

[^{F1}SCHEDULE 3 **S**

Regulation 14A(1) and (2)

METHODS OF ANALYSIS

Textual Amendments

- F1** Sch. 3 substituted (27.10.2017) by [The Public Water Supplies \(Scotland\) Amendment Regulations 2017 \(S.S.I. 2017/281\)](#), reg. 1(1), **sch. 2** (as amended by [The Public and Private Water Supplies \(Miscellaneous Amendments\) \(Scotland\) Regulations 2017 \(S.S.I. 2017/321\)](#), regs. 1, **3(3)(a)(b)**)

1.—(1) Scottish Water must ensure that the methods of analysis used for the purposes of monitoring and demonstrating compliance with these Regulations are validated and documented in accordance with European standard EN ISO/IEC 17025:2005 entitled “*General requirements for the competence of testing and calibration laboratories (ISO/IEC 17025:2005)*”, or other equivalent standards accepted at international level.

(2) Scottish Water must ensure that laboratories or parties contracted by laboratories apply quality management system practices in accordance with European standard EN ISO/IEC 17025:2005 entitled “*General requirements for the competence of testing and calibration laboratories (ISO/IEC 17025:2005)*”, or other equivalent standards accepted at international level.

[^{F2}(3) For the purposes of assessing the equivalence of alternative methods with methods specified in this schedule, Scottish Water may use European standard EN ISO 17994:2014 entitled “*Water quality - Requirements for the comparison of the relative recovery of microorganisms by two quantitative methods*”, or European standard EN ISO 16140:2003 entitled “*Microbiology of food and animal feeding stuffs - Protocol for the validation of alternative methods*”, or any other similar internationally accepted protocols, to establish the equivalence of methods based on principles, other than culturing, which are beyond the scope of European Standard EN ISO 17994:2014.]

Textual Amendments

- F2** Sch. 3 para. 1(3) inserted (1.1.2023) by [The Public Water Supplies \(Scotland\) Amendment Regulations 2022 \(S.S.I. 2022/387\)](#), reg. 1(1), **18(2)**

2. In the absence of an analytical method meeting the minimum performance criteria set out in Part B of this schedule, Scottish Water must ensure that monitoring is carried out using best available techniques not entailing excessive costs.

PART A **S**

Microbiological parameters

1.—(1) Subject to sub-paragraph (2), the methods in paragraph 2 are given for reference.

(2) Scottish Water may use other methods, providing the provisions of regulation 14A are met.

2. The methods for microbiological parameters are—

(a) for *Escherichia coli* and coliform bacteria—

- (i) European standard EN ISO 9308-1:2014 entitled “*Water quality - Enumeration of Escherichia coli and coliform bacteria - Part 1: Membrane filtration method for waters with low bacterial background flora (ISO 9308-1:2014)*”; or

Changes to legislation: There are currently no known outstanding effects for the The Public Water Supplies (Scotland) Regulations 2014, SCHEDULE 3. (See end of Document for details)

- (ii) European standard EN ISO 9308-2:2014 entitled “*Water quality - Enumeration of Escherichia coli and coliform bacteria - Part 2: Most probable number method (ISO 9308-2:2012)*”;
- (b) for enterococci, European standard EN ISO 7899-2:2000 entitled “*Water quality - Detection and enumeration of intestinal enterococci - Part 2: Membrane filtration method (ISO 7899-2:2000)*”;
- ^{F3}(c)
- (d) for colony count 22 °C (the enumeration of culturable microorganisms — colony count after aerobic incubation at 22 °C), European standard EN ISO 6222:1999 entitled “*Water quality - Enumeration of culturable micro-organisms - Colony count by inoculation in a nutrient agar culture medium (ISO 6222:1999)*”;
- ^{F4}(e)
- (f) for *Clostridium perfringens* including spores, European standard EN ISO 14189:2016 entitled “*Water quality - Enumeration of Clostridium perfringens - Method using membrane filtration (ISO 14189:2013)*”
- ^{F5}(g) for *somatic coliphages*, European Standard EN ISO 10705-2:2000 entitled “*Water quality — Detection and enumeration of bacteriophages — Part 2: Enumeration of somatic coliphages*” and European Standard EN ISO 10705-3:2003 entitled “*Water quality — Detection and enumeration of bacteriophages — Part 3: Validation of methods for concentration of bacteriophages from water*” can be used].

