currently not included in LGC Standards' UKAS Scope of Accreditation

**Sample 42\*\*****Plutonium and Uranium****Supplied as:**

1 x 250ml sample for determination of plutonium

1 x 250ml sample for determination of uranium

Analyte	AV	Max	SDPA %	Units	DP
Plutonium-239	Formulation	0.6	Robust SD	Bq/L	3
Uranium-234	Formulation	1	Robust SD	Bq/L	3
Uranium-235	Formulation	0.05	Robust SD	Bq/L	4
Uranium-238	Formulation	1	Robust SD	Bq/L	3
Total Uranium	Formulation	100	Robust SD	µg/L	2

\*\*Test materials currently not included in LGC Standards' UKAS Scope of Accreditation

**Sample 50****Ecotoxicology****Supplied as:**

1 x 500mL sample

Analyte	AV	SDPA %	Units	DP
<i>Daphnia Magna</i> 48hr EC50	RMean	30	% Dilution	3
<i>Daphnia Magna</i> 24hr EC50	RMean	30	% Dilution	3
<i>Vibrio Fischeri</i> 30 minute IC50 (ISO 11348-3)	RMean	30	% Dilution	3
Other 30 min luminescent bacteria IC50 tests	RMean	30	% Dilution	3
15 minute luminescent bacteria IC50 tests	RMean	30	% Dilution	3
Freshwater algae growth inhibition test ( <i>Pseudokirschneriella subcapitata</i> )	RMean	30	% Dilution	3

Participants are required to dilute the sample provided in line with their usual practice, and to determine the EC50 (or IC50) dilution using any or all of the ecotoxicity tests listed. The solution will contain zinc sulfate at a concentration in the range 10 to 200mgZn/L. The % dilutions to produce an EC50 returned will be converted to mg Zn/L and performance scores awarded based on a suitable assigned value with a percentage SDPA of 30%.



## APPENDIX B – Aquacheck Trials

The sample descriptions below are intended as a guide only. Please be aware that, due to the nature of the trials, and to aid their development, the details may change from time to time. Where participants would be interested in alternative ranges or additional analytes, please do not hesitate to contact LGC Standards Proficiency Testing with details.

LGC Standards PT reserves the right not to provide the samples should they prove technically unfeasible.

The samples provided in the trials are not currently within the scope of LGC's UKAS accreditation.

### Triclosan

**Supplied as:** 1 x 10mL spiking solution  
1 x 2L groundwater

Analyte	AV	Range	SDPA %	Units	DP
Triclosan	Formulation	0.01-100	10	µg/L	2

### Semi-Volatile Organic Compounds

**Supplied as:** 1 x 10mL spiking solution

Analyte	AV	Range	SDPA %	Units	DP
TBC***	Formulation	1-15	10	µg/L	2

Participants are provided with a solution containing six semi volatile organic compounds (SVOCs) for quantitative determination. A list of potential analytes is provided in Appendix C.

### Pharmaceuticals

**Supplied as:** 1 x 10mL spiking solution for pharmaceuticals

Analyte	AV	Max	SDPA %	Units	DP
Ibuprofen	Formulation	1	10	µg/L	3
Propranolol	Formulation	1	10	µg/L	3
Ofloxacin	Formulation	1	10	µg/L	3
Oxytetracycline	Formulation	1	10	µg/L	3
Salicylic acid	Formulation	1	10	µg/L	3
Fluoxetine	Formulation	1	10	µg/L	3
Diclofenac	Formulation	1	10	µg/L	3

### Haloacetic Acids

**Supplied as:** 1 x 30ml spiking solution

Analyte	AV	Max	SDPA %	Units	DP
Monochloroacetic acid	Formulation	50	10	ug/L	2
Dichloroacetic acid	Formulation	50	10	ug/L	2
Trichloroacetic acid	Formulation	50	10	ug/L	2
Monobromoacetic acid	Formulation	50	10	ug/L	2
Dibromoacetic acid	Formulation	50	10	ug/L	2

The structure of this sample is to be confirmed and details will be circulated to participants prior to each round.

