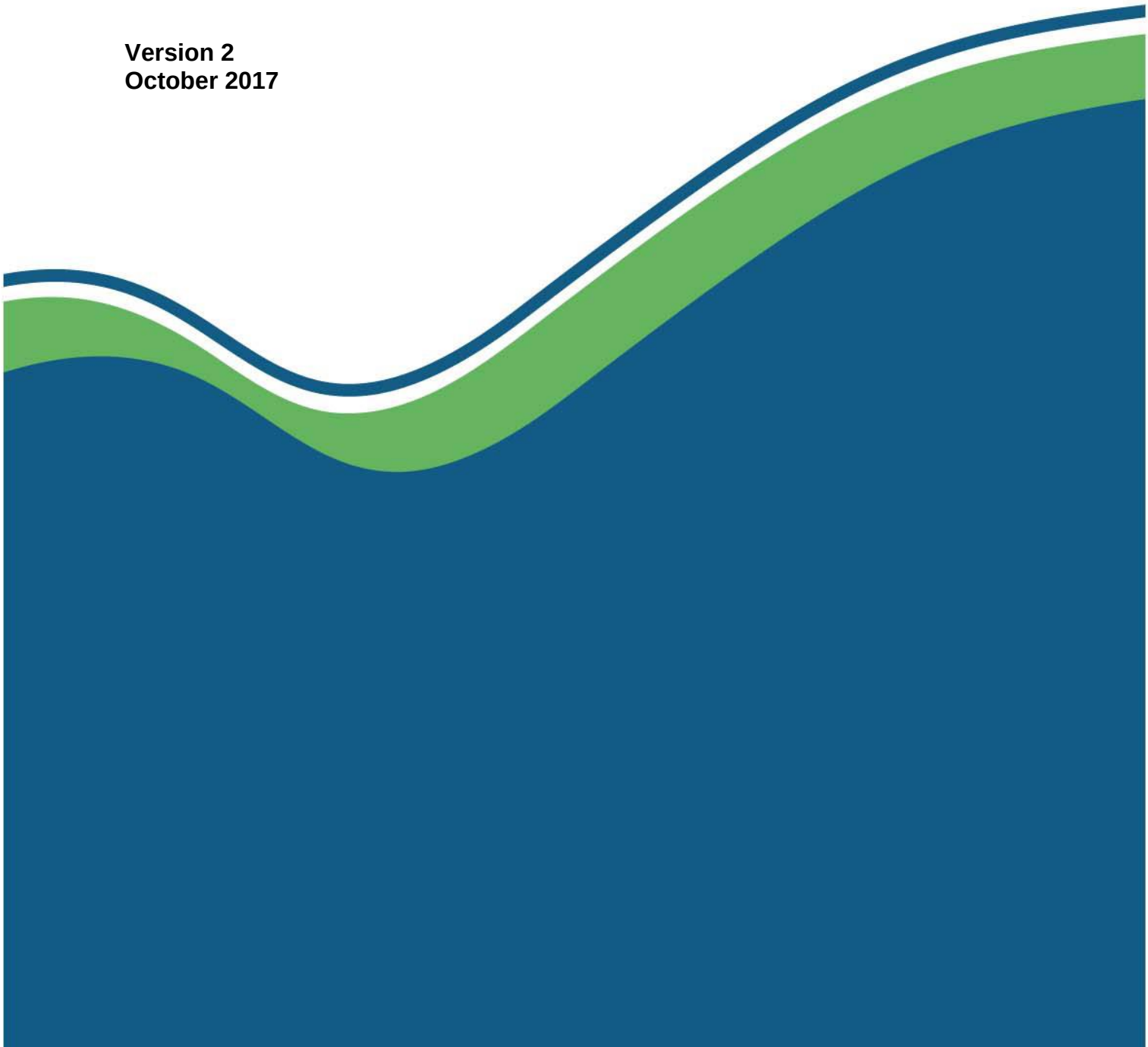
SEPA
Scottish Environment Protection Agency
Buidheann Dion Àrainneachd na h-Alba

Measurement Assurance and Certification Scotland

Operator specific criteria - Scottish Water
MACS-OP-01

Version 2
October 2017



Introduction

As Scotland's principal environmental regulator, the Scottish Environment Protection Agency (SEPA) is responsible for protecting and improving Scotland's environment.

