



Sample Preparation Instructions

Changes to Document from Previous Issue

- Change to the preparation procedure for the Total Chlorine sample (3C)

General Instructions

Sample Storage

All samples and spiking solutions should be stored in a refrigerator at 2-8°C in the dark from the time of arrival at your laboratory. If a preservative is routinely added to the type of sample provided as part of your laboratory procedures, a suitable aliquot should be preserved as soon as possible in the normal way. Any dilutions that result from addition of preservatives should be corrected for before submission of results.

Sample Preparation

All samples should be equilibrated at room temperature 20(±5)°C before any dilutions or analyses are performed. Samples should be prepared in accordance with the specific instructions for the sample. The dilutions specified should be conducted in such a way as to ensure that any errors introduced by this dilution are much smaller than the overall analytical error involved in your method. As a general rule it is suggested that the error from dilution should be less than 1%. Example dilutions are given for illustration to help clarify the meaning of the instructions. These procedures should be followed exactly to ensure comparability of results. **Any dilutions detailed as part of these procedures should not be used in the calculation of results. These dilutions simply provide a final sample for analysis within the expected concentration ranges.**

Diluents Used

The Sample Preparation Instructions refer to various different diluents. If the diluent required is anything other than deionised water it is supplied by Aquacheck. Diluents referred to/supplied are: 'Concentrated Effluent Matrix', 'Concentrated Chromium Effluent Matrix', 'Groundwater Sample', 'Matrix Water', 'Sample 1 & 2 Hard Water', 'Sample 1 & 2 Soft Water', 'Sample 4 Matrix', 'Sample 4G Matrix', 'Sample 5 Matrix', 'Sample 5A Matrix', 'Sample 5B Matrix', 'Sample 5G Matrix' and 'Sample 17C Metals'. Sometimes different spiking solutions in the same sample will use different diluents, e.g. Sample 1H and 1S Kjeldahl Nitrogen Spiking Solution requires dilution with deionised water, whereas Sample 1H and 1S Total Phosphorus Spiking Solution requires dilution with matrix water.

If an effluent concentrate is supplied, it must be diluted by a factor of 4 with deionised water before use.



Sample Preparation Instructions

Sample Analysis

Samples should be analysed by the normal methods used for those determinands by your laboratory.

Aquacheck samples should be treated like any other samples and all normal quality control procedures should be adopted.

Results should only be corrected for recovery and blank, if appropriate **and** if this is the normal practice in the laboratory. **If the sample is diluted as part of the analytical process (this is apart from the dilutions in the sample preparation instructions), such dilutions should be corrected for.**



Sample Preparation Instructions

Sample 1H

Materials Supplied

- 2 x 1L LDPE bottles containing hard matrix water (labelled as 'Sample 1 & 2 Hard Water')
- 2 x 30mL LDPE bottles containing spiking solutions for kjeldahl nitrogen and total phosphorus

N.B: The deionised water required for dilution of the kjeldahl nitrogen spiking solution is **NOT** supplied.

Preparation

Determinand	Bottle for analysis	Instruction
Calcium	Sample 1 & 2 Hard Water	Analyse as supplied
Magnesium	Sample 1 & 2 Hard Water	Analyse as supplied
Total Hardness	Sample 1 & 2 Hard Water	Analyse as supplied
Alkalinity	Sample 1 & 2 Hard Water	Analyse as supplied
Potassium	Sample 1 & 2 Hard Water	Analyse as supplied
Sodium	Sample 1 & 2 Hard Water	Analyse as supplied
Chloride	Sample 1 & 2 Hard Water	Analyse as supplied
Sulfate	Sample 1 & 2 Hard Water	Analyse as supplied
Fluoride	Sample 1 & 2 Hard Water	Analyse as supplied
Conductivity (20°C)	Sample 1 & 2 Hard Water	Analyse as supplied
Kjeldahl Nitrogen	Sample 1 KjN	Dilute spiking solution with deionised water by a factor of 100 (e.g. 1mL made up to 100mL)
Total Phosphorus	Sample 1 TP	Dilute spiking solution with matrix water by a factor of 100 (e.g. 1mL made up to 100mL)
Barium	Sample 1 & 2 Hard Water	Analyse as supplied

Do not correct the results for these dilutions.

Reporting

Both mS/cm and μ S/cm (at both 20 and 25°C) are available to participants as reporting units. However, results will be reported back to participants in μ S/cm (at 20°C)



Sample Preparation Instructions

Sample 1S

Materials Supplied

- 2 x 1L LDPE bottles containing soft matrix water (labelled as 'Sample 1 & 2 Soft Water')
- 2 x 30mL LDPE bottles containing spiking solutions for kjeldahl nitrogen and total phosphorus

N.B: The deionised water required for dilution of the kjeldahl nitrogen spiking solution is **NOT** supplied.

Preparation

Determinand	Bottle for analysis	Instruction
Calcium	Sample 1 & 2 Soft Water	Analyse as supplied
Magnesium	Sample 1 & 2 Soft Water	Analyse as supplied
Total Hardness	Sample 1 & 2 Soft Water	Analyse as supplied
Alkalinity	Sample 1 & 2 Soft Water	Analyse as supplied
Potassium	Sample 1 & 2 Soft Water	Analyse as supplied
Sodium	Sample 1 & 2 Soft Water	Analyse as supplied
Chloride	Sample 1 & 2 Soft Water	Analyse as supplied
Sulfate	Sample 1 & 2 Soft Water	Analyse as supplied
Fluoride	Sample 1 & 2 Soft Water	Analyse as supplied
Conductivity (20°C)	Sample 1 & 2 Soft Water	Analyse as supplied
Kjeldahl Nitrogen	Sample 1 KjN	Dilute spiking solution with deionised water by a factor of 100 (e.g. 1mL made up to 100mL)
Total Phosphorus	Sample 1 TP	Dilute spiking solution with matrix water by a factor of 100 (e.g. 1mL made up to 100mL)
Barium	Sample 1 & 2 Soft Water	Analyse as supplied

Do not correct the results for these dilutions.

Reporting

Both mS/cm and μ S/cm (at both 20 and 25°C) are available to participants as reporting units. However, results will be reported back to participants in μ S/cm (at 20°C)



Sample Preparation Instructions

Sample 1A

Materials Supplied

- 1 x 1L LDPE bottle containing spiked matrix water
- 1 x 25mL glass bottle containing spiking solution for TOC
- 1 x 500mL LDPE bottle containing sample for determination of pH

Preparation

Determinand	Bottle for analysis	Instruction
Sodium	Sample 1A Matrix	Analyse as supplied
Magnesium	Sample 1A Matrix	Analyse as supplied
Chloride	Sample 1A Matrix	Analyse as supplied
Sulfate	Sample 1A Matrix	Analyse as supplied
pH at 20-25°C	Sample 1A pH	Analyse as supplied at 20-25°C within 3 days of sample delivery
Conductivity (20°C)	Sample 1A Matrix	Analyse as supplied
Total Organic Carbon (TOC)	Sample 1A TOC	Dilute spiking solution with matrix water by a factor of 10 (e.g. 10mL made up to 100mL)
Total Dissolved Solids (180°C)	Sample 1A Matrix	Analyse as supplied

Do not correct the results for the TOC dilution.

Reporting

Both mS/cm and μ S/cm (at both 20 and 25°C) are available to participants as reporting units. However, results will be reported back to participants in μ S/cm (at 20°C)



Sample Preparation Instructions

Sample 2H

Materials Supplied

- 1 x 1L LDPE bottle containing hard matrix water (labelled as 'Sample 1 & 2 Hard Water')
- 7 x 30mL LDPE bottles (5 clear and 2 amber) containing spiking solutions for nitrite, ammonia, SR phosphorus, colour, permanganate index, total cyanide and free cyanide
- 1 x 500mL LDPE bottle containing sample for determination of pH and conductivity

N.B: The deionised water required for dilution of some spiking solutions is **NOT** supplied.

Preparation

Determinand	Bottle for analysis	Instruction
Total Oxidised Nitrogen (TON)	Sample 1 & 2 Hard Water	Analyse as supplied within 3 days of sample delivery
Silicate	Sample 1 & 2 Hard Water	Analyse as supplied
Nitrite	Sample 2 Nitrite	Dilute spiking solution with deionised water by a factor of 100 (e.g. 1mL made up to 100mL). Analyse within 3 days of sample delivery
Ammonia	Sample 2 Ammonia	Dilute spiking solution with matrix water by a factor of 100 (e.g. 1mL made up to 100mL). Analyse within 3 days of sample delivery
Soluble Reactive Phosphorus (SRP - PO ₄)	Sample 2 SRP	Dilute spiking solution with matrix water by a factor of 100 (e.g. 1mL made up to 100mL)
pH at 20-25°C	Sample 2 pH/conductivity	Analyse as supplied at 20-25°C within 3 days of sample delivery
Conductivity (20°C)	Sample 2 pH/conductivity	Analyse as supplied
Colour	Sample 2 Colour	Dilute spiking solution with deionised water by a factor of 10 (e.g. 10mL made up to 100mL). N.B. Do not perform a pH adjustment on this solution.
Permanganate Index (PI)	Sample 2 PI	Dilute spiking solution with deionised water by a factor of 10 (e.g. 10mL made up to 100mL)
Total Cyanide	Sample 2 Total Cyanide	Dilute spiking solution with matrix water by a factor of 100 (e.g. 1mL made up to 100mL)
Free Cyanide	Sample 2 Free Cyanide	Dilute spiking solution with matrix water by a factor of 100 (e.g. 1mL made up to 100mL)
Nitrate	Sample 1 & 2 Hard Water	Analyse as supplied within 3 days of sample delivery
Total Dissolved Solids	Sample 1 & 2 Hard Water	Analyse as supplied

Do not correct the results for these dilutions.

N.B: The cyanide spiking solutions contain cyanides and are prepared in 0.5% sodium hydroxide as a preservative.



Sample Preparation Instructions

Sample 2S

Materials Supplied

- 1 x 1L LDPE bottle containing soft matrix water (labelled as 'Sample 1 & 2 Soft Water')
- 8 x 30mL LDPE bottles (6 clear and 2 amber) containing spiking solutions for nitrite, nitrate, ammonia, SR phosphorus, colour, permanganate index, total cyanide and free cyanide
- 1 x 500mL LDPE bottle containing sample for determination of pH and conductivity

N.B: The deionised water required for dilution of some spiking solutions is **NOT** supplied.

Preparation

Determinand	Bottle for analysis	Instruction
Total Oxidised Nitrogen (TON)	Sample 1 & 2 Soft Water	Analyse as supplied within 3 days of sample delivery
Silicate	Sample 1 & 2 Soft Water	Analyse as supplied
Nitrite	Sample 2 Nitrite	Dilute spiking solution with deionised water by a factor of 100 (e.g. 1mL made up to 100mL). Analyse within 3 days of sample delivery
Ammonia	Sample 2 Ammonia	Dilute spiking solution with matrix water by a factor of 100 (e.g. 1mL made up to 100mL). Analyse within 3 days of sample delivery
Soluble Reactive Phosphorus (SRP - PO ₄)	Sample 2 SRP	Dilute spiking solution with matrix water by a factor of 100 (e.g. 1mL made up to 100mL)
pH at 20-25°C	Sample 2 pH/conductivity	Analyse as supplied at 20-25°C within 3 days of sample delivery
Conductivity (20°C)	Sample 2 pH/conductivity	Analyse as supplied
Colour	Sample 2 Colour	Dilute spiking solution with deionised water by a factor of 10 (e.g. 10mL made up to 100mL). N.B. Do not perform a pH adjustment on this solution.
Permanganate Index (PI)	Sample 2 PI	Dilute spiking solution with deionised water by a factor of 10 (e.g. 10mL made up to 100mL)
Total Cyanide	Sample 2 Total Cyanide	Dilute spiking solution with matrix water by a factor of 100 (e.g. 1mL made up to 100mL)
Free Cyanide	Sample 2 Free Cyanide	Dilute spiking solution with matrix water by a factor of 100 (e.g. 1mL made up to 100mL)
Nitrate	Sample 2 Nitrate	Dilute spiking solution with deionised water by a factor of 100 (e.g. 1mL made up to 100mL). Analyse within 3 days of sample delivery
Total Dissolved Solids	Sample 1 & 2 Soft Water	Analyse as supplied

Do not correct the results for these dilutions.