Aquacheck Scheme Description

**MCerts**

**Supplied as:**

1 x 500mL sample containing all determinands

Analyte	AV	Range	SDPA % (fixed)	Units	DP
Ammonia	Formulation	0.5-10	10	mgN/L	2
COD	Formulation	10-100	7.5	mgO <sub>2</sub> /L	1
Conductivity (20°C)	RMean	500-1000	7.5	µS/cm	1
Nitrate	Formulation	3.75-30	7.5	mgN/L	3
Nitrite	Formulation	0.1-4	7.5	mgN/L	3
Orthophosphate	Formulation	0.13-10	10	mgP/L	3
pH at 20-25°C	RMean	7-8	(0.1)	-	2
Total arsenic	Formulation	0.5-10	10	µg/L	2
Total copper	Formulation	0.5-5	10	µg/L	2
Total mercury	Formulation	0.01-0.1	10	µg/L	3
Total cadmium	Formulation	0.1-1	10	µg/L	2
Total lead	Formulation	0.4-4	10	µg/L	2
Total nickel	Formulation	5-50	10	µg/L	1
Turbidity	RMean	3-30	10	NTU	2

**Synthetic Pyrethroid Insecticides**

**Supplied as:**

1 x 30ml spiking solution

Analyte	AV	Max	SDPA %	Units	DP
Bifenthrin	Formulation	250	10	ng/L	1
Cyfluthrin	Formulation	250	10	ng/L	1
Cypermethrin	Formulation	250	10	ng/L	1
Flumethrin	Formulation	250	10	ng/L	1
Permethrin	Formulation	250	10	ng/L	1

The structure of this sample is to be confirmed and details will be circulated to participants prior to each round.

**Low Level CIP2 contaminants**

**Supplied as:**

2 x 10mL spiking solution  
1 x 7mL spiking solution

Analyte	AV	Max	SDPA %	Units	DP
Benzo(a)pyrene	Formulation	20	25	ng/L	3
Fluoranthene	Formulation	20	25	ng/L	3
Cypermethrin	Formulation	10	25	ng/L	3
PFOS	Formulation	1	25	ng/L	3
PFOA	Formulation	1	25	ng/L	3

The structure of this sample is to be confirmed and details will be circulated to participants prior to each round.

**Acetate & Iodide**

**Supplied as:**

1 x 30mL spiking solution

Analyte	AV	Max	SDPA %	Units	DP
Acetate	Formulation	20	10	mg/L	2
Iodide	Formulation	0.5	10	mg/L	3

The structure of this sample is to be confirmed and details will be circulated to participants prior to each round.

Aquacheck Scheme Description

**Inorganic NPK Fertiliser**

**Supplied as:**

1 x 50g sample

Analyte	AV	Range	SDPA %	Units	DP
Total nitrogen	RMean	All	10	%	1
Ammoniacal nitrogen	RMean	All	10	%	1
Urea nitrogen	RMean	All	10	%	1
Soluble potash	RMean	All	10	%	1
Mercury	RMean	All	10	mg/kg	2
Lead	RMean	All	10	mg/kg	2
Cadmium	RMean	All	10	mg/kg	2
Calcium	RMean	All	10	mg/kg	2
Fluoride	RMean	All	10	mg/kg	2
Total phosphorus	RMean	All	10	%	1
Total potassium	RMean	All	10	%	1
Iron	RMean	All	10	%	1

The structure of this sample is to be confirmed and details will be circulated to participants prior to each round (analytes may change in each round depending on fertiliser used).

**Saline Water – Nutrients**

**Supplied as:**

1 x 500mL sample containing all determinands

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Nitrate	RMean	All	10	mgNO <sub>3</sub> /L	2
Total Phosphorus	RMean	All	10	mgP/L	0
Potassium	RMean	All	10	mgK/L	3
Sulfate	RMean	All	10	mgSO <sub>4</sub> /L	2
Magnesium	RMean	All	10	mg/L	0
Calcium	RMean	All	10	mg/L	0
Alkalinity	RMean	All	10	mgHCO <sub>3</sub> /L	1
Ammonia	RMean	All	10	mgN/L	2
Total Nitrogen	RMean	All	10	mgN/L	1
Orthophosphate	RMean	All	10	mgP/L	3
pH at 20-25°C	RMean	All	(0.1)	-	2
Conductivity (20°C)	RMean	All	7.5	µS/cm	1
Silicate	RMean	All	10	mgSiO <sub>2</sub> /L	2

The structure of this sample is to be confirmed and details will be circulated to participants prior to each round.

