

SCHEDULE 3

Regulation 12

Sampling and analysis

PART 1

General

[^{F1} Samples: general

1.—(1) A local authority must secure, so far as reasonably practicable, that when it takes, handles, transports, stores or analyses any sample required to be taken for the purposes of this Schedule, or causes any such sample to be taken, handled, transported, stored or analysed, it complies with the appropriate requirements.

(2) A local authority must secure that a person accredited by the United Kingdom Accreditation Service checks from time to time the local authority's compliance with the appropriate requirements.

(3) Additionally, when undertaking activity described in sub-paragraph (1) the local authority must demonstrate compliance with the following standards—

(a) as regards any such activity, other than analysing samples, on or after 11th July 2020, European standard EN ISO/IEC 17024 entitled “*Conformity Assessment. General requirements for bodies operating certification of persons*”, European standard EN ISO/IEC 17025 entitled “*General requirements for the competence of testing and calibration laboratories*” or other equivalent standards accepted at international level;

(b) as regards the activity of analysing samples, European standard EN ISO/IEC 17025 or another equivalent standard accepted at international level.

(4) In this paragraph, “appropriate requirements” means such of the following as are applicable—

(a) the sample is representative of the quality of the water at the time of sampling;

(b) the person taking the sample is doing so in accordance with a system of quality control to an appropriate standard;

(c) the sample is not contaminated in the course of being taken;

(d) the sample is kept at such a temperature and in such conditions as will secure that there is no material alteration of the concentration or value for the measurement or observation of which the sample is intended;

(e) the sample is analysed whether at the time and place it is taken or as soon as reasonably practicable after it is taken—

(i) by or under the supervision of a person who is competent to perform that task, and

(i) with the use of such equipment as is suitable for the purpose.]

F1 Sch. 3 Pt. 1 para. 1 substituted (11.7.2018) by [The Private Water Supplies \(England\) \(Amendment\) Regulations 2018 \(S.I. 2018/707\)](#), regs. 1(1), **2(11)(a)** (with reg. 3)

Analysing samples

2.—(1) A local authority must ensure that each sample is analysed in accordance with this paragraph.

(2) For each parameter specified in the first column of Table 1 in Part 2 of this Schedule, the method of analysis is specified in the second column of that Table.

^{F2}(3)

^{F3}(4)

(5) The method of analysis used for odour and taste parameters must be capable of measuring values equal to the parametric value with a precision [^{F4}or uncertainty of measurement] of 1 dilution number at 25°C.

[^{F5}(6) For the parameters set out in Table 3 in Part 2 of this Schedule, the specified performance characteristics are that the method of analysis used must be capable of measuring concentrations equal to the parametric value with a limit of quantification, as defined in Article 2(2) of Commission Directive 2009/90/EC laying down technical specifications for chemical analysis and monitoring of water status, of 30% or less of the relevant parametric value and an uncertainty of measurement as specified in that Table.

(7) The result must be expressed using at least the same number of significant figures as for the parametric value quoted and in the same units laid down in these Regulations.

(8) The uncertainty of measurement laid down in Table 3 in Part 2 of this Schedule must not be used as an additional tolerance to the parametric values set out in Schedule 1.]

F2	Sch. 3 Pt. 1 para. 2(3) omitted (11.7.2018) by virtue of The Private Water Supplies (England) (Amendment) Regulations 2018 (S.I. 2018/707) , regs. 1(1), 2(11)(b)(i) (with reg. 3)
F3	Sch. 3 Pt. 1 para. 2(4) omitted (11.7.2018) by virtue of The Private Water Supplies (England) (Amendment) Regulations 2018 (S.I. 2018/707) , regs. 1(1), 2(11)(b)(i) (with reg. 3)
F4	Words in Sch. 3 Pt. 1 para. 2(5) inserted (11.7.2018) by The Private Water Supplies (England) (Amendment) Regulations 2018 (S.I. 2018/707) , regs. 1(1), 2(11)(b)(ii) (with reg. 3)
F5	Sch. 3 Pt. 1 para. 2(6)-(8) substituted for Sch. 3 Pt. 1 para. 2(6) (11.7.2018) by The Private Water Supplies (England) (Amendment) Regulations 2018 (S.I. 2018/707) , regs. 1(1), 2(11)(b)(iii) (with reg. 3)

Authorisation of alternative methods of analysis

3.—(1) The Secretary of State may authorise a method different from that set out in paragraph 2(2) if satisfied that it is at least as reliable.