N.B: The cyanide spiking solutions contain cyanides and are prepared in 0.5% sodium hydroxide as a preservative.



Sample Preparation Instructions

Sample 2A

Materials Supplied

- 2 x 500mL LDPE bottles containing sample for determination of pH

Preparation

Determinand	Bottle for analysis	Instruction
pH at 20-25°C – Low	Sample 2A pH Low in Poorly Buffered Waters	Analyse as supplied at 20-25°C within 3 days of sample delivery
pH at 20-25°C – High	Sample 2A pH High in Poorly Buffered Waters	Analyse as supplied at 20-25°C within 3 days of sample delivery

NB: To avoid CO₂ contamination, do not expose to the atmosphere until the sample temperature is at 20-25°C.

The “pH High” samples are very susceptible to pH decreases on exposure to air. Therefore, special care is needed during the measurement process



Sample Preparation Instructions

Sample 3

Materials Supplied

- 6 x 30mL LDPE bottles containing spiking solutions for BOD, COD, MBAS, Non-ionic surfactants, DOC and turbidity
- 1 x 30mL PP bottle containing spiking solution for suspended solids

N.B: The deionised water required for dilution of these spiking solutions is **NOT** supplied, nor is the BOD seed or dilution water required for the BOD test.

Preparation

Determinand	Bottle for analysis	Instruction
BOD (5 day)	Sample 3 BOD	Dilute spiking solution with seeded dilution water by a factor of 1,000 (e.g. 1mL made up to 1,000mL). Alternatively, dilute with deionised water prior to adding seed so that the overall dilution factor is still 1,000
COD	Sample 3 COD	Dilute spiking solution with deionised water by a factor of 10 (e.g. 10mL made up to 100mL)
Suspended Solids	Sample 3 Suspended solids No. xxx	Wash all supplied spiking solution out of bottle and make up to 2L with deionised water
Methylene Blue Active Substances (MBAS)	Sample 3 MBAS	Dilute spiking solution with deionised water by a factor of 100 (e.g. 1mL made up to 100mL)
Non-ionic Surfactants	Sample 3 Non-ionic Surfactants	Dilute spiking solution with deionised water by a factor of 100 (e.g. 1mL made up to 100mL)
Dissolved Organic Carbon	Sample 3 DOC	Dilute spiking solution with deionised water by a factor of 100 (e.g. 1mL made up to 100mL)
Turbidity	Sample 3 Turbidity	Dilute spiking solution with deionised water by a factor of 10 (e.g. 10mL made up to 100mL)

Do not correct the results for these dilutions.

Aquacheck uses sodium lauryl sulphate as the anionic detergent but calculates the amount of active anion lauryl sulphate present to calculate the assigned value using the ratio of molecular weights.

Take particular care when using units for MBAS other than “MBAS as µg LS (MW 265) per litre” that the conversion factor used is correct. If the MBAS standard curve is created using an anionic detergent X with a molecular weight of M and the concentration axis has units of µgX/L the result will need to be multiplied by 265/M to convert it into Aquacheck units.



Sample Preparation Instructions

Sample 3A

Materials Supplied

- 4 x 30mL LDPE bottles containing spiking solutions for chlorate/chlorite (high and low levels), bromide and bromate

N.B: The deionised water required for the dilution of these spiking solutions is **NOT** supplied.

Preparation

Determinand	Bottle for analysis	Instruction
Bromide	Sample 3A Bromide	Dilute spiking solution with deionised water by a factor of 100 (e.g. 1mL made up to 100mL)
Bromate	Sample 3A Bromate	Dilute spiking solution with deionised water by a factor of 100 (e.g. 1mL made up to 100mL)
Chlorate (low level)	Sample 3A Chlorate/Chlorite (low level)	Dilute spiking solution with deionised water by a factor of 100 (e.g. 1mL made up to 100mL)
Chlorite (low level)	Sample 3A Chlorate/Chlorite (low level)	Dilute spiking solution with deionised water by a factor of 100 (e.g. 1mL made up to 100mL)
Chlorate (high level)	Sample 3A Chlorate/Chlorite (high level)	Dilute spiking solution with deionised water by a factor of 100 (e.g. 1mL made up to 100mL)
Chlorite (high level)	Sample 3A Chlorate/Chlorite (high level)	Dilute spiking solution with deionised water by a factor of 100 (e.g. 1mL made up to 100mL)

Do not correct the results for these dilutions.

Analyse solutions immediately following preparation.



Sample Preparation Instructions

Sample 3B

Materials Supplied

- 1 x 500mL glass bottle containing matrix water
- 1 x 10mL amber glass vial containing spiking solution for free chlorine
- 1 x 30mL plastic bottle to be used for mixing solutions

Preparation

Determinand	Bottle for analysis	Instruction
Free Chlorine	Sample 3B Free Chlorine	Mix the matrix water with the free chlorine spiking solution. Analyse the sample immediately by usual laboratory method

The following technique should be used when mixing solutions:

- ♦ Pour a small amount of the matrix water into the 30mL plastic bottle supplied.
- ♦ Empty the vial into the 500mL matrix water bottle.
- ♦ Rinse the vial into the 500mL matrix water bottle at least three times with the matrix water in the 30mL plastic bottle
- ♦ Pour any remaining matrix water from the 30mL plastic bottle back into the 500mL matrix water bottle
- ♦ Invert twenty times to ensure thorough mixing
- ♦ Analyse immediately using usual laboratory method

Samples must be analysed within three days of receipt.

Analyse solutions immediately following preparation.



Sample Preparation Instructions

Sample 3C

Materials Supplied

- 1 x 500mL glass bottle containing matrix water
- 1 x 10mL amber glass vial containing spiking solution for total chlorine
- 1 x 30mL plastic bottle to be used for mixing solutions

Preparation

Determinand	Bottle for analysis	Instruction
Total Chlorine	Sample 3C Total Chlorine	Mix the matrix water with the total chlorine spiking solution. Allow the sample to equilibrate for 15 minutes then analyse the sample immediately by usual laboratory method

The following technique should be used when mixing solutions:

- ♦ Pour a small amount of the matrix water into the 30mL plastic bottle supplied.
- ♦ Empty the vial into the 500mL matrix water bottle.
- ♦ Rinse the vial into the 500mL matrix water bottle at least three times with the matrix water in the 30mL plastic bottle
- ♦ Pour any remaining matrix water from the 30mL plastic bottle back into the 500mL matrix water bottle
- ♦ Invert twenty times to ensure thorough mixing
- ♦ Allow the sample to equilibrate for 15 minutes (± 30 seconds)
- ♦ Analyse immediately using usual laboratory method

Samples must be analysed within three days of receipt.

Analyse solutions immediately following preparation and the defined equilibration time.

N.B: The total chlorine is defined as the sum of the free and combined chlorine concentrations in the sample:

$$\text{Total chlorine} = \text{Free chlorine} + \text{Combined chlorine}$$



Sample Preparation Instructions

Sample 4

Materials Supplied

- 1 x 500mL LDPE bottle containing spiked matrix water preserved with 0.5% nitric acid
- 1 x 30mL LDPE bottle containing spiking solution for silver preserved with 0.5% nitric acid

Preparation

Determinand	Bottle for analysis	Instruction
Iron	Sample 4 Matrix	Analyse as supplied
Manganese	Sample 4 Matrix	Analyse as supplied
Copper	Sample 4 Matrix	Analyse as supplied
Aluminium	Sample 4 Matrix	Analyse as supplied
Zinc	Sample 4 Matrix	Analyse as supplied
Silver	Sample 4 Silver	Dilute spiking solution with Sample 4 Matrix water by a factor of 100 (e.g. 1mL made up to 100mL)
Barium	Sample 4 Matrix	Analyse as supplied
Boron	Sample 4 Matrix	Analyse as supplied
Strontium	Sample 4 Matrix	Analyse as supplied
Lithium	Sample 4 Matrix	Analyse as supplied

Do not correct the results for these dilutions.



Sample Preparation Instructions

Sample 4G

Materials Supplied

- 1 x 500mL LDPE bottle containing a spiked groundwater matrix preserved with 0.5% nitric acid
- 1 x 30mL LDPE bottle containing spiking solution for silver preserved with 0.5% nitric acid

Preparation

Determinand	Bottle for analysis	Instruction
Iron	Sample 4G Matrix	Analyse as supplied
Manganese	Sample 4G Matrix	Analyse as supplied
Copper	Sample 4G Matrix	Analyse as supplied
Aluminium	Sample 4G Matrix	Analyse as supplied
Zinc	Sample 4G Matrix	Analyse as supplied
Silver	Sample 4G Silver	Dilute spiking solution with Sample 4G Matrix water by a factor of 100 (e.g. 1mL made up to 100mL)
Barium	Sample 4G Matrix	Analyse as supplied
Boron	Sample 4G Matrix	Analyse as supplied
Strontium	Sample 4G Matrix	Analyse as supplied
Lithium	Sample 4G Matrix	Analyse as supplied

Do not correct the results for these dilutions.



Sample Preparation Instructions

Sample 5

Materials Supplied

- 1 x 500mL LDPE bottle containing spiked matrix water preserved with 0.5% nitric acid
- 1 x 30mL LDPE bottle containing spiking solution for mercury preserved with 0.5% nitric acid and 0.05% potassium dichromate
- 1 x 30mL LDPE bottle containing spiking solution for tin preserved with 0.5% nitric acid

Preparation

Determinand	Bottle for analysis	Instruction
Cadmium	Sample 5 Matrix	Analyse as supplied
Lead	Sample 5 Matrix	Analyse as supplied
Nickel	Sample 5 Matrix	Analyse as supplied
Selenium	Sample 5 Matrix	Analyse as supplied
Arsenic	Sample 5 Matrix	Analyse as supplied
Antimony	Sample 5 Matrix	Analyse as supplied
Mercury	Sample 5 Mercury	Dilute spiking solution with Sample 5 Matrix water by a factor of 100 (e.g. 1mL made up to 100mL)
Cobalt	Sample 5 Matrix	Analyse as supplied
Vanadium	Sample 5 Matrix	Analyse as supplied
Chromium	Sample 5 Matrix	Analyse as supplied
Molybdenum	Sample 5 Matrix	Analyse as supplied
Tin	Sample 5 Tin	Dilute spiking solution with Sample 5 Matrix water by a factor of 100 (e.g. 1mL made up to 100mL)
Beryllium	Sample 5 Matrix	Analyse as supplied

Do not correct the results for these dilutions.

The mercury sample should be treated as any other sample received by your laboratory e.g. addition of more acid or preservatives. Please correct for any changes in concentration produced by these additions.