Aquacheck Scheme Description

**Organic Fertiliser**

**Supplied as:**

1 x 50g sample

Analyte	AV	Range	SDPA %	Units	DP
Total nitrogen	RMean	All	10	%	1
Available phosphate (P2O5)	RMean	All	10	%	1
Soluble potash (K2O)	RMean	All	10	%	1
Magnesium	RMean	All	10	%	1
Arsenic	RMean	All	10	mg/kg	2
Cadmium	RMean	All	10	mg/kg	2
Chromium	RMean	All	10	mg/kg	2
Manganese	RMean	All	10	%	2
Zinc	RMean	All	10	%	2

The structure of this sample is to be confirmed and details will be circulated to participants prior to each round (analytes may change in each round depending on fertiliser used).

**Bottled Mineral Water**

**Supplied as:**

1 x 500mL sample

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Calcium	Formulation	250	7.5 (1)	mg/L	2
Magnesium	Formulation	50	7.5 (0.25)	mg/L	2
Potassium	Formulation	12	7.5 (0.2)	mg/L	3
Sodium	Formulation	200	7.5 (0.5)	mg/L	2
Bicarbonate	Formulation	600	10 (5)	mgCa/L	1
Chloride	Formulation	200	7.5 (2)	mg/L	2
Sulfate	Formulation	200	7.5 (1)	mg/L	2
Nitrate	Formulation	50	7.5 (0.1)	mgNO <sub>3</sub> /L	2
pH	Formulation	4-10	(0.1)	-	1
TDS/ Dry Residue	Formulation	1500	10 (10)	mg/L	0

The structure of this sample is to be confirmed and details will be circulated to participants prior to each round.

**Trihalomethanes (THMs) & Nutrients in Recreational Water**

**Supplied as:**

1 x 500mL sample containing all determinands

Analyte	AV	Max	SDPA % (fixed)	Units	DP
Trichloromethane	RMean	150	10	ug/L	2
Bromodichloromethane	RMean	150	10	ug/L	2
Dibromodichloromethane	RMean	150	10	ug/L	2
Tribromomethane	RMean	150	10	ug/L	2
Total trihalomethanes (TTHM)	RMean	100	10	ug/L	2
pH at 20-25°C	RMean	8	(0.1)	-	2
Total organic carbon (TOC)	RMean	12	10	mgC/L	2
Total Alkalinity	RMean	200	10	mgHCO <sub>3</sub> /L	1
Total Hardness	RMean	500	10	mgCa/L	1
Total Dissolved Solids	RMean	2500	10	mg/L	0

The structure of this sample is to be confirmed and details will be circulated to participants prior to each round.

Aquacheck Scheme Description

**Saline Water – Metals**

**Supplied as:**

1 x 500mL sample containing all determinands

Analyte	AV	Range	SDPA %	Units	DP
Arsenic	RMean	10-50	10	µg/L	1
Boron	RMean	6-30	10	mg/L	1
Cadmium	RMean	0.2-1	10	µg/L	3
Copper	RMean	0.2-1	10	µg/L	3
Iron	RMean	0.3-1.5	10	mg/L	2
Manganese	RMean	0.2-1	10	µg/L	3
Molybdenum	RMean	2-10	10	µg/L	2
Strontium	RMean	15-75	10	mg/L	1
Zinc	RMean	1-5	10	µg/L	2
Barium	RMean	10-100	10	mg/L	1
Lithium	RMean	10-100	10	mg/L	1
Sodium	RMean	100-10000	10	mg/L	0
Sulfur	RMean	100-1000	10	mg/L	0
Nickel	RMean	0.1-7	10	µg/L	3
Cobalt	RMean	0.01-0.5	10	µg/L	3
Lead	RMean	0.05-1.5	10	µg/L	3
Selenium	RMean	0.06-0.12	10	µg/L	3

The structure of this sample is to be confirmed and details will be circulated to participants prior to each round.