(2) An authorisation may be time-limited and may be revoked at any time.

Sampling and analysis by persons other than local authorities

4.—(1) A local authority may enter into an arrangement for any person to take and analyse samples on its behalf.

(2) A local authority must not enter into an arrangement under sub-paragraph (1) unless—

- (a) it is satisfied that the task will be carried out promptly by a person competent to perform it, and
- (b) it has made arrangements that ensure that any breach of these Regulations is communicated to it immediately, and any other result is communicated to it within 28 days.

PART 2

Analytical methods

Table 1

Prescribed methods of analysis

<i>Parameter</i>	<i>Method</i>
Clostridium perfringens (including spores)	[^{F6} BS-EN ISO 14189]
Coliform bacteria and [^{F7} <i>E. coli</i>]	BS-EN ISO 9308-1 and BS-EN ISO 9308-2
Colony count 22°C-enumeration of culturable microorganisms	BS-EN ISO 6222
Colony count 37°C-enumeration of culturable microorganisms	BS-EN ISO 6222
Enterococci	BS-EN ISO 7899-2
<i>Pseudomonas aeruginosa</i>	[^{F8} BS-EN ISO 16266]

F6	Words in Sch. 3 Pt. 2 substituted (11.7.2018) by The Private Water Supplies (England) (Amendment) Regulations 2018 (S.I. 2018/707) , regs. 1(1), 2(11)(c)(i) (with reg. 3)
F7	Words in Sch. 3 Pt. 2 substituted (11.7.2018) by The Private Water Supplies (England) (Amendment) Regulations 2018 (S.I. 2018/707) , regs. 1(1), 2(11)(c)(ii) (with reg. 3)
F8	Words in Sch. 3 Pt. 2 substituted (11.7.2018) by The Private Water Supplies (England) (Amendment) Regulations 2018 (S.I. 2018/707) , regs. 1(1), 2(11)(c)(iii) (with reg. 3)

F9

F9	Sch. 3 Pt. 2 unnumbered table omitted (11.7.2018) by virtue of The Private Water Supplies (England) (Amendment) Regulations 2018 (S.I. 2018/707) , regs. 1(1), 2(11)(d)(i) (with reg. 3)
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F10

F10	Sch. 3 Pt. 2 Table 2 omitted (11.7.2018) by virtue of The Private Water Supplies (England) (Amendment) Regulations 2018 (S.I. 2018/707) , regs. 1(1), 2(11)(d)(ii) (with reg. 3)
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[^{F11}Table 3

Minimum performance characteristic: uncertainty of measurement

<i>Parameters</i>	<i>Uncertainty of measurement % of the parametric value (except for pH) ⁽¹⁾</i>
Aluminium	25
Ammonium	40
Antimony	40
Arsenic	30

Changes to legislation: There are currently no known outstanding effects for the The Private Water Supplies (England) Regulations 2016, SCHEDULE 3. (See end of Document for details)

<i>Parameters</i>	<i>Uncertainty of measurement % of the parametric value (except for pH) ⁽¹⁾</i>
Benzene	40
Benzo(a)pyrene ⁽²⁾	50
Boron	25
Bromate	40
Cadmium	25
Chloride	15
Chromium	30
Colour	20
Conductivity	20
Copper	25
Cyanide ⁽³⁾	30
1,2-dichloroethane	40
Fluoride	20
Hydrogen ion concentration pH (expressed in pH units)	0.2
Iron	30
Lead	25
Manganese	30
Mercury	30
Nickel	25
Nitrate	15
Nitrite	20
Oxidisability ⁽⁴⁾	50
Pesticides ⁽⁵⁾	30
Polycyclic aromatic hydrocarbons ⁽⁶⁾	50
Selenium	40
Sodium	15
Sulphate	15
Tetracloroethene ⁽⁷⁾	30
Tetrachloromethane	30
Trichloroethene ⁽⁷⁾	40
Trihalomethanes: total ⁽⁶⁾	40
Total organic carbon ⁽⁸⁾	30