Sample Preparation Instructions

Sample 5A

Materials Supplied

- 1 x 500mL LDPE bottle containing spiked water preserved with 0.5% hydrochloric acid

Preparation

Determinand	Bottle for analysis	Instruction
Arsenic	Sample 5A Matrix	Analyse as supplied
Selenium	Sample 5A Matrix	Analyse as supplied
Antimony	Sample 5A Matrix	Analyse as supplied
Tin	Sample 5A Matrix	Analyse as supplied



Sample Preparation Instructions

Sample 5B

Materials Supplied

- 1 x 500mL LDPE bottle containing spiked matrix water preserved with 0.5% nitric acid
- 1 x 30mL LDPE bottle containing spiking solution for mercury preserved with 0.5% nitric acid and 0.05% potassium dichromate

Preparation

Determinand	Bottle for analysis	Instruction
Cadmium	Sample 5B Matrix	Analyse as supplied
Copper	Sample 5B Matrix	Analyse as supplied
Total Chromium	Sample 5B Matrix	Analyse as supplied
Lead	Sample 5B Matrix	Analyse as supplied
Nickel	Sample 5B Matrix	Analyse as supplied
Zinc	Sample 5B Matrix	Analyse as supplied
Vanadium	Sample 5B Matrix	Analyse as supplied
Mercury	Sample 5B Mercury	Dilute spiking solution with Sample 5B Matrix water by a factor of 100 (e.g. 1 mL made up to 100mL)

Do not correct the results for these dilutions.

The mercury sample should be treated as any other sample received by your laboratory e.g. addition of more acid or preservatives. Please correct for any changes in concentration produced by these additions.



Sample Preparation Instructions

Sample 5C

Materials Supplied

- 1 x 30mL LDPE bottle containing spiking solution for Chromium (VI)

N.B: The deionised water required for the dilution of this spiking solution is **NOT** supplied.

Preparation

Determinand	Bottle for analysis	Instruction
Chromium (VI)	Sample 5C Chromium (VI)	Dilute spiking solution with deionised water by a factor of 1,000 (e.g. 1mL made up to 1L)

Do not correct the results for these dilutions.



Sample Preparation Instructions

Sample 5G

Materials Supplied

- 1 x 500mL LDPE bottle containing a spiked groundwater matrix preserved with 0.5% nitric acid
- 1 x 30mL LDPE bottle containing spiking solution for mercury preserved with 0.5% nitric acid and 0.05% potassium dichromate
- 1 x 30mL LDPE bottle containing spiking solution for tin preserved with 0.5% nitric acid

Preparation

Determinand	Bottle for analysis	Instruction
Cadmium	Sample 5G Matrix	Analyse as supplied
Lead	Sample 5G Matrix	Analyse as supplied
Nickel	Sample 5G Matrix	Analyse as supplied
Selenium	Sample 5G Matrix	Analyse as supplied
Arsenic	Sample 5G Matrix	Analyse as supplied
Antimony	Sample 5G Matrix	Analyse as supplied
Mercury	Sample 5G Mercury	Dilute spiking solution with Sample 5G Matrix water by a factor of 100 (e.g. 1mL made up to 100mL)
Cobalt	Sample 5G Matrix	Analyse as supplied
Vanadium	Sample 5G Matrix	Analyse as supplied
Chromium	Sample 5G Matrix	Analyse as supplied
Molybdenum	Sample 5G Matrix	Analyse as supplied
Tin	Sample 5G Tin	Dilute spiking solution with Sample 5G Matrix water by a factor of 100 (e.g. 1mL made up to 100mL)
Beryllium	Sample 5G Matrix	Analyse as supplied

Do not correct the results for these dilutions.

The mercury sample should be treated as any other sample received by your laboratory e.g. addition of more acid or preservatives. Please correct for any changes in concentration produced by these additions.



Sample Preparation Instructions

Sample 6A

Materials Supplied

- 1 x 10mL amber glass vial containing spiking solution of haloforms and chlorinated solvents in methanol
- 1 x 2L glass/PETG bottle containing groundwater

Preparation

Determinand	Bottle for analysis	Instruction
Chloroform	Sample 6A	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50 μ L to 500mL)
Bromodichloromethane	Sample 6A	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50 μ L to 500mL)
Dibromochloromethane	Sample 6A	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50 μ L to 500mL)
Bromoform	Sample 6A	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50 μ L to 500mL)
Trichloroethene	Sample 6A	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50 μ L to 500mL)
Tetrachloroethene	Sample 6A	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50 μ L to 500mL)
Carbon Tetrachloride	Sample 6A	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50 μ L to 500mL)
1,2-Dichloroethane	Sample 6A	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50 μ L to 500mL)

Do not correct the results for these dilutions.



Sample Preparation Instructions

Sample 6B

Materials Supplied

- 1 x 10mL amber glass vial containing spiking solution of phenols in methanol
- 1 x 2L PETG bottle containing groundwater

Preparation

Determinand	Bottle for analysis	Instruction
Phenol	Sample 6B	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50uL to 500mL)
2-Chlorophenol	Sample 6B	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50uL to 500mL)
4-Chlorophenol	Sample 6B	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50uL to 500mL)
3-Bromophenol	Sample 6B	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50uL to 500mL)
2,4-Dichlorophenol	Sample 6B	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50uL to 500mL)
2,4,6-Trichlorophenol	Sample 6B	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50uL to 500mL)
Pentachlorophenol	Sample 6B	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50uL to 500mL)
2,5-Dimethylphenol	Sample 6B	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50uL to 500mL)
3,5-Dimethylphenol	Sample 6B	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50uL to 500mL)
2-Methylphenol (o-cresol)	Sample 6B	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50uL to 500mL)
3-Methylphenol (m-cresol)	Sample 6B	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50uL to 500mL)
4-Methylphenol (p-cresol)	Sample 6B	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50uL to 500mL)
Total monosubstituted methylphenols	Sample 6B	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50uL to 500mL)

Do not correct the results for these dilutions.

The actual result for phenol index determination is not exactly equal to the sum of the individual components.



Sample Preparation Instructions

Sample 6C

Materials Supplied

- 1 x 10mL amber glass vial containing spiking solution of BTEX components in methanol
- 1 x 2L glass/PETG bottle containing groundwater

Preparation

Determinand	Bottle for analysis	Instruction
Benzene	Sample 6C	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Toluene	Sample 6C	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Ethylbenzene	Sample 6C	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Styrene	Sample 6C	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
o-Xylene	Sample 6C	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
m-Xylene	Sample 6C	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
p-Xylene	Sample 6C	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Total Xylene	Sample 6C	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
m- + p-Xylene	Sample 6C	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)

Do not correct the results for these dilutions.



Sample Preparation Instructions

Sample 7A

Materials Supplied

- 1 x 10mL amber glass vial containing spiking solution of organochlorine pesticides in methanol
- 1 x 2L PETG bottle containing groundwater

Preparation

Determinand	Bottle for analysis	Instruction
Endrin	Sample 7A	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Dieldrin	Sample 7A	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Aldrin	Sample 7A	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
p,p'-DDT	Sample 7A	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
o,p'-DDT	Sample 7A	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
p,p'-DDE	Sample 7A	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
o,p'-DDE	Sample 7A	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
p,p'-DDD	Sample 7A	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
o,p'-DDD (TDE)	Sample 7A	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Alpha Hexachlorocyclohexane	Sample 7A	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Beta Hexachlorocyclohexane	Sample 7A	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Delta Hexachlorocyclohexane	Sample 7A	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Lindane (gamma HCH)	Sample 7A	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Trifluralin	Sample 7A	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Alpha Endosulphan	Sample 7A	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Beta Endosulphan	Sample 7A	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Hexachlorobenzene	Sample 7A	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Heptachlor	Sample 7A	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Heptachlor Epoxide	Sample 7A	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Pentachlorobenzene	Sample 7A	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Pendimethalin	Sample 7A	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)



Sample Preparation Instructions

Cis-chlordane	Sample 7A	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Trans-chlordane	Sample 7A	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Methoxychlor	Sample 7A	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)

Do not correct the results for these dilutions.

Sample 7B

Materials Supplied

- 1 x 10mL amber glass vial containing spiking solution of chlorinated solvents in methanol
- 1 x 2L glass/PETG bottle containing groundwater

Preparation

Determinand	Bottle for analysis	Instruction
Hexachlorobutadiene	Sample 7B	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Carbon Tetrachloride	Sample 7B	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Tetrachloroethene	Sample 7B	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
1,2,4-Trichlorobenzene	Sample 7B	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Trichloroethene	Sample 7B	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
1,1,1-Trichloroethane	Sample 7B	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
1,3,5-Trichlorobenzene	Sample 7B	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
1,2,3-Trichlorobenzene	Sample 7B	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
1,2-Dichloroethane	Sample 7B	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Chloroform	Sample 7B	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)

Do not correct the results for these dilutions.



Sample Preparation Instructions

Sample 7C

Materials Supplied

- 2 x 10mL amber glass vial containing spiking solutions of polycyclic aromatic hydrocarbons in methanol
- 1 x 2L PETG bottle containing groundwater

Preparation

Determinand	Bottle for analysis	Instruction
Fluoranthene	Sample 7C1	Dilute spiking solution with groundwater by a factor of 1,000 (e.g. 500µL to 500mL)
Benzo(b)fluoranthene	Sample 7C1	Dilute spiking solution with groundwater by a factor of 1,000 (e.g. 500µL to 500mL)
Benzo(k)fluoranthene	Sample 7C1	Dilute spiking solution with groundwater by a factor of 1,000 (e.g. 500µL to 500mL)
Benz(a)pyrene	Sample 7C1	Dilute spiking solution with groundwater by a factor of 1,000 (e.g. 500µL to 500mL)
Benzo(ghi)perylene	Sample 7C1	Dilute spiking solution with groundwater by a factor of 1,000 (e.g. 500µL to 500mL)
Indeno(1,2,3-cd)pyrene	Sample 7C1	Dilute spiking solution with groundwater by a factor of 1,000 (e.g. 500µL to 500mL)
Acenaphthene	Sample 7C2	Dilute spiking solution with groundwater by a factor of 1,000 (e.g. 500µL to 500mL)
Acenaphthylene	Sample 7C2	Dilute spiking solution with groundwater by a factor of 1,000 (e.g. 500µL to 500mL)
Anthracene	Sample 7C2	Dilute spiking solution with groundwater by a factor of 1,000 (e.g. 500µL to 500mL)
Benz(a)anthracene	Sample 7C2	Dilute spiking solution with groundwater by a factor of 1,000 (e.g. 500µL to 500mL)
Chrysene	Sample 7C2	Dilute spiking solution with groundwater by a factor of 1,000 (e.g. 500µL to 500mL)
Dibenz(ah)anthracene	Sample 7C2	Dilute spiking solution with groundwater by a factor of 1,000 (e.g. 500µL to 500mL)
Fluorene	Sample 7C2	Dilute spiking solution with groundwater by a factor of 1,000 (e.g. 500µL to 500mL)
Naphthalene	Sample 7C2	Dilute spiking solution with groundwater by a factor of 1,000 (e.g. 500µL to 500mL)
Perylene	Sample 7C2	Dilute spiking solution with groundwater by a factor of 1,000 (e.g. 500µL to 500mL)
Phenanthrene	Sample 7C2	Dilute spiking solution with groundwater by a factor of 1,000 (e.g. 500µL to 500mL)
Pyrene	Sample 7C2	Dilute spiking solution with groundwater by a factor of 1,000 (e.g. 500µL to 500mL)

Do not correct the results for these dilutions.