Textual Amendments	
F3	Sch. 3 Pt. A para. 2(c) omitted (1.1.2023) by virtue of The Public Water Supplies (Scotland) Amendment Regulations 2022 (S.S.I. 2022/387), regs. 1(1), 18(3)(a)
F4	Sch. 3 Pt. A para. 2(e) omitted (1.1.2023) by virtue of The Public Water Supplies (Scotland) Amendment Regulations 2022 (S.S.I. 2022/387), regs. 1(1), 18(3)(a)
F5	Sch. 3 Pt. A para. 2(g) inserted (1.1.2023) by The Public Water Supplies (Scotland) Amendment Regulations 2022 (S.S.I. 2022/387), regs. 1(1), 18(3)(b)

PART B S

Chemical and indicator parameters

1.—(1) [^{F6}For] a parameter in Table 1, the method of analysis used must, as a minimum, be capable of measuring concentrations equal to the prescribed concentration or value for the parameter with—

- (a) a limit of quantification of 30 % or less of the prescribed concentration or value for the parameter; and
- (b) an uncertainty of measurement as specified in Table 1 for the parameter.

(2) The result of the analysis for a parameter in Table B or Table C must be expressed using at least the same number of significant figures as the prescribed concentration or value for the parameter in the table.

Textual Amendments

F6 Word in sch. 3 Pt. B para. 1(1) substituted (1.1.2023) by The Public Water Supplies (Scotland) Amendment Regulations 2022 (S.S.I. 2022/387), regs. 1(1), **18(4)(a)**

2. The uncertainty of measurement specified in Table 1 for a parameter must not be used as an additional tolerance to the prescribed concentration or value for the parameter.

F73.

[F8] Minimum performance characteristic: uncertainty of measurement

<i>Parameter</i>	<i>Uncertainty of measurement (% of prescribed concentration or value, except pH) (Note 1)</i>	<i>Notes</i>
Aluminium	25	
Ammonium	40	
Acrylamide	30	
Antimony	40	
Arsenic	30	
Benzo(a)pyrene	50	Note 2
Benzene	40	
Bisphenol A	50	
Boron	25	
Bromate	40	
Cadmium	25	
Chloride	15	
Chlorate	40	
Chlorite	40	
Chromium	30	
Conductivity	20	
Copper	25	
Cyanide	30	Note 3
1,2-dichloroethane	40	
Epichlorohydrin	30	
Fluoride	20	
HAAs	50	
Hydrogen ion concentration (in pH)	0.20	Note 4

Changes to legislation: There are currently no known outstanding effects for the The Public Water Supplies (Scotland) Regulations 2014, SCHEDULE 3. (See end of Document for details)

Parameter	Uncertainty of measurement (% of prescribed concentration or value, except pH) (Note 1)	Notes
Iron	30	
Lead	30	
Manganese	30	
Mercury	30	
Microcystin-LR	30	
Nickel	25	
Nitrate	15	
Nitrite	20	
Oxidisability	50	Note 5
Pesticides	30	Note 6
PFAS	50	
Polycyclic aromatic hydrocarbons	40	Note 7
Selenium	40	
Sodium	15	
Sulphate	15	
Tetrachloroethene	40	Note 8
Trichloroethene	40	Note 8
Trihalomethanes – total	40	Note 7
Total organic carbon	30	Note 9
Turbidity	30	Note 10
Uranium	30	
Vinyl chloride	50	

Notes—

Note 1: Uncertainty of measurement is a non-negative parameter characterising the dispersion of the quantity values being attributed to a measurand, based on the information used. The performance criterion for measurement uncertainty ($k = 2$) is the percentage of the parametric value stated in the table or any stricter value. The uncertainty of measurement must be estimated at the level of the parametric value, unless otherwise specified.

Note 2: If the value of uncertainty of measurement cannot be met, the best available technique must be selected (up to 60%).

Note 3: The method determines total cyanide in all forms.

Note 4: The value for the uncertainty of measurement is expressed in pH units.