**EQSD Directive – Low Level Triazines**

**Supplied as:**

1 x 10mL spiking solution for triazines

Analyte	AV	Max	SDPA %	Units	DP
Simazine	Formulation	5	25	ng/L	3
Atrazine	Formulation	5	25	ng/L	3
Terbutryn	Formulation	5	25	ng/L	3
Alachlor	Formulation	5	25	ng/L	3
Diclofol	Formulation	5	25	ng/L	3
Bifenox	Formulation	5	25	ng/L	3
Quinoxifen	Formulation	5	25	ng/L	3

The structure of this sample is to be confirmed and details will be circulated to participants prior to each round

**EQSD Directive – Low Level Organophosphorus & Chlorinated Solvents**

**Supplied as:**

1 x 10mL spiking solutions for organophosphorus

1 x 10mL spiking solution for chlorinated solvents

Analyte	AV	Max	SDPA %	Units	DP
Dichlorvos	Formulation	5	25	ng/L	3
Fenitrothion	Formulation	5	25	ng/L	3
Malathion	Formulation	5	25	ng/L	3
Chlorfenvinphos	Formulation	5	25	ng/L	3
Diazinon	Formulation	5	25	ng/L	3
Chlorpyrifos	Formulation	5	25	ng/L	3
Hexachlorobutadiene	Formulation	5	25	ng/L	3

Aquacheck Scheme Description

Analyte	AV	Max	SDPA %	Units	DP
1,2,3-Trichlorobenzene	Formulation	5	25	ng/L	3
1,2,4-Trichlorobenzene	Formulation	5	25	ng/L	3
1,3,5-Trichlorobenzene	Formulation	5	25	ng/L	3

The structure of this sample is to be confirmed and details will be circulated to participants prior to each round

**EQSD Directive – Low Level Organochlorines**

**Supplied as:** 1 x 10mL spiking solution for organochlorines

Analyte	AV	Max	SDPA %	Units	DP
Endrin	Formulation	5	25	ng/L	3
Dieldrin	Formulation	5	25	ng/L	3
Aldrin	Formulation	5	25	ng/L	3
p,p'-DDT	Formulation	5	25	ng/L	3
o,p'-DDT	Formulation	5	25	ng/L	3
p,p'-DDE	Formulation	5	25	ng/L	3
p,p'-DDD	Formulation	5	25	ng/L	3
Alpha Hexachlorocyclohexane	Formulation	5	25	ng/L	3
Beta Hexachlorocyclohexane	Formulation	5	25	ng/L	3
Delta Hexachlorocyclohexane	Formulation	5	25	ng/L	3
Lindane (Gamma HCH)	Formulation	5	25	ng/L	3
Trifluralin	Formulation	5	25	ng/L	3
Alpha Endosulphan	Formulation	5	25	ng/L	3
Beta Endosulphan	Formulation	5	25	ng/L	3
Hexachlorobenzene	Formulation	5	25	ng/L	3
Heptachlor	Formulation	5	25	ng/L	3
Heptachlor epoxide	Formulation	5	25	ng/L	3
Pentachlorobenzene	Formulation	5	25	ng/L	3
Pendimethalin*	Formulation	5	25	ng/L	3

The structure of this sample is to be confirmed and details will be circulated to participants prior to each round

**Soil Texture**

**Supplied as:** 1 x 150g soil

The intent of this sample is to test the ability of the laboratories in identifying the type of soil provided i.e. sand, clay, silt. Results returned will be identified as satisfactory or unsatisfactory.