N.B. To ensure the full solubility of the analytes in this sample, sub-stock solutions are prepared in hexane as part of the production process. The maximum level of this interferant will be 0.6%



Sample Preparation Instructions

Sample 7D

Materials Supplied

- 1 x 10mL amber glass vial containing spiking solution of polychlorinated biphenyls in methanol
- 1 x 2L PETG bottle containing groundwater

Preparation

Determinand	Bottle for analysis	Instruction
PCB (28)	Sample 7D	Dilute spiking solution with groundwater by a factor of 1,000 (e.g. 500µL to 500mL)
PCB (52)	Sample 7D	Dilute spiking solution with groundwater by a factor of 1,000 (e.g. 500µL to 500mL)
PCB (101)	Sample 7D	Dilute spiking solution with groundwater by a factor of 1,000 (e.g. 500µL to 500mL)
PCB (118)	Sample 7D	Dilute spiking solution with groundwater by a factor of 1,000 (e.g. 500µL to 500mL)
PCB (138)	Sample 7D	Dilute spiking solution with groundwater by a factor of 1,000 (e.g. 500µL to 500mL)
PCB (153)	Sample 7D	Dilute spiking solution with groundwater by a factor of 1,000 (e.g. 500µL to 500mL)
PCB (180)	Sample 7D	Dilute spiking solution with groundwater by a factor of 1,000 (e.g. 500µL to 500mL)

Do not correct the results for these dilutions

N.B. To ensure the full solubility of the analytes in this sample, sub-stock solutions are prepared in hexane as part of the production process. The maximum level of this interferant will be 0.75%



Sample Preparation Instructions

Sample 8

Materials Supplied

- 2 x 10mL amber glass vial containing spiking solution of acid herbicides in methanol
 - Spike 8(1) contains all determinands except glyphosate and AMPA
 - Spike 8(2) contains glyphosate and AMPA
- 1 x 2L PETG bottle containing groundwater

Preparation

Determinand	Bottle for analysis	Instruction
MCPA	Sample 8(1)	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
MCPB	Sample 8(1)	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
2,4-D	Sample 8(1)	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Dichlorprop	Sample 8(1)	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Dicamba	Sample 8(1)	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
2,4-DB	Sample 8(1)	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Bentazone	Sample 8(1)	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Mecoprop	Sample 8(1)	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Propyzamide	Sample 8(1)	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Ioxynil	Sample 8(1)	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Bromoxynil	Sample 8(1)	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Triclopyr	Sample 8(1)	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Clopyralid	Sample 8(1)	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Fluroxypyr	Sample 8(1)	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
2,3,6-TBA	Sample 8(1)	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
2,4,5-T	Sample 8(1)	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Dichlobenil	Sample 8(1)	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Bromacil	Sample 8(1)	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Metazachlor	Sample 8(1)	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Propachlor	Sample 8(1)	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)

Sample 8 – continued



Sample Preparation Instructions

Determinand	Bottle for analysis	Instruction
Benazolin	Sample 8(1)	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
2,4,5-TP (Fenoprop)	Sample 8(1)	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Metaldehyde	Sample 8(1)	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Glyphosate	Sample 8(2)	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
AMPA	Sample 8(2)	Dilute spiking solution with groundwater by a factory of 10,000 (e.g. 50µL to 500mL)

Do not correct the results for these dilutions.



Sample Preparation Instructions

Sample 8B

Materials Supplied

- 2 x 10mL amber glass vial containing spiking solution of triazines and urea herbicides in methanol
 - Spike 8B(1) contains analytes isoproturon to metamitron
 - Spike 8B(2) contains analytes simazine to pirimicarb
- 1 x 2L PETG bottle containing groundwater

Preparation

Determinand	Bottle for analysis	Instruction
Isoproturon	Sample 8B(1)	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Diuron	Sample 8B(1)	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Linuron	Sample 8B(1)	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Chlortoluron	Sample 8B(1)	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Monuron	Sample 8B(1)	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Methabenzthiazuron	Sample 8B(1)	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Diflufenican	Sample 8B(1)	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Metamitron	Sample 8B(1)	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Simazine	Sample 8B(2)	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Atrazine	Sample 8B(2)	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Propazine	Sample 8B(2)	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Cyanazine	Sample 8B(2)	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Trietazine	Sample 8B(2)	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Prometryn	Sample 8B(2)	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Terbutryn	Sample 8B(2)	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Ametryn	Sample 8B(2)	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Carbetamide	Sample 8B(2)	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Pirimicarb	Sample 8B(2)	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)

Do not correct the results for these dilutions.



Sample Preparation Instructions

Sample 9

Materials Supplied

- 1 x 10mL amber glass vial containing spiking solution of organophosphorus pesticides in methanol
- 1 x 2L PETG bottle containing groundwater

Preparation

Determinand	Bottle for analysis	Instruction
Azinphos-methyl	Sample 9	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Azinphos-ethyl	Sample 9	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Dichlorvos	Sample 9	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Fenitrothion	Sample 9	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Malathion	Sample 9	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Mevinphos	Sample 9	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Chlorfenvinphos	Sample 9	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Diazinon	Sample 9	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Fenthion	Sample 9	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Parathion-ethyl	Sample 9	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Parathion-methyl	Sample 9	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Chlorpyrifos	Sample 9	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Cypermethrin	Sample 9	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)
Propetamphos	Sample 9	Dilute spiking solution with groundwater by a factor of 10,000 (e.g. 50µL to 500mL)

Do not correct the results for these dilutions.

N.B. Chlorfenvinphos is a mixture of the Z and E isomers. The total concentration of these two isomers should be reported.



Sample Preparation Instructions

Sample 10

Materials Supplied

- 6 x 30mL LDPE bottles containing spiking solutions for nitrate, nitrite, ammonia, silicate, SR phosphorus, chloride, total cyanide, free cyanide, kjeldahl nitrogen and total phosphorus

N.B: The deionised water required for dilution of these spiking solutions is **NOT** supplied.

Preparation

Determinand	Bottle for analysis	Instruction
Total Oxidised Nitrogen (TON)	Sample 10 Nitrate/Nitrite/Ammonia	Dilute spiking solution with deionised water by a factor of 20 (e.g. 5mL made up to 100mL)
Nitrate	Sample 10 Nitrate/Nitrite/Ammonia	Dilute spiking solution with deionised water by a factor of 20 (e.g. 5mL made up to 100mL)
Nitrite	Sample 10 Nitrate/Nitrite/Ammonia	Dilute spiking solution with deionised water by a factor of 20 (e.g. 5mL made up to 100mL)
Ammonia	Sample 10 Nitrate/Nitrite/Ammonia	Dilute spiking solution with deionised water by a factor of 20 (e.g. 5mL made up to 100mL)
Silicate	Sample 10 Silicate	Dilute spiking solution with deionised water by a factor of 10 (e.g. 10mL made up to 100mL)
Soluble Reactive Phosphorus (SRP - PO ₄)	Sample 10 SRP/Chloride	Dilute spiking solution with deionised water by a factor of 20 (e.g. 5mL made up to 100mL)
Chloride	Sample 10 SRP/Chloride	Dilute spiking solution with deionised water by a factor of 20 (e.g. 5mL made up to 100mL)
Total Cyanide	Sample 10 Total Cyanide	Dilute spiking solution with deionised water by a factor of 20 (e.g. 5mL made up to 100mL)
Kjeldahl Nitrogen	Sample 10 KjN/Total P	Dilute spiking solution with deionised water by a factor of 20 (e.g. 5mL made up to 100mL)
Free Cyanide	Sample 10 Free Cyanide	Dilute spiking solution with deionised water by a factor of 20 (e.g. 5mL made up to 100mL)
Total Nitrogen	Sum of nitrogen content from Sample 10 Nitrate/Nitrite/Ammonia and Sample 10 KjN/Total P bottle	Dilute appropriate spiking solutions with deionised water by a factor of 20 (e.g. 5mL made up to 100mL). N.B. the ammonia contribution will come from the nitrate/nitrite/ammonia sample, the KjN sample does NOT contain any ammonia.
Total Phosphorus	Sample 10 KjN/Total P	Dilute spiking solution with deionised water by a factor of 20 (e.g. 5mL made up to 100mL)

Do not correct the results for these dilutions.

N.B: The cyanide spiking solutions contain cyanides, and are prepared in 0.5% sodium hydroxide as a preservative.



Sample Preparation Instructions

Sample 11

Materials Supplied

- 4 x 30mL LDPE bottles containing spiking solutions for BOD, COD, MBAS and TOC/DOC
- 1 x 125mL LDPE bottle containing solution for turbidity
- 1 x 30mL PP bottle containing spiking solution for suspended solids

N.B: The deionised water required for dilution of these spiking solutions is **NOT** supplied, nor is the BOD seed or dilution water required for the BOD test.

Preparation

Determinand	Bottle for analysis	Instruction
BOD (5 day)	Sample 11 BOD	Dilute spiking solution with seeded dilution water by a factor of 20 (e.g. 5mL made up to 100mL)
COD	Sample 11 COD	Dilute spiking solution with deionised water by a factor of 10 (e.g. 10mL made up to 100mL)
Suspended Solids	Sample 11 Suspended Solids No. xxx	Wash all the supplied spiking solution out of the bottle and make up to 2L with deionised water
Methylene Blue Active Substances (MBAS)	Sample 11 MBAS	Dilute spiking solution with deionised water by a factor of 20 (e.g. 5mL made up to 100mL)
Dissolved/Total Organic Carbon	Sample 11 DOC/TOC	Dilute spiking solution with deionised water by a factor of 4 (e.g. 5mL made up to 20mL)
Turbidity	Sample 11 Turbidity	Analyse as supplied
Non-ionic surfactants	Sample 11 Non-ionic surfactants	Dilute spiking solution with deionised water by a factor of 100 (e.g. 1mL made up to 100mL)

Do not correct the results for these dilutions.

Aquacheck uses sodium lauryl sulphate as the anionic detergent but calculates the amount of active anion lauryl sulphate present to calculate the assigned value using the ratio of molecular weights.

Take particular care when using units for MBAS other than “MBAS as mg LS (MW 265) per litre” that the conversion factor used is correct. If the MBAS standard curve is created using an anionic detergent X with a molecular weight of M and the concentration axis has units of mgX/L the result will need to be multiplied by 265/M to convert it into Aquacheck units.



Sample Preparation Instructions

Sample 12

Materials Supplied

- 1 x 250mL LDPE bottle containing concentrated effluent matrix preserved with 0.5% nitric acid
- 1 x 125mL LDPE bottle containing spiking solution for metals preserved with 0.5% nitric acid
- 1 x 30mL LDPE bottle containing spiking solution for mercury preserved with 0.5% nitric acid and 0.05% potassium dichromate

Preparation

- Dilute the concentrated effluent matrix water with deionised water by a factor of 4 (e.g. 25mL made up to 100mL) before use (the deionised water required for this is NOT provided)

Determinand	Bottle for analysis	Instruction
Antimony	Sample 12 Metals	Dilute metals solution with effluent water by a factor of 20 (e.g. 5mL made up to 100mL)
Arsenic	Sample 12 Metals	Dilute metals solution with effluent water by a factor of 20 (e.g. 5mL made up to 100mL)
Aluminium	Sample 12 Metals	Dilute metals solution with effluent water by a factor of 20 (e.g. 5mL made up to 100mL)
Chromium	Sample 12 Metals	Dilute metals solution with effluent water by a factor of 20 (e.g. 5mL made up to 100mL)
Iron	Sample 12 Metals	Dilute metals solution with effluent water by a factor of 20 (e.g. 5mL made up to 100mL)
Manganese	Sample 12 Metals	Dilute metals solution with effluent water by a factor of 20 (e.g. 5mL made up to 100mL)
Cadmium	Sample 12 Metals	Dilute metals solution with effluent water by a factor of 20 (e.g. 5mL made up to 100mL)
Copper	Sample 12 Metals	Dilute metals solution with effluent water by a factor of 20 (e.g. 5mL made up to 100mL)
Lead	Sample 12 Metals	Dilute metals solution with effluent water by a factor of 20 (e.g. 5mL made up to 100mL)
Nickel	Sample 12 Metals	Dilute metals solution with effluent water by a factor of 20 (e.g. 5mL made up to 100mL)
Zinc	Sample 12 Metals	Dilute metals solution with effluent water by a factor of 20 (e.g. 5mL made up to 100mL)
Mercury	Sample 12 Mercury	Dilute mercury spiking solution with effluent water by a factor of 20 (e.g. 5mL made up to 100mL)
Selenium	Sample 12 Metals	Dilute metals solution with effluent water by a factor of 20 (e.g. 5mL made up to 100mL)
Molybdenum	Sample 12 Metals	Dilute metals solution with effluent water by a factor of 20 (e.g. 5mL made up to 100mL)
Tellurium	Sample 12 Metals	Dilute metals solution with effluent water by a factor of 20 (e.g. 5mL made up to 100mL)
Uranium	Sample 12 Metals	Dilute metals solution with effluent water by a factor of 20 (e.g. 5mL made up to 100mL)

Do not correct the results for these dilutions.

