

## Measurement Assurance and Certification Scotland

### Performance Standard MACS-WAT-01: Sampling and chemical testing of water

#### Addendum B

---

The content of the following tables in performance standard MACS-WAT-01 'Sampling and chemical testing of water' (Version 2, August 2017) is now considered obsolete:

---

- i. Annex A: Performance characteristics. Table A1 - Inorganic determinands (wastewater matrix).
  - ii. Annex A: Performance characteristics. Table A2 - Metal determinands (wastewater matrix).
  - iii. Annex A: Performance characteristics. Table A3 - Organic determinands (wastewater matrix).
- 

Following the issue of 2018 Annual Monitoring Plans on 29 September 2017, each table referenced above is superseded by the versions presented on subsequent pages of this addendum.

**SEPA**  
**October 2017**

**Table A1 – Inorganic determinands (wastewater matrix)**

<b>Determinand</b>	<b>Precision<sup>(1)</sup></b>	<b>%Bias</b>
Ammonia + TON Total (as N) <sup>(2)</sup>	5	10
Ammoniacal Nitrogen (as N)	5	10
Anionic detergents <sup>(3)</sup>	5	10
Biochemical Oxygen Demand - ATU suppressed (BOD) <sup>(4)(5)</sup>	8	10
Chemical Oxygen Demand (COD) <sup>(5)</sup>	5	10
Chloride	5	10
Cyanide	5	10
Cyanide - free	5	10
Electrical Conductivity (25°C)	5	10
Fluoride	5	10
Nitrate (as N)	5	10
Nitrite (as N)	5	10
pH	0.1 <sup>(6)</sup>	0.2 <sup>(6)</sup>
Reactive Phosphorus (as P)	5	10
Suspended Solids (105°C) <sup>(7)</sup>	5	10
Total Nitrogen (as N)	5	10
Total Oxidised Nitrogen (as N)	5	10
Total Phosphorus (as P)	5	10

1. Expressed as %RSD.
2. Test determinand is a calculated result made up of a number of individual determinands. The precision and %bias performance characteristics are for the individual determinands. Each individual parameter must meet the set targets.
3. Also known as MBAS (methylene blue active substances).
4. Standard 5 day analysis, Allylthiourea (ATU) suppressed.
5. Includes filtered BOD and/or filtered COD when stated as a monitoring requirement in the operator's Annual Monitoring Plan. Sample filtered through GF/C (1.2 µm) filter paper before analysis and filtrate analysed as per standard test.
6. Precision and bias for pH expressed in pH units not in percentage terms.
7. Sample filtered through GF/C (1.2 µm) filter paper. Filter dried for 1 hour at 105 °C.

**Table A2 – Metal determinands (wastewater matrix)**

<b>Determinand</b>	<b>Precision<sup>(1)</sup></b>	<b>%Bias</b>
Aluminium	7.5	15
Aluminium - passing 0.45µm membrane <sup>(2)</sup>	7.5	15
Arsenic	7.5	15
Arsenic - passing 0.45µm membrane <sup>(2)</sup>	7.5	15
Cadmium	7.5	15
Cadmium - passing 0.45µm membrane <sup>(2)</sup>	7.5	15
Chromium	7.5	15
Chromium - passing 0.45µm membrane <sup>(2)</sup>	7.5	15
Copper	7.5	15
Copper - passing 0.45µm membrane <sup>(2)</sup>	7.5	15
Iron	7.5	15
Iron - passing 0.45µm membrane <sup>(2)</sup>	7.5	15
Lead	7.5	15
Lead - passing 0.45µm membrane <sup>(2)</sup>	7.5	15
Manganese	7.5	15
Mercury	7.5	15
Mercury - passing 0.45µm membrane <sup>(2)</sup>	7.5	15
Nickel	7.5	15
Nickel - passing 0.45µm membrane <sup>(2)</sup>	7.5	15
Zinc	7.5	15
Zinc - passing 0.45µm membrane <sup>(2)</sup>	7.5	15

1. Expressed as %RSD.
2. Sample filtered through 0.45 µm membrane filter (or equivalent) and filtrate analysed by standard method.

**Table A3 – Organic determinands (wastewater matrix)**

<b>Determinand</b>	<b>Precision<sup>(1)</sup></b>	<b>%Bias</b>
Chlorfenvinphos	12.5	25
Chloroform	12.5	25
cis-Permethrin	12.5	25
Cyfluthrin	12.5	25
Diazinon	12.5	25
Dichloromethane	12.5	25
gamma - HCH <sup>(2)</sup>	12.5	25
Pentachlorophenol	12.5	25
Permethrin - All Isomers Total <sup>(3)(4)</sup>	12.5	25
Propetamphos	12.5	25
Total Nonionic Detergents <sup>(3)(5)</sup>	12.5	25
Total Petroleum Hydrocarbons	12.5	25
trans-Permethrin	12.5	25

1. Expressed as %RSD.
2. gamma-hexachlorocyclohexane (Lindane).
3. Test determinand is a calculated result made up of a number of individual constituent determinands. The precision and % bias performance characteristics are for the individual determinands. Each individual determinand must meet the set targets.
4. Required constituent determinands: cis-Permethrin and trans-Permethrin.
5. Required constituent determinands: 4-Nonylphenol monoethoxylate, 4-Nonylphenol diethoxylate, 4-Nonylphenol triethoxylate, p-tert-octylphenol monoethoxylate and p-tert-octylphenol diethoxylate.