Note 5: Reference method European standard EN ISO 8467:1995 entitled “*Water quality - Determination of permanganate index (ISO 8467:1993)*”.

Note 6: The performance characteristics for individual pesticides are given as an indication. Values for the uncertainty of measurement as low as 30 % can be achieved for several pesticides, higher values up to 80% may be allowed for a number of pesticides.

Note 7: The performance characteristics apply to individual substances, specified at 25% of the prescribed concentration or value for the corresponding parameter in Table B.

Changes to legislation: There are currently no known outstanding effects for the The Public Water Supplies (Scotland) Regulations 2014, SCHEDULE 3. (See end of Document for details)

Note 8: The performance characteristics apply to individual substances, specified at 50% of the prescribed concentration or value for the corresponding parameter in Table B.

Note 9: The uncertainty of measurement must be estimated at the level of 3 mg/l of the total organic carbon in accordance with European standard EN 1484:1997 entitled “Water analysis - Guidelines for the determination of total organic carbon and dissolved organic carbon”.

Note 10: The uncertainty of measurement must be estimated at the level of 1.0 nephelometric turbidity units in accordance with European standard EN ISO 7027-1:2016 entitled “Water quality - Determination of turbidity - Part 1: Quantitative methods (ISO 7027-1:2016)” or another equivalent standard method.]

Textual Amendments

- F7** Sch. 3 Pt. B para. 3 omitted (1.1.2023) by virtue of The Public Water Supplies (Scotland) Amendment Regulations 2022 (S.S.I. 2022/387), regs. 1(1), **18(4)(b)**
- F8** Sch. 3 Pt. B Table and notes substituted for sch. 3 Pt. B Table 1, 2 and notes (1.1.2023) by The Public Water Supplies (Scotland) Amendment Regulations 2022 (S.S.I. 2022/387), reg. 1(1), **sch. 3**

PART C S

Indicative dose

For each parameter in Table 3, the method of analysis used must be capable of measuring activity concentrations with at least the limit of detection specified for that parameter in the second column of the table.

TABLE 3

Minimum performance characteristics: limit of detection

Parameter	Limit of detection (in Bq/l) (Notes 1 and 2)	Notes
Tritium	10	Note 3
Radon	10	Note 3
gross alpha activity	0.04	Note 4
gross beta activity	0.4	Note 4
U-238	0.02	
U-234	0.02	
Ra-226	0.04	
Ra-228	0.02	Note 5
Pb-210	0.02	
Po-210	0.01	
C-14	20	
Sr-90	0.4	
Pu-239 / Pu-240	0.04	
Am-241	0.06	

Changes to legislation: There are currently no known outstanding effects for the The Public Water Supplies (Scotland) Regulations 2014, SCHEDULE 3. (See end of Document for details)

Co-60	0.5	
Cs-134	0.5	
Cs-137	0.5	
I-131	0.5	

Notes to Table 3

Note 1: The limit of detection must be calculated in accordance with the international standard ISO 11929:2010 entitled “Determination of the characteristic limits (decision threshold, detection limit and limits of the confidence interval) for measurements of ionising radiation - Fundamentals and application”, with probabilities of errors of 1st and 2nd kind of 0.05 each.

Note 2: Measurement uncertainties must be calculated and reported as complete standard uncertainties, or as expanded standard uncertainties with an expansion factor of 1.96, in accordance with international standard ISO/IEC Guide 98-3:2008 entitled “Guide to the expression of uncertainty in measurement”.

Note 3: The limit of detection for tritium and for radon is 10% of the corresponding prescribed concentration or value for the parameter.

Note 4: The limit of detection for gross alpha activity and gross beta activities is 40% of the screening values of 0.1 Bq/l and 1.0 Bq/l respectively.

Note 5: This limit of detection applies only to initial screening for indicative dose for a new water source. If initial checking indicates that it is unlikely that Ra-228 exceeds 20% of the derived concentration, the limit of detection may be increased to 0.08 Bq/l for routine Ra-228 nuclide specific measurements, until a subsequent re-check is required.]

Changes to legislation:

There are currently no known outstanding effects for the The Public Water Supplies (Scotland) Regulations 2014, SCHEDULE 3.