The mercury sample should be treated as any other sample received by your laboratory e.g. addition of more acid or preservatives. Please correct for any changes in concentration produced by these additions.



Sample Preparation Instructions

Sample 12C

Materials Supplied

- 1 x 30mL LDPE bottle containing spiking solution for chromium (VI)
- 1 x 500mL LDPE bottle containing concentrated chromium effluent matrix water

Preparation

- Dilute the concentrated chromium effluent matrix water with deionised water by a factor of 4 (e.g. 25mL made up to 100mL) before use (the deionised water required for this is NOT provided)

Determinand	Bottle for analysis	Instruction
Chromium (VI)	Sample 12C Chromium (VI)	Dilute spiking solution with chromium effluent water by a factor of 100 (e.g. 1mL made up to 100mL)

Do not correct the results for these dilutions.



Sample Preparation Instructions

Sample 13

Materials Supplied

- 1 x plastic bottle containing approximately 20g of air dried sewage sludge

Preparation

Determinand	Bottle for Analysis	Instruction
Arsenic	Sample 13 Sewage Sludge	Analyse as supplied
Cadmium	Sample 13 Sewage Sludge	Analyse as supplied
Chromium	Sample 13 Sewage Sludge	Analyse as supplied
Copper	Sample 13 Sewage Sludge	Analyse as supplied
Lead	Sample 13 Sewage Sludge	Analyse as supplied
Mercury	Sample 13 Sewage Sludge	Analyse as supplied
Molybdenum	Sample 13 Sewage Sludge	Analyse as supplied
Nickel	Sample 13 Sewage Sludge	Analyse as supplied
Vanadium	Sample 13 Sewage Sludge	Analyse as supplied
Zinc	Sample 13 Sewage Sludge	Analyse as supplied
Selenium	Sample 13 Sewage Sludge	Analyse as supplied
Total Boron	Sample 13 Sewage Sludge	Analyse as supplied
Fluoride	Sample 13 Sewage Sludge	Analyse as supplied
Total Nitrogen	Sample 13 Sewage Sludge	Analyse as supplied
Total Phosphorus	Sample 13 Sewage Sludge	Analyse as supplied
Total Potassium	Sample 13 Sewage Sludge	Analyse as supplied
Cobalt	Sample 13 Sewage Sludge	Analyse as supplied
Iron	Sample 13 Sewage Sludge	Analyse as supplied
Manganese	Sample 13 Sewage Sludge	Analyse as supplied

N.B. Analyse the sample and report results based on the air dry weight of sludge as received.



Sample Preparation Instructions

Sample 14

Materials Supplied

- 1 x plastic bottle containing approximately 100g of air dried, sieved soil

Preparation

Determinand	Bottle for Analysis	Instruction
Arsenic	Sample 14 Soil	Analyse as supplied
Cadmium	Sample 14 Soil	Analyse as supplied
Chromium	Sample 14 Soil	Analyse as supplied
Copper	Sample 14 Soil	Analyse as supplied
Lead	Sample 14 Soil	Analyse as supplied
Mercury	Sample 14 Soil	Analyse as supplied
Molybdenum	Sample 14 Soil	Analyse as supplied
Nickel	Sample 14 Soil	Analyse as supplied
Vanadium	Sample 14 Soil	Analyse as supplied
Zinc	Sample 14 Soil	Analyse as supplied
Selenium	Sample 14 Soil	Analyse as supplied
Total Boron	Sample 14 Soil	Analyse as supplied
Water Extractable Boron	Sample 14 Soil	Analyse as supplied
Fluoride	Sample 14 Soil	Analyse as supplied
Total Nitrogen	Sample 14 Soil	Analyse as supplied
Total Phosphorus	Sample 14 Soil	Analyse as supplied
Total Potassium	Sample 14 Soil	Analyse as supplied
Cobalt	Sample 14 Soil	Analyse as supplied
Iron	Sample 14 Soil	Analyse as supplied
Manganese	Sample 14 Soil	Analyse as supplied
Total Solids	Sample 14 Soil	Analyse as supplied
Loss on Ignition	Sample 14 Soil	Analyse as supplied
pH at 20-25°C	Sample 14 Soil	Analyse as supplied
Extractable Phosphorus	Sample 14 Soil	Analyse as supplied
Extraction of Potassium	Sample 14 Soil	Analyse as supplied
Extraction of Magnesium	Sample 14 Soil	Analyse as supplied
Extraction of Sodium	Sample 14 Soil	Analyse as supplied
Organic Carbon Content	Sample 14 Soil	Analyse as supplied
Conductivity (20°C)	Sample 14 Soil	Analyse as supplied
Carbonate Content	Sample 14 Soil	Analyse as supplied

N.B. Analyse the soil using the usual laboratory method and report results based on the air dry weight of the soil as received.



Sample Preparation Instructions

Sample 15

Materials Supplied

- 1 x 1L LDPE bottle containing sample for settleable solids determination.

Preparation

Determinand	Bottle for analysis	Instruction
Settleable Solids	Sample 15 Settleable Solids	Shake well and analyse the whole sample (or ensure a representative sample is taken) and analyse for settleable solids using your usual method.

N.B. The method this sample is intended to test was the Standard Methods for the Examination of Water and Wastewater Method 2540, using an Imhoff cone, or similar.

Sample 16

Materials Supplied

- 1 x glass jar containing approximately 50g real sewage sludge

Preparation

Determinand	Bottle for Analysis	Instruction
Total Solids (105±5C)	Sample 16 Sewage Sludge	Analyse as supplied
Loss on Ignition (500±5C)	Sample 16 Sewage Sludge	Analyse as supplied
pH at 20-25C	Sample 16 Sewage Sludge	Analyse as supplied
Calcium	Sample 16 Sewage Sludge	Analyse as supplied
Magnesium	Sample 16 Sewage Sludge	Analyse as supplied

N.B. Results for calcium and magnesium should be reported as mg/kg dried weight, i.e. after drying at 105°C

Please ensure that you quote the Loss on Ignition of the total solid content. The calculations should follow:

- **% Total Solids @ 105°C = (Dried weight @ 105°C /Original weight) x 100**
- **% Loss on ignition @ 500°C = ((Dried weight @ 105°C – Weight remaining after ignition)/Dried weight @105°C) x 100**

e.g. If in a 100g sample, the weight of solids after drying at 105°C was 37.57g, giving Total Solids Content of 37.57%. From the 37.57g of solid material, 17.4g of solid was volatile at 500°C, giving a Loss on Ignition of 46.31%



Sample Preparation Instructions

Sample 17A

Materials Supplied

- 1 x 1L LDPE bottle containing synthetic wastewater

Preparation

N.B: Determine suspended solids **BEFORE** other determinations

Determinand	Bottle for Analysis	Instruction
pH at 20-25°C	Sample 17A No xxx	Analyse sample as supplied at 20-25°C within 3 days of sample delivery
Settled COD	Sample 17A No xxx	Allow bottle to settle for 30 minutes after shaking vigorously before sampling
Total COD	Sample 17A No xxx	Shake bottle vigorously and sample immediately
Suspended Solids	Sample 17A No xxx	Analyse for this determinand first. Shake bottle vigorously and sample immediately
Conductivity (20°C)	Sample 17A No xxx	Analyse as supplied
Total dissolved solids (180°C)	Sample 17A No xxx	Analyse as supplied
Non Filterable COD	Sample 17A No xxx	Analyse as supplied
Salinity	Sample 17A No xxx	Analyse as supplied

N.B: If determining settled or non filterable COD **and** total COD it is important that the sample for total COD or non filterable COD is taken first. Taking the settled COD sample first will affect the results.

Non filterable COD is the COD in the sample that is not removed by filtration it is therefore practically equivalent to “dissolved COD”

Reporting

Both mS/cm and μ S/cm (at both 20 and 25°C) are available to participants as reporting units. However, results will be reported back to participants in mS/cm (at 20°C)



Sample Preparation Instructions

Sample 17B

Materials Supplied

- 1 x 125mL LDPE bottle containing sample for the determination of total phenol
- 1 x 125mL LDPE bottle containing sample for the determination of sulfate
- 1 x 125mL LDPE bottle containing sample for the determination of cyanide

Preparation

Determinand	Bottle for Analysis	Instruction
Total Phenol	Sample 17B Total Phenol	Analyse as supplied
Cyanide	Sample 17B Cyanide	Analyse as supplied
Sulfate	Sample 17B Sulfate	Analyse as supplied

N.B. Cyanide spiking solutions contain cyanides, and are prepared in 0.5% sodium hydroxide as a preservative.

The matrix containing phenol is acidified with 0.5% nitric acid to ensure sample stability in transit. If necessary, it may be neutralised with sodium carbonate after dilution and immediately prior to testing.

Participants should be aware that prolonged exposure to the atmosphere could lead to sample instability.



Sample Preparation Instructions

Sample 17C

Materials Supplied

- 1 x 250mL LDPE bottle containing spiked synthetic wastewater sample
- 1 x 30mL LDPE bottle containing spiking solution for mercury preserved with 0.5% nitric acid and 0.05% potassium dichromate
- 1 x 30mL LDPE bottle containing spiking solution for silver preserved with 0.5% nitric acid
- 1 x 30mL LDPE bottle containing spiking solution for tin preserved with 0.5% nitric acid

Preparation

Determinand	Bottle for Analysis	Instruction
Aluminium	Sample 17C Metals	Analyse as supplied
Antimony	Sample 17C Metals	Analyse as supplied
Arsenic	Sample 17C Metals	Analyse as supplied
Barium	Sample 17C Metals	Analyse as supplied
Boron	Sample 17C Metals	Analyse as supplied
Cadmium	Sample 17C Metals	Analyse as supplied
Chromium	Sample 17C Metals	Analyse as supplied
Cobalt	Sample 17C Metals	Analyse as supplied
Copper	Sample 17C Metals	Analyse as supplied
Iron	Sample 17C Metals	Analyse as supplied
Lead	Sample 17C Metals	Analyse as supplied
Manganese	Sample 17C Metals	Analyse as supplied
Molybdenum	Sample 17C Metals	Analyse as supplied
Mercury	Sample 17C Mercury	Dilute spiking solution with Sample 17C Metals by a factor of 20 (e.g. 1mL made up to 20mL)
Nickel	Sample 17C Metals	Analyse as supplied
Selenium	Sample 17C Metals	Analyse as supplied
Silver	Sample 17C Silver	Dilute spiking solution with Sample 17C Metals by a factor of 20 (e.g. 1mL made up to 20mL)

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Sample Preparation Instructions

Sample 17C – continued

Determinand	Bottle for Analysis	Instruction
Tin	Sample 17C Tin	Dilute spiking solution with Sample 17C Metals by a factor of 20 (e.g. 1mL made up to 20mL)
Vanadium	Sample 17C Metals	Analyse as supplied
Zinc	Sample 17C Metals	Analyse as supplied

Do not correct the results for these dilutions

The mercury sample should be treated as any other sample received by your laboratory e.g. addition of more acid or preservatives. Please correct for any changes in concentration produced by these additions.

Participants should be aware of possible sample instability after dilution of tin spike with matrix water. Samples should be analysed promptly after dilution.