SEPA issues a range of authorisations designed to control operator activities which could lead to pollution or environmental damage. Compliance with these authorisations is important to ensure that the environment is protected. An operator's compliance is assessed by SEPA from information gathered from observations, sampling and analysis. These activities may be carried out by an operator under self-monitoring arrangements.

SEPA has established Measurement Assurance and Certification Scotland (MACS) to provide a range of performance standards which ensure data provided by self-monitoring operators is robust, and provides stakeholders with confidence that data is reliable.

Where an operator complies with the requirements of MACS, they will be deemed competent to supply self-monitoring data to SEPA.

SEPA requires all operators and associated organisations certified under MACS to be accredited by the United Kingdom Accreditation Service (UKAS) to ISO/IEC 17025.

Please direct questions regarding the MACS certification process to UKAS at:

United Kingdom Accreditation Service
2 Pine Trees
Chertsey Lane
Staines-upon-Thames
TW18 3HR

Tel: 01784 429 000

Email: info@ukas.com
Website: www.ukas.com

A Performance characteristics

Specific minimum performance characteristics applicable to the MACS certified analyses required of **Scottish Water** are detailed in Tables A1, A2 and A3 below. These lists must be used in conjunction with the generic method performance characteristics documented in Annex A of performance standard MACS-WAT-01.

Table A1 – Inorganic determinands (wastewater matrix)

Determinand	**Units**(1)	**MDL**(2)
Ammonia + TON Total (as N)(3)	mg/L as N	5
Ammoniacal Nitrogen (as N)	mg/L as N	0.025
Biochemical Oxygen Demand - ATU suppressed (BOD)(4)(5)	mg/L as O_2	2
Chemical Oxygen Demand (COD)(5)	mg/L as O_2	15
Chloride	mg/L	10
Cyanide	µg/L as CN	6
Cyanide - free	µg/L as CN	6
Fluoride	mg/L	1.5
pH	pH units	N/A
Reactive Phosphorus (as P)	mg/L as P	0.01
Suspended Solids (105°C)(6)	mg/L	2
Total Nitrogen (as N)	mg/L as N	0.25
Total Oxidised Nitrogen (as N)	mg/L as N	0.2
Total Phosphorus (as P)	mg/L as P	0.05

1. Units displayed are not necessarily the units that operators will be required to use when reporting self-monitoring data to SEPA. Units required for reporting purposes will be defined by SEPA in an operator's Annual Monitoring Plan.
2. For further detail on Method Detection Limit (MDL) consult MACS-WAT-01, Annex C.
3. Test determinand is a calculated result made up of a number of individual constituent determinands.
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. Sample filtered through GF/C (1.2 µm) filter paper. Filter dried for 1 hour at 105 °C.

Table A2 – Metal determinands (wastewater matrix)

Determinand[1]	**Units**[2]	**MDL**[3]
Aluminium - passing 0.45µm membrane[4]	µg/L	25
Cadmium	µg/L	0.1
Cadmium - passing 0.45µm membrane[4]	µg/L	0.1
Chromium	µg/L	0.3
Chromium - passing 0.45µm membrane[4]	µg/L	0.3
Copper	µg/L	1.5
Copper - passing 0.45µm membrane[4]	µg/L	1.5
Iron	mg/L	0.1
Lead	µg/L	0.3
Lead - passing 0.45µm membrane[4]	µg/L	0.3
Mercury	µg/L	0.02
Nickel	µg/L	0.5
Nickel - passing 0.45µm membrane[4]	µg/L	0.5
Zinc	µg/L	1.6
Zinc - passing 0.45µm membrane[4]	µg/L	1.6

1. Determination of total metal determinand is required, unless otherwise stated.
2. Units displayed are not necessarily the units that operators will be required to use when reporting self-monitoring data to SEPA. Units required for reporting purposes will be defined by SEPA in an operator's Annual Monitoring Plan.
3. For further detail on Method Detection Limit (MDL) consult MACS-WAT-01, Annex C.
4. Sample filtered through 0.45 µm membrane filter (or equivalent) and filtrate analysed by standard method.