Aquacheck Scheme Description

**Explosives in Groundwater**

**Supplied as:**

1 x 2L groundwater sample  
1 x 1mL spiking solution

Analyte	AV	Max	SDPA	Units	DP
1,3,5-Trinitrobenzene	Formulation	5	Robust SD	ug/L	1
1,3-Dinitrobenzene	Formulation	5	Robust SD	ug/L	1
2,4-Dinitrotoluene	Formulation	2.5	Robust SD	ug/L	2
2,6-Dinitrotoluene	Formulation	2.5	Robust SD	ug/L	2
2-Amino-4,6-dinitrotoluene	Formulation	5	Robust SD	ug/L	1
2-Nitrotoluene	Formulation	25	Robust SD	ug/L	1
3-Nitrotoluene	Formulation	25	Robust SD	ug/L	1
4-Amino-2,6-dinitrotoluene	Formulation	5	Robust SD	ug/L	1
4-Nitrotoluene	Formulation	25	Robust SD	ug/L	1
Diphenylamine	Formulation	5	Robust SD	ug/L	1
Nitrobenzene	Formulation	25	Robust SD	ug/L	1
PETN (Pentaerythritol tetranitrate)	Formulation	5	Robust SD	ug/L	1
HMX (Octogen)	Formulation	5	Robust SD	ug/L	1

The structure of this sample is to be confirmed and details will be circulated to participants prior to each round.

**APPENDIX C – Potential SVOCs**

<b>Chemical</b>	<b>CAS Number</b>	<b>Chemical</b>	<b>CAS Number</b>
1,2,4-trichlorobenzene	120-82-1	Benzo(g,h,i)perylene	191-24-2
1,2-dichlorobenzene	95-50-1	Benzo(k)fluoranthene	207-08-9
1,2-dinitrobenzene	528-29-0	Benzyl alcohol	100-51-6
1,3-dichlorobenzene	541-73-1	Bis(2-chloroethoxy)methane	111-91-1
1,3-dinitrobenzene	99-65-0	Bis(2-chloroisopropyl)ether	108-60-1
1,4 dichlorobenzene	106-46-7	Bis(2-ethylhexl)adipate	103-23-1
1,4-dinitrobenzene	100-25-4	Bis(2-ethylhexyl)phthalate	117-81-7
1-methylnaphthalene	90-12-0	Bis-2-chloroethyl ether	111-44-4
2,3,4,6-tetrachlorophenol	58-90-2	Butyl benzyl phthalate	85-68-7
2,3,5,6-tetrachlorophenol	935-95-5	Carbazole	86-74-8
2,4 dinitrotoluene	121-14-2	Chrysene	218-01-9
2,4,5-trichlorophenol	95-95-4	Dibenz(a,h)anthracene	53-70-3
2,4,6-trichlorophenol	88-06-2	Dibenzofuran	132-64-9
2,4-dichlorophenol	120-83-2	Dibutyl phthalate	84-74-2
2,4-dimethylphenol	105-67-9	Diethyl phthalate	84-66-2
2,6-dinitrotoluene	606-20-2	Dimethylphthalate	131-11-3
2-chloronaphthalene	91-58-7	Di-n-octyl phthalate	117-84-0
2-chlorophenol	95-57-8	Diphenylamine	122-39-4
2-methylnaphthalene	91-57-6	Fluoranthene	206-44-0
2-methylphenol	95-48-7	Fluorene	86-73-7
2-nitroaniline	88-74-4	Hexachloro-1,3-butadiene	87-68-3
2-nitrophenol	88-75-5	Hexachlorobenzene	118-74-1
4-bromodiphenyl ether	101-55-3	Hexachlorocyclopentadiene	77-47-4
4-chloro-3-methylphenol	59-50-7	Hexachloroethane	67-72-1
4-chloroaniline	106-47-8	Indeno(1,2,3 cd)pyrene	193-39-5
4-chlorodipheny ether	7005-72-3	Isophorone	78-59-1
Acenaphthene	83-32-9	Naphthalene	91-20-3
Acenaphthylene	208-96-8	Nitrobenzene	98-95-3
Aniline	62-53-3	n-nitroso-di-n-propylamine	621-64-7
Anthracene	120-12-7	Pentachlorophenol	87-86-5
Azobenzene	103-33-3	Phenanthrene	85-01-8
Benz(a)anthracene	56-55-3	Phenol	108-95-2
Benzo(a)pyrene	50-32-8	Pyrene	129-00-0
Benzo(b)fluoranthene	205-99-2		