Sample Preparation Instructions

Sample 17D

Materials Supplied

- 1 x 125mL LDPE bottle containing solution for the determination of ammonia and SR phosphorus
- 1 x 125mL LDPE bottle containing solution for the determination of total nitrogen
- 1 x 125mL LDPE bottle containing solution for the determination of total phosphorus

Preparation

Determinand	Bottle for Analysis	Instruction
Ammonia	Sample 17D Ammonia & SRP	Analyse as supplied
Soluble Reactive Phosphorus (SRP - PO ₄)	Sample 17D Ammonia & SRP	Analyse as supplied
Total Phosphorus	Sample 17D Total P	Analyse as supplied
Total Nitrogen	Sample 17D Total N	Analyse as supplied

N.B: The total nitrogen solution includes ammonia, nitrate and organic nitrogen forms comprising a mixture of urea and nicotinamide.

Reporting

The total nitrogen result reported must **not** include the ammonia result from the ammonia/SRP sample.



Sample Preparation Instructions

Sample 18A

Materials Supplied

- 1 x 10mL amber glass vial containing spiking solution of haloforms and chlorinated solvents in methanol
- 1 x 500mL glass bottle containing concentrated effluent water

Preparation

- Dilute the concentrated effluent matrix water with deionised water by a factor of 4 (e.g. 25mL made up to 100mL) before use (deionised water NOT provided)

Determinand	Bottle for Analysis	Instruction
Chloroform	Sample 18A	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Bromodichloromethane	Sample 18A	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Dibromochloromethane	Sample 18A	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Bromoform	Sample 18A	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Trichloroethene	Sample 18A	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Tetrachloroethene	Sample 18A	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Carbon Tetrachloride	Sample 18A	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
1,2-Dichloroethane	Sample 18A	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)

Do not correct the results for these dilutions

The matrix is acidified with 0.5% nitric acid to ensure sample stability in transit if necessary it may be neutralised with sodium carbonate after dilution and immediately prior to spiking.



Sample Preparation Instructions

Sample 18B

Materials Supplied

- 1 x 10mL amber glass vial containing spiking solution of phenols in methanol
- 1 x 500mL glass bottle containing concentrated effluent water

Preparation

- Dilute the concentrated effluent matrix water with deionised water by a factor of 4 (e.g. 25mL made up to 100mL) before use (deionised water NOT provided)

Determinand	Bottle for analysis	Instruction
Phenol	Sample 18B	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
2-Chlorophenol	Sample 18B	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
4-Chlorophenol	Sample 18B	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
3-Bromophenol	Sample 18B	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
2,4-Dichlorophenol	Sample 18B	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
2,4,6-Trichlorophenol	Sample 18B	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Pentachlorophenol	Sample 18B	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
2,5-Dimethylphenol	Sample 18B	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
3,5-Dimethylphenol	Sample 18B	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
2-Methylphenol (o-cresol)	Sample 18B	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
3-Methylphenol (m-cresol)	Sample 18B	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
4-Methylphenol (p-cresol)	Sample 18B	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Total monosubstituted methylphenols	Sample 18B	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)

Do not correct the results for these dilutions

The matrix is acidified with 0.5% nitric acid to ensure sample stability in transit if necessary it may be neutralised with sodium carbonate after dilution and immediately prior to spiking.

The actual result for phenol index determination is not exactly equal to the sum of the individual components.



Sample Preparation Instructions

Sample 18C

Materials Supplied

- 1 x 10mL amber glass vial containing spiking solution of BTEX components in methanol
- 1 x 500mL glass bottle containing concentrated effluent water

Preparation

- Dilute the concentrated effluent matrix water with deionised water by a factor of 4 (e.g. 25mL made up to 100mL) before use (deionised water NOT provided)

Determinand	Bottle for Analysis	Instruction
Benzene	Sample 18C	Dilute spiking solution with effluent water by a factor of 500 (e.g. 1mL to 500mL)
Toluene	Sample 18C	Dilute spiking solution with effluent water by a factor of 500 (e.g. 1mL to 500mL)
Ethylbenzene	Sample 18C	Dilute spiking solution with effluent water by a factor of 500 (e.g. 1mL to 500mL)
Styrene	Sample 18C	Dilute spiking solution with effluent water by a factor of 500 (e.g. 1mL to 500mL)
o-Xylene	Sample 18C	Dilute spiking solution with effluent water by a factor of 500 (e.g. 1mL to 500mL)
m-Xylene	Sample 18C	Dilute spiking solution with effluent water by a factor of 500 (e.g. 1mL to 500mL)
p-Xylene	Sample 18C	Dilute spiking solution with effluent water by a factor of 500 (e.g. 1mL to 500mL)
Total Xylene	Sample 18C	Dilute spiking solution with effluent water by a factor of 500 (e.g. 1mL to 500mL)
m- + p-Xylene	Sample 18C	Dilute spiking solution with effluent water by a factor of 500 (e.g. 1mL to 500mL)

Do not correct the results for these dilutions

The matrix is acidified with 0.5% nitric acid to ensure sample stability in transit if necessary it may be neutralised with sodium carbonate after dilution and immediately prior to spiking.



Sample Preparation Instructions

Sample 19A

Materials Supplied

- 1 x 10mL amber glass vial containing spiking solution of organochlorine pesticides in methanol
- 1 x 500mL glass bottle containing concentrated effluent water

Preparation

- Dilute the concentrated effluent matrix water with deionised water by a factor of 4 (e.g. 25mL made up to 100mL) before use (deionised water NOT provided)
-

Determinand	Bottle for Analysis	Instruction
Endrin	Sample 19A	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Dieldrin	Sample 19A	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Aldrin	Sample 19A	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
p,p'-DDT	Sample 19A	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
o,p'-DDT	Sample 19A	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
p,p'-DDE	Sample 19A	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
o,p'-DDE	Sample 19A	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
p,p'-DDD	Sample 19A	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
o,p'-DDD (TDE)	Sample 19A	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Alpha Hexachlorocyclohexane	Sample 19A	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Beta Hexachlorocyclohexane	Sample 19A	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Delta Hexachlorocyclohexane	Sample 19A	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Lindane (gamma HCH)	Sample 19A	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Trifluralin	Sample 19A	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Alpha Endosulphan	Sample 19A	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Beta Endosulphan	Sample 19A	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Hexachlorobenzene	Sample 19A	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Heptachlor	Sample 19A	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Heptachlor Epoxide	Sample 19A	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)

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Sample Preparation Instructions

Sample 19A – continued

Determinand	Bottle for Analysis	Instruction
Pentachlorobenzene	Sample 19A	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Pendimethalin	Sample 19A	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Cis-chlordane	Sample 7A	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Trans-chlordane	Sample 7A	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Methoxychlor	Sample 7A	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)

Do not correct the results for these dilutions

The matrix is acidified with 0.5% nitric acid to ensure sample stability in transit if necessary it may be neutralised with sodium carbonate after dilution and immediately prior to spiking.



Sample Preparation Instructions

Sample 19B

Materials Supplied

- 1 x 10mL amber glass vial containing spiking solution of chlorinated solvents in methanol
- 1 x 500mL glass bottle containing concentrated effluent water

Preparation

- Dilute the concentrated effluent matrix water with deionised water by a factor of 4 (e.g. 25mL made up to 100mL) before use (deionised water NOT provided)

Determinand	Bottle for Analysis	Instruction
Hexachlorobutadiene	Sample 19B	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Carbon Tetrachloride	Sample 19B	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Tetrachloroethene	Sample 19B	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
1,2,4-Trichlorobenzene	Sample 19B	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Trichloroethene	Sample 19B	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
1,1,1-Trichloroethane	Sample 19B	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
1,3,5-Trichlorobenzene	Sample 19B	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
1,2,3-Trichlorobenzene	Sample 19B	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
1,2-Dichloroethane	Sample 19B	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Chloroform	Sample 19B	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)

Do not correct the results for these dilutions

The matrix is acidified with 0.5% nitric acid to ensure sample stability in transit if necessary it may be neutralised with sodium carbonate after dilution and immediately prior to spiking.



Sample Preparation Instructions

Sample 19C

Materials Supplied

- 2 x 10mL amber glass vial containing spiking solutions of PAHs in methanol
- 1 x 500mL glass bottle containing concentrated effluent water

Preparation

- Dilute the concentrated effluent matrix water with deionised water by a factor of 4 (e.g. 25mL made up to 100mL) before use (deionised water NOT provided)

Determinand	Bottle for analysis	Instruction
Fluoranthene	Sample 19C1	Dilute spiking solution with effluent water by a factor of 100 (e.g. 500µL to 50mL)
Benzo(b)fluoranthene	Sample 19C1	Dilute spiking solution with effluent water by a factor of 100 (e.g. 500µL to 50mL)
Benzo(k)fluoranthene	Sample 19C1	Dilute spiking solution with effluent water by a factor of 100 (e.g. 500µL to 50mL)
Benz(a)pyrene	Sample 19C1	Dilute spiking solution with effluent water by a factor of 100 (e.g. 500µL to 50mL)
Benzo(ghi)perylene	Sample 19C1	Dilute spiking solution with effluent water by a factor of 100 (e.g. 500µL to 50mL)
Indeno(1,2,3-cd)pyrene	Sample 19C1	Dilute spiking solution with effluent water by a factor of 100 (e.g. 500µL to 50mL)
Acenaphthene	Sample 19C2	Dilute spiking solution with effluent water by a factor of 100 (e.g. 500µL to 50mL)
Acenaphthylene	Sample 19C2	Dilute spiking solution with effluent water by a factor of 100 (e.g. 500µL to 50mL)
Anthracene	Sample 19C2	Dilute spiking solution with effluent water by a factor of 100 (e.g. 500µL to 50mL)
Benz(a)anthracene	Sample 19C2	Dilute spiking solution with effluent water by a factor of 100 (e.g. 500µL to 50mL)
Chrysene	Sample 19C2	Dilute spiking solution with effluent water by a factor of 100 (e.g. 500µL to 50mL)
Dibenz(ah)anthracene	Sample 19C2	Dilute spiking solution with effluent water by a factor of 100 (e.g. 500µL to 50mL)
Fluorene	Sample 19C2	Dilute spiking solution with effluent water by a factor of 100 (e.g. 500µL to 50mL)
Naphthalene	Sample 19C2	Dilute spiking solution with effluent water by a factor of 100 (e.g. 500µL to 50mL)
Perylene	Sample 19C2	Dilute spiking solution with effluent water by a factor of 100 (e.g. 500µL to 50mL)
Phenanthrene	Sample 19C2	Dilute spiking solution with effluent water by a factor of 100 (e.g. 500µL to 50mL)
Pyrene	Sample 19C2	Dilute spiking solution with effluent water by a factor of 100 (e.g. 500µL to 50mL)

Do not correct the results for these dilutions

The matrix is acidified with 0.5% nitric acid to ensure sample stability in transit if necessary it may be neutralised with sodium carbonate after dilution and immediately prior to spiking.

N.B. To ensure the full solubility of the analytes in this sample, sub-stock solutions are prepared in hexane as part of the production process. The maximum level of this interferant will be 0.6%



Sample Preparation Instructions

Sample 19D

Materials Supplied

- 1 x 10mL amber glass vial containing spiking solution of polychlorinated biphenyls in methanol
- 1 x 500mL glass bottle containing concentrated effluent water

Preparation

- Dilute the concentrated effluent matrix water with deionised water by a factor of 4 (e.g. 25mL made up to 100mL) before use (deionised water NOT provided)

Determinand	Bottle for Analysis	Instruction
PCB (28)	Sample 19D	Dilute spiking solution with effluent water by a factor of 100 (e.g. 500µL to 50mL)
PCB (52)	Sample 19D	Dilute spiking solution with effluent water by a factor of 100 (e.g. 500µL to 50mL)
PCB (101)	Sample 19D	Dilute spiking solution with effluent water by a factor of 100 (e.g. 500µL to 50mL)
PCB (118)	Sample 19D	Dilute spiking solution with effluent water by a factor of 100 (e.g. 500µL to 50mL)
PCB (138)	Sample 19D	Dilute spiking solution with effluent water by a factor of 100 (e.g. 500µL to 50mL)
PCB (153)	Sample 19D	Dilute spiking solution with effluent water by a factor of 100 (e.g. 500µL to 50mL)
PCB (180)	Sample 19D	Dilute spiking solution with effluent water by a factor of 100 (e.g. 500µL to 50mL)

Do not correct the results for these dilutions

The matrix is acidified with 0.5% nitric acid to ensure sample stability in transit if necessary it may be neutralised with sodium carbonate after dilution and immediately prior to spiking.