Table A3 – Organic determinands (wastewater matrix)

Determinand	**Units**[1]	**MDL**[2]
Chlorfenvinphos	ng/L	200
Chloroform	µg/L	1
Cyfluthrin	ng/L	5
Diazinon	ng/L	20
Dichloromethane	µg/L	2
gamma - HCH[3]	ng/L	1.5
Permethrin - All Isomers Total[4][5]	ng/L	8
Propetamphos	ng/L	60
Total Nonionic Detergents[4][6]	µg/L	250

1. Units displayed are not necessarily the units that operators will be required to use when reporting self-monitoring data to SEPA. Units required for reporting purposes will be defined by SEPA in an operator's Annual Monitoring Plan.
2. For further detail on Method Detection Limit (MDL) consult MACS-WAT-01, Annex C.
3. gamma-hexachlorocyclohexane (Lindane).
4. Test determinand is a calculated result made up of a number of individual constituent determinands.
5. Required constituent determinands: cis-Permethrin and trans-Permethrin.
6. Required constituent determinands: 4-Nonylphenol monoethoxylate, 4-Nonylphenol diethoxylate, 4-Nonylphenol triethoxylate, p-tert-octylphenol monoethoxylate and p-tert-octylphenol diethoxylate.

B Reporting requirements

B.1 Data transfer

The preferred mechanism for the transfer of data to SEPA from Scottish Water is via a synchronous web service. However, until this is fully developed and implemented the following interim solution has been put in place:

- An Excel spreadsheet containing all data intended for submission will be constructed and emailed to operator.data@sepa.org.uk.
- As a minimum, the subject line of each submission email **must** contain at least the following standard text: OSM.
- File names will be defined by the operator; however each individual data file **must** be uniquely named.
- Frequency of data transfer is at the operator's discretion, but **must** adhere with the requirements of MACS-WAT-02.
- Submission of individual data item(s) to SEPA systems may only be performed once, unless the operator is specifically instructed otherwise by SEPA.

B.2 Data specification

B.2.1 Core dataset

All operator data submissions **must** reference each of the 13 attributes listed in the detailed core dataset specification in Table B1 below.

Automated data submission error notifications will be generated by SEPA systems to alert the operator that remedial action and/or resubmission is required when:

- A value for an attribute identified as a mandatory requirement in Table B1 is missing from a data submission.
- The value supplied for an attribute is not a valid value for that attribute.
- The formatting/data type of a submitted value is incorrect.
- A delay reason has not been provided when one is expected, e.g. when the sampled date does not match the scheduled sampling date.
- Data item(s) are submitted which are not expected by SEPA.
- Data item(s) submitted by an operator have previously been submitted and accepted into SEPA systems.

B.2.2 **Non-analytical determinands**

In addition to the analytical determinands listed in Tables A1, A2 and A3 above, an operator's annual monitoring plan (AMP) may include requirements for some or all of the following non-analytical (or observational) determinands:

- Field comments.
- Overflow operating.
- Weather.

NOTE 1: 'Field comments' are optional data return items and will not be listed on an operator's AMP.

The observation of any non-analytical determinand required of an operator at a monitoring site is expected to be performed at the same time as any scheduled sampling event for the analytical determinand(s) required at that monitoring site.

NOTE 2: 'Overflow operating' observations at a monitoring site are identified on an operator's AMP by their own unique location code; and must be reported against that location code.

Specification of the value(s) required to be submitted by an operator when returning data for each non-analytical determinand listed above is detailed in Table B2 below.

Table B1 – Core dataset specification: Excel submissions

Attribute	Column header	Value	Value: mandatory?	Value: formatting	Notes
Operator name	<operator>	SCOT_WATER	Y	General	Standard value issued by SEPA. Verifies the source of a data submission.
Location code	<locCode>	e.g. 6999	Y	General	In returning data to SEPA the operator must use the 'LOCATION' code identified in their AMP.
Scheduled sampling date	<schedDate>	e.g. 02/05/16	N	Text	Where the sample is an additional sample and hence does not have an agreed scheduled date, then a value of N/A must be submitted.
Sampled date/time	<sampDateTime>	e.g. 04/08/16 11:08	Y	Text	
Determinand	<determinand>	e.g. Biochemical Oxygen Demand - ATU suppressed	Y	General	In returning data to SEPA the operator must use the 'DETERMINAND' names identified in their AMP. For further detail on submission of non-analytical determinands see Table B2.
Qualifier	<qualifier>	< or >	N	General	If NULL, use N/A.
Value	<value>	e.g. 45.6	N	Text	If the result has been cancelled, then a value of N/A must be submitted.
Unit	<unit>	e.g. MGL	Y	General	In returning data to SEPA the operator must use the 'UNIT' names identified in their AMP.
Accredited	<accred>	T or F	Y	General	'T' = ISO/IEC 17025 accredited result. 'F' = unaccredited result.
Subcontracted	<subcontracted>	T or F	Y	General	'T' = subcontracted result. 'F' = in-house result.