N.B. To ensure the full solubility of the analytes in this sample, sub-stock solutions are prepared in hexane as part of the production process. The maximum level of this interferant will be 0.75%



Sample Preparation Instructions

Sample 20

Materials Supplied

- 2 x 10mL amber glass vial containing spiking solution of acid herbicides in methanol
 - Spike 20(1) contains all determinands except glyphosate and AMPA
 - Spike 20(2) contains glyphosate and AMPA
- 1 x 500mL glass bottle containing concentrated effluent water

Preparation

- Dilute the concentrated effluent matrix water with deionised water by a factor of 4 (e.g. 25mL made up to 100mL) before use (deionised water NOT provided)

Determinand	Bottle for Analysis	Instruction
MCPA	Sample 20(1)	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
MCPB	Sample 20(1)	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
2,4-D	Sample 20(1)	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Dichlorprop	Sample 20(1)	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Dicamba	Sample 20(1)	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
2,4-DB	Sample 20(1)	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Bentazone	Sample 20(1)	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Mecoprop	Sample 20(1)	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Propyzamide	Sample 20(1)	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Ioxynil	Sample 20(1)	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Bromoxynil	Sample 20(1)	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Triclopyr	Sample 20(1)	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Clopyralid	Sample 20(1)	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Fluroxypyr	Sample 20(1)	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
2,3,6-TBA	Sample 20(1)	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
2,4,5-T	Sample 20(1)	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Dichlobenil	Sample 20(1)	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Bromacil	Sample 20(1)	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)

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Sample Preparation Instructions

Sample 20 – continued

Determinand	Bottle for Analysis	Instruction
Metazachlor	Sample 20(1)	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Propachlor	Sample 20(1)	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Benazolin	Sample 20(1)	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Metaldehyde	Sample 20(1)	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
2,4,5-TP (Fenoprop)	Sample 20(1)	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Glyphosate	Sample 20(2)	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
AMPA	Sample 20(2)	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)

Do not correct the results for these dilutions

The matrix is acidified with 0.5% nitric acid to ensure sample stability in transit if necessary it may be neutralised with sodium carbonate after dilution and immediately prior to spiking.



Sample Preparation Instructions

Sample 20B

Materials Supplied

- 2 x 10mL amber glass vial containing spiking solution of triazine and urea herbicides in methanol
 - Spike 20B(1) contains analytes isoproturon to metamitron
 - Spike 20B(2) contains analytes simazine to pirimicarb
- 1 x 500mL glass bottle containing concentrated effluent water

Preparation

- Dilute the concentrated effluent matrix water with deionised water by a factor of 4 (e.g. 25mL made up to 100mL) before use (deionised water NOT provided)

Determinand	Bottle for analysis	Instruction
Isoproturon	Sample 20B(1)	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Diuron	Sample 20B(1)	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Linuron	Sample 20B(1)	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Chlortoluron	Sample 20B(1)	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Monuron	Sample 20B(1)	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Methabenzthiazuron	Sample 20B(1)	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Diflufenican	Sample 20B(1)	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Metamitron	Sample 20B(1)	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Simazine	Sample 20B(2)	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Atrazine	Sample 20B(2)	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Propazine	Sample 20B(2)	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Cyanazine	Sample 20B(2)	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Trietazine	Sample 20B(2)	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Prometryn	Sample 20B(2)	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Terbutryn	Sample 20B(2)	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Ametryn	Sample 20B(2)	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Carbetamide	Sample 20B(2)	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Pirimicarb	Sample 20B(2)	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)

Do not correct the results for these dilutions.



Sample Preparation Instructions

Sample 21

Materials Supplied

- 1 x 10mL amber glass vial containing spiking solution of organophosphorus pesticides in methanol
- 1 x 500mL glass bottle containing concentrated effluent water

Preparation

- Dilute the concentrated effluent matrix water with deionised water by a factor of 4 (e.g. 25mL made up to 100mL) before use (deionised water NOT provided)

Determinand	Bottle for Analysis	Instruction
Azinphos-methyl	Sample 21	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Azinphos-ethyl	Sample 21	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Dichlorvos	Sample 21	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Fenitrothion	Sample 21	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Malathion	Sample 21	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Mevinphos	Sample 21	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Chlorfenvinphos	Sample 21	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Diazinon	Sample 21	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Fenthion	Sample 21	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Parathion-ethyl	Sample 21	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Parathion-methyl	Sample 21	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Chlorpyrifos	Sample 21	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Cypermethrin	Sample 21	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)
Propetamphos	Sample 21	Dilute spiking solution with effluent water by a factor of 1,000 (e.g. 500µL to 500mL)

Do not correct the results for these dilutions

The matrix is acidified with 0.5% nitric acid to ensure sample stability in transit if necessary it may be neutralised with sodium carbonate after dilution and immediately prior to spiking.

N.B. Chlorfenvinphos is a mixture of the Z and E isomers. The total concentration of these two isomers should be reported.



Sample Preparation Instructions

Sample 22

Materials Supplied

- 1 x 2mL capillary vial containing a solution of 10 organic compounds at a level of approximately 20mg/L in dichloromethane, labelled 'Sample 22 spike'
- 1 x 2mL capillary vial containing a solvent blank, labelled 'Sample 22 blank'

Preparation

- Analyse the sample as received or dilute, if necessary, to bring into working range of your instrument.
- Identify the 10 unknowns present in the test sample and enter the CAS number (in the format 000000-00-0) and name of the compounds found on the result entry page of the reporting system.

The blank sample has been provided to assist in eliminating adventitious contaminants. The unknowns should be present in the solution only and not be present (or present at only trace levels) in the blank.

The spiking solution can be easily removed from the vials by use of a syringe.

Sample 22A

Materials Supplied

- 1 x 40mL glass vial containing 6 compounds at approximately 50ug/L in deionised water with traces of methanol, labelled 'Sample 22A spike'
- 1 x 40mL glass vial containing deionised water with traces of methanol, labelled 'Sample 22A blank'

Preparation

- Analyse the sample as received or dilute, if necessary, to bring into working range of your instrument.
- Identify the 6 unknowns present in the test sample and enter the CAS number (in the format 000000-00-0) and name of the compounds found on the result entry page of the reporting system.

The blank sample has been provided to assist in eliminating adventitious contaminants. The unknowns should be present in the solution only and not be present (or present at only trace levels) in the blank.



Sample Preparation Instructions

Sample 23

Materials Supplied

1 x glass bottle (variable volume) containing wastewater sample

Preparation

- This sample should be acidified with hydrochloric acid to pH<2 prior to analysis if this is part of your normal procedure for this type of sample

Determinand	Bottle for Analysis	Instruction
Volume of Sample Provided	Sample 23 Oil in Water	This has to be assessed by marking the liquid level or weighing the bottle before any extraction is undertaken
Total Hydrocarbons	Sample 23 Oil in Water	Analyse as supplied

N.B: Oil has been spiked into each bottle so the sample is not homogeneous and sub sampling from the bottle, as with a real sample, is unlikely to give reliable results. Also some oil is likely to be adsorbed to the glass so in situ extraction or washing the container with solvent will be necessary.

The sample volume has to be determined, as it would in a real sample, and results calculated using this volume. Use normal laboratory method to assess the sample volume prior to any extractions.

The oils used are standard Type A and B mineral oils with a carbon number range of C10 to C40. If more information is required, please email aquacheck@lgcpt.com.



Sample Preparation Instructions

Sample 24

Materials Supplied

1 x glass bottle (variable volume) containing wastewater sample

Preparation

- This sample should be acidified with hydrochloric acid to pH<2 prior to analysis if this is part of your normal procedure for this type of sample

Determinand	Bottle for Analysis	Instruction
Volume of Sample Provided	Sample 24 Oil & Grease in Water	This has to be assessed by marking the liquid level or weighing the bottle before any extraction is undertaken
Total Oil and Grease	Sample 24 Oil & Grease in Water	Analyse as supplied

N.B: Oil has been spiked into each bottle so the sample is not homogeneous and sub sampling from the bottle, as with a real sample, is unlikely to give reliable results. Also some oil is likely to be adsorbed to the glass so in situ extraction or washing the container with solvent will be necessary.

The sample volume has to be determined, as it would in a real sample, and results calculated using this volume. Use normal laboratory method to assess the sample volume prior to any extractions.

The oils used are standard Type A and B mineral oils with a carbon number range of C10 to C40, as the oil component, and olive oil as the grease. If more information is required, please email aquacheck@lgcpt.com.

Sample 25

Materials Supplied

1 x 2L glass bottle containing contaminated clean water

Preparation

- Analyse as supplied

Reporting

Participants should seek to identify any contaminants present in the sample which are consistent with the text on the bottle label. If the contaminant is complex, the broad class should be reported. In addition any specific compounds of known toxicological importance should be identified. Participants should also suggest a possible source of contamination.



Sample Preparation Instructions

Sample 26

Materials Supplied

- 1 x 5mL amber glass vial containing spiking solution of PFOS and PFOA in acetone.

N.B: The deionised water required for dilution of this spiking solution is **NOT** supplied

Preparation

Determinand	Bottle for Analysis	Instruction
PFOS	Sample 26	Dilute spiking solution with deionised water by a factor of 10,000 (e.g. 50 μ L to 500mL)
PFOA	Sample 26	Dilute spiking solution with deionised water by a factor of 10,000 (e.g. 50 μ L to 500mL)

Do not correct the results for these dilutions

Sample 27

Materials Supplied

- 1 x 10mL amber glass vial containing spiking solution for analysis of AOX in methanol
- 1 x 500mL glass bottle containing concentrated effluent water

N.B: The deionised water required for dilution of the concentrated effluent water is **NOT** supplied

Preparation

- Dilute the concentrated effluent matrix water with deionised water by a factor of 4 (e.g. 25mL made up to 100mL) before use (deionised water NOT provided)

Determinand	Bottle for Analysis	Instruction
AOX	Sample 27	Dilute spiking solution with effluent water by a factor of 10 (e.g. 1mL to 10mL)

Do not correct the results for these dilutions



Sample Preparation Instructions

Sample 28

Materials Supplied

- 1 x 10ml formaldehyde spiking solution

N.B: The deionised water required for dilution of this spiking solution is **NOT** supplied

Preparation

Determinand	Bottle for analysis	Instruction
Formaldehyde	Sample 28 Formaldehyde	Dilute spiking solution with deionised water by a factor of 10,000 (e.g. 100uL to 1L)

Do not correct the results for these dilutions.

Sample 29

Materials Supplied

- 2 x 250ml bottles containing solutions for analysis of high and low level COD

N.B: The deionised water required for the dilution of the low level spike is **NOT** supplied.

Preparation

Determinand	Bottle for analysis	Instruction
Low Level COD	Sample 29 Low Level COD	Dilute spiking solution by a factor of 10 with deionised water
High Level COD	Sample 29 High Level COD	Analyse as supplied

Do not correct the results for these dilutions.



Sample Preparation Instructions

Sample 30

Materials Supplied

- 1 x 2L plastic bottle containing sample for gross alpha and gross beta activity. This sample has been acidified to give a final nitric acid concentration of 0.5% v/v .

Preparation

Determinand	Bottle for Analysis	Instruction
Gross Alpha as ^{239}Pu	Sample 30 Alpha/Beta	Analyse as supplied
Gross Alpha as ^{241}Am	Sample 30 Alpha/Beta	Analyse as supplied
Gross Alpha as ^{230}Th	Sample 30 Alpha/Beta	Analyse as supplied
Gross Beta as ^{40}K	Sample 30 Alpha/Beta	Analyse as supplied
Gross Beta as ^{137}Cs	Sample 30 Alpha/Beta	Analyse as supplied
Gross Beta as ^{90}Sr	Sample 30 Alpha/Beta	Analyse as supplied

Sample 31

Materials Supplied

- 1 x 250ml glass bottle sample for tritium analysis

Preparation

Determinand	Bottle for Analysis	Instruction
Aqueous Tritium	Sample 31 Tritium	Analyse as supplied

Results should be decay corrected to the date stipulated on the sample label.

Participants may use the nuclear data of their choice. Please note that the National Physical Laboratory (NPL) and the United Kingdom Accreditation Service (UKAS) recommend the following source of nuclear data:

DDEP (the international Decay Data Evaluation Project):
www.nucleide.org/DDEP_WG/DDEPdata.htm



Sample Preparation Instructions

Sample 32

Materials Supplied

- 1 x 125mL HDPE bottle containing sample for total sulfide analysis

Preparation

Determinand	Bottle for Analysis	Instruction
Total sulfide	Sample 32 Sulfide	Shake bottle well then analyse as supplied

Sample 33

Materials Supplied

- 1 x 5ml vial containing algae extract for chlorophyll a determination

Preparation

Determinand	Bottle for Analysis	Instruction
Chlorophyll a	Sample 33 Chlorophyll a	Carefully wash all of the supplied extract out of vial and stopper and make up to 1L with deionised water . Dilute the extract solution with deionised water by a factor of 10 (e.g. 100 mL to 1000 mL) prior to analysis. Please record the sample number (located on the stopper) in the comments section of Portal.

Do not correct the results for these dilutions.



Sample Preparation Instructions

Sample 34

Sample A

Materials Supplied

- One 500ml LDPE bottle containing a solution of metals in 0.5% nitric acid
- One 30ml LDPE bottle containing a spiking solution of mercury in 0.5% nitric acid and 0.05% potassium dichromate.

Preparation

Determinand	Bottle for analysis	Instruction
Cadmium	Sample A Metals	Analyse as supplied
Lead	Sample A Metals	Analyse as supplied
Mercury	Sample A Mercury Spiking Solution	Dilute spiking solution with ' Sample A Metals' water by a factor of 100 (e.g. 1ml made up to 100mls)
Nickel	Sample A Metals	Analyse as supplied

Do not correct the results for these dilutions.

The mercury sample should be treated as any other sample received by your laboratory e.g. addition of more acid or preservatives. Please correct for any changes in concentration produced by the addition of these.

Sample B

Materials Supplied

- One 10ml amber glass vial containing all determinands in a solution of methanol.
- One 2L groundwater matrix

Preparation

Determinand	Bottle for analysis	Instruction
Atrazine	Sample B Spiking Solution	Dilute spiking solution with groundwater supplied by a factor of 10,000 (e.g. 50ul to 500mls)
Diuron	Sample B Spiking Solution	Dilute spiking solution with groundwater supplied by a factor of 10,000 (e.g. 50ul to 500mls)
Isoproturon	Sample B Spiking Solution	Dilute spiking solution with groundwater supplied by a factor of 10,000 (e.g. 50ul to 500mls)
Simazine	Sample B Spiking Solution	Dilute spiking solution with groundwater supplied by a factor of 10,000 (e.g. 50ul to 500mls)

Do not correct the results for these dilutions



Sample Preparation Instructions

Sample C

Materials Supplied

- One 10ml amber glass vial containing all determinands in a solution of methanol.

Preparation

Determinand	Bottle for analysis	Instruction
Alachlor	Sample C Spiking Solution	Dilute spiking solution with deionised water by a factor of 10,000 (e.g. 50ul to 500mls)
Chlorfenvinphos	Sample C Spiking Solution	Dilute spiking solution with deionised water by a factor of 10,000 (e.g. 50ul to 500mls)
Chlorpyrifos	Sample C Spiking Solution	Dilute spiking solution with deionised water by a factor of 10,000 (e.g. 50ul to 500mls)

Do not correct results for these dilutions

Sample D

Material Supplied

- One 10ml amber glass vial containing all determinands in a solution of methanol.

Preparation

Determinand	Bottle for analysis	Instruction
Pentylphenol	Sample D Spiking Solution	Dilute spiking solution with deionised water by a factor of 10,000 (e.g. 50ul to 500mls)
Hexylphenol	Sample D Spiking Solution	Dilute spiking solution with deionised water by a factor of 10,000 (e.g. 50ul to 500mls)
Heptylphenol	Sample D Spiking Solution	Dilute spiking solution with deionised water by a factor of 10,000 (e.g. 50ul to 500mls)
Octylphenol	Sample D Spiking Solution	Dilute spiking solution with deionised water by a factor of 10,000 (e.g. 50ul to 500mls)
Nonylphenol	Sample D Spiking Solution	Dilute spiking solution with deionised water by a factor of 10,000 (e.g. 50ul to 500mls)
Pentachlorophenol	Sample D Spiking Solution	Dilute spiking solution with deionised water by a factor of 10,000 (e.g. 50ul to 500mls)
Bisphenol A	Sample D Spiking	Dilute spiking solution with deionised



Sample Preparation Instructions

	Solution	water by a factor of 10,000 (e.g. 50ul to 500mls)
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Do not correct results for these dilutions

Sample E

Materials Supplied

- One 10ml amber glass vial containing all determinands in a solution of methanol.
- One 2L groundwater matrix

Preparation

Determinand	Bottle for analysis	Instruction
Endosulphan	Sample E Spiking Solution	Dilute spiking solution with groundwater supplied by a factor of 10,000 (e.g. 50ul to 500mls)
Hexachlorobenzene	Sample E Spiking Solution	Dilute spiking solution with groundwater supplied by a factor of 10,000 (e.g. 50ul to 500mls)
Hexachlorocyclohexane	Sample E Spiking Solution	Dilute spiking solution with groundwater supplied by a factor of 10,000 (e.g. 50ul to 500mls)
Pentachlorobenzene	Sample E Spiking Solution	Dilute spiking solution with groundwater supplied by a factor of 10,000 (e.g. 50ul to 500mls)
Trifluralin	Sample E Spiking Solution	Dilute spiking solution with groundwater supplied by a factor of 10,000 (e.g. 50ul to 500mls)
Hexachlorobutadiene	Sample E Spiking Solution	Dilute spiking solution with groundwater supplied by a factor of 10,000 (e.g. 50ul to 500mls)

Do not correct results for these dilutions

Sample F

Materials Supplied



Sample Preparation Instructions

- One 10ml amber glass vial containing all determinands in a solution of methanol.

Preparation

Determinand	Bottle for analysis	Instruction
Benzo(a)pyrene	Sample F Spiking Solution	Dilute spiking solution with deionised water by a factor of 1,000 (e.g. 500ul to 500mls)
Benzo(b)fluoranthene	Sample F Spiking Solution	Dilute spiking solution with deionised water by a factor of 1,000 (e.g. 500ul to 500mls)
Benzo(ghi)perylene	Sample F Spiking Solution	Dilute spiking solution with deionised water by a factor of 1,000 (e.g. 500ul to 500mls)
Benzo(k)fluoranthene	Sample F Spiking Solution	Dilute spiking solution with deionised water by a factor of 1,000 (e.g. 500ul to 500mls)
Indeno(123-cd)pyrene	Sample F Spiking Solution	Dilute spiking solution with deionised water by a factor of 1,000 (e.g. 500ul to 500mls)
Anthracene	Sample F Spiking Solution	Dilute spiking solution with deionised water by a factor of 1,000 (e.g. 500ul to 500mls)
Fluoranthene	Sample F Spiking Solution	Dilute spiking solution with deionised water by a factor of 1,000 (e.g. 500ul to 500mls)

Do not correct results for these dilutions

Sample G

Material Supplied

- One 10ml amber glass vial containing determinand in a solution of methanol.

Preparation

Determinand	Bottle for analysis	Instruction
Tributyltin	Sample G Spiking Solution	Dilute spiking solution with deionised water by a factor of 10,000 (e.g. 50ul to 500mls)

Do not correct results for these dilutions

Sample H

Materials Supplied

- One 10ml amber glass vial containing all determinands in a solution of methanol.



Sample Preparation Instructions

Preparation

Determinand	Bottle for analysis	Instruction
1,2-Dichloroethane	Sample H Spiking Solution	Dilute spiking solution with deionised water by a factor of 1,000 (e.g. 500ul to 500mls)
Dichloromethane	Sample H Spiking Solution	Dilute spiking solution with deionised water by a factor of 1,000 (e.g. 500ul to 500mls)
Trichlorobenzenes	Sample H Spiking Solution	Dilute spiking solution with deionised water by a factor of 1,000 (e.g. 500ul to 500mls)
Trichloromethane	Sample H Spiking Solution	Dilute spiking solution with deionised water by a factor of 1,000 (e.g. 500ul to 500mls)

Do not correct results for these dilutions

SAMPLE I

Material Supplied

- One 10ml amber glass vial containing all determinands in a solution of methanol.

Preparation

Determinand	Bottle for analysis	Instruction
2,4,4 -Tribromodiphenylether (BDE 28)	Sample I Spiking Solution	Dilute spiking solution with deionised water by a factor of 10,000 (e.g. 50ul to 500mls)
2,2,4,4,5 – Pentabromodiphenylether (BDE 99)	Sample I Spiking Solution	Dilute spiking solution with deionised water by a factor of 10,000 (e.g. 50ul to 500mls)
2,2,4,4,5,6-Hexabromodiph enylether (BDE 154)	Sample I Spiking Solution	Dilute spiking solution with deionised water by a factor of 10,000 (e.g. 50ul to 500mls)

Do not correct results for these dilutions

SAMPLE J

Materials Supplied

- Two 10ml amber glass vials containing all determinands in a solution of methanol.
- One 'blank' DEHP sample in methanol.



Sample Preparation Instructions

Preparation

Determinand	Bottle for analysis	Instruction
DEHP	Sample J(1) Spiking Solution	Dilute spiking solution with deionised water by a factor of 1,000 (e.g. 500ul to 500mls)
Benzene	Sample J(2) Spiking Solution	Dilute spiking solution with deionised water by a factor of 1,000 (e.g. 500ul to 500mls)
Naphthalene	Sample J(2) Spiking Solution	Dilute spiking solution with deionised water by a factor of 1,000 (e.g. 500ul to 500mls)

Do not correct results for these dilutions

Sample 50

Materials Supplied

- 1 x 500mL LDPE bottle containing a solution of zinc sulphate

Preparation

- Dilute the sample provided using your usual preparation procedures for the specific test which is to be carried out.
 - The ecotoxicity tests involved are:
 - ♦ *Daphnia Magna* 48hr EC50
 - ♦ *Daphnia Magna* 24hr EC50
 - ♦ *Vibrio Fischeri* 30 minute IC50 (ISO 11348-3)
 - ♦ Other 30 min luminescent bacteria IC50 tests
 - ♦ 15 minute luminescent bacteria IC50 tests
 - ♦ Freshwater algae growth inhibition test (*Pseudokirschneriella subcapitata*)

Reporting

Record the % dilution that you estimate will produce a 50% response in the ecotoxicity test(s) you are using. This result will then be converted to mgZn/L according to the concentration of zinc in the sample.