Attribute	Column header	Value		Value: mandatory?	Value: formatting	Notes
Non-conformance reason code	<ncReason>	**Value**	**Associated reason**	N	Number	If NULL, use N/A. Where provided, the submission must use the '***Value***' listed against the appropriate '***Associated reason***'.
		1	Sample bottle incorrect			
		2	Sample bottle incorrectly filled			
		4	Sample bottle damaged in transit (to lab)			
		5	Sample contaminated			
		6	Sample bottle damaged in transit (between labs)			
		7	Sample bottle stored incorrectly			
		8	Sample preservation incorrect			
		9	Sample deterioration			
		10	Sample bottle delivery time target exceeded			
		11	Determinand analytical time target exceeded at receipt			
		12	Determinand preparation time target exceeded at receipt			
		13	Sample prep. delayed beyond determinand preparation time target			
		14	Sample analysis delayed beyond determinand analytical time target			
		15	Sample bottle damaged within analysing laboratory			
		16	Sampler not accredited			

Attribute	Column header	Value		Value: mandatory?	Value: formatting	Notes
		17	Result associated with QC failure			
		18	Other MACS AQC requirement not met			
Sampling delay reason code	<delayReason>	**Value**	**Associated reason**	N	Text	If NULL, use N/A. If '***Scheduled sampling date***' ≠ '***Sampled date***' (with time removed) then a delay reason is expected. Where provided, the submission must use the '***Value***' listed against the appropriate '***Associated reason***'. The requirement to supply a delay reason is also applicable to samples collected prior to the agreed scheduled date. Data submitted from additional samples must not be supplied with a delay reason applied.
		A	No discharge			
		B	No access available			
		C	Bottle broken prior to receipt in lab			
		D	Autosampler issue			
		E	Vehicle breakdown			
		F	Unexpected staff absence			
		G	Adverse weather			
		H	Autosampler empty			
		I	Other reason (recorded in field comments)			
Operator reference	<operatorRef>	e.g. 334990499		Y	Text	Value defined by the operator; to be used by all parties to facilitate discussion when required e.g. where a submission is associated with a concession request, or has issues/errors. It is suggested that this should be either the unique identifier of the result or of the sample.

Table B2 – Non-analytical determinands: value specification

<table>
<tr><th>Determinand</th><th colspan="2">Value</th><th>Notes</th></tr>
<tr><td>Field comments</td><td colspan="2">e.g. Sample coloured red</td><td>Free text field to max. 254 characters.

Only to be provided when a comment has been recorded by the sampler.</td></tr>
<tr><td>Overflow operating</td><td colspan="2">T or F</td><td>‘T’ = overflow is operating.
‘F’ = overflow not operating.

Where no overflow observation is carried out, the protocol detailed in Table B1 for supplying a cancelled ‘Value’ must be followed.</td></tr>
<tr><td rowspan="13">Weather</td><td>Value</td><td>Description</td><td rowspan="13">Submissions must use the ‘Value’ listed against the appropriate ‘Description’.

Where no weather observation is carried out, the protocol detailed in Table B1 for supplying a cancelled ‘Value’ must be followed.</td></tr>
<tr><td>1</td><td>Sunny and hot</td></tr>
<tr><td>2</td><td>Sunny and warm</td></tr>
<tr><td>3</td><td>Sunny and cold</td></tr>
<tr><td>4</td><td>Overcast and warm</td></tr>
<tr><td>5</td><td>Overcast and cold</td></tr>
<tr><td>6</td><td>Sunny intervals</td></tr>
<tr><td>7</td><td>Fog / mist / haar</td></tr>
<tr><td>8</td><td>Light rain</td></tr>
<tr><td>9</td><td>Showers</td></tr>
<tr><td>10</td><td>Heavy rain</td></tr>
<tr><td>11</td><td>Stormy</td></tr>
<tr><td>12</td><td>Snow or sleet</td></tr>
</table>