<i>Parameters</i>	<i>Uncertainty of measurement % of the parametric value (except for pH) ⁽¹⁾</i>
Turbidity ⁽⁹⁾	30
<p>(1) “Uncertainty of measurement” is a non-negative parameter characterising the dispersion of the quantity values being attributed to a measurement, 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 better. Measurement uncertainty must be estimated at the level of the parametric value.</p> <p>(2) If the value of uncertainty of measurement cannot be met, the best available technique must be selected (up to 60% of the parametric value).</p> <p>(3) The method determines total cyanide in all forms.</p> <p>(4) Reference method: European standard EN ISO 8467 entitled “<i>Water quality - Determination of permanganate index (ISO 8467:1993)</i>”.</p> <p>(5) 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.</p> <p>(6) The performance characteristics apply to individual substances, specified at 25% of the parametric value in Part 1 of Table B in Part 1 of Schedule 1.</p> <p>(7) The performance characteristics apply to individual substances, specified at 50% of the parametric value in Part 1 of Table B in Part 1 of Schedule 1.</p> <p>(8) The uncertainty of measurement must be estimated at the level of 3 mg/l of the total organic carbon (TOC) in accordance with European standard EN 1484 entitled “<i>Water analysis - Guidelines for the determination of total organic carbon and dissolved organic carbon</i>” and dissolved organic carbon (DOC) must be used.</p> <p>(9) The uncertainty of measurement must be estimated at the level of 1.0 nephelometric turbidity units (NTU) in accordance with European standard EN ISO 7027-1 entitled “<i>Water quality - Determination of turbidity - Part 1: Quantitative methods (ISO 7027-1:2016)</i>”.</p>	

F11 Sch. 3 Pt. 2 Table 3 inserted (11.7.2018) by [The Private Water Supplies \(England\) \(Amendment\) Regulations 2018 \(S.I. 2018/707\)](#), regs. 1(1), 2(11)(e) (with reg. 3)

PART 3

Monitoring for indicative dose and analytical performance characteristics

Monitoring for compliance with the ID

5.—(1) A local authority may use various reliable screening strategies to indicate the presence of radioactivity in water intended for human consumption.

(2) These strategies may include screening for—

- (a) certain radionuclides, or screening for an individual radionuclide;
- (b) gross alpha activity or gross beta activity screening.

Screening for certain radionuclides, or screening for an individual radionuclide

6.—(1) If one of the activity concentrations exceeds 20% of the corresponding derived value or the tritium concentration exceeds its parametric value specified in the radioactive parameters table, an analysis of additional radionuclides is required.

(2) A local authority must take into account, in deciding which radionuclides are required to be measured for each supply, all relevant information about likely sources of radioactivity.

Screening strategies for gross alpha activity and gross beta activity

7.—(1) Subject to paragraph 6(1), the recommended screening values are—

- (a) 0.1 Bq/l for gross alpha activity, and
- (b) 1.0 Bq/l for gross beta activity ^{M1}.

(2) If the gross alpha activity exceeds 0.1 Bq/l or the gross beta activity exceeds 1.0 Bq/l, analysis for specific radionuclides is required.

(3) The Secretary of State may set alternative screening levels for gross alpha activity and gross beta activity where it is demonstrated by the local authority that the alternative levels are in compliance with an ID of 0.1 mSv.

(4) The determination by the local authority of which radionuclides to measure must be based on all relevant information about likely sources of radioactivity.

Marginal Citations

- M1** Where appropriate, gross beta activity may be replaced by residual beta activity after subtraction of the K-40 activity concentration.

Calculation of the ID

8.—(1) The ID must be calculated from—

- (a) the measured radionuclide concentrations and the dose coefficients [^{F12}referred to as “standard values and relationships” in Article 13, and recommended for the estimation of doses from internal exposure in the definition of “standard values and relationships” in Article 4(96), of Council Directive 2013/59/Euratom laying down basic safety standards for protection against the dangers arising from exposure to ionising radiation, or]
- (b) more recent information recognised by the Secretary of State, on the basis of the annual intake of water (730 litres for adults).

(2) Where the following formula is satisfied, it can be assumed that the ID is less than the parametric value of 0.1 mSv and no further investigation is required—

$$\sum_{i=1}^n \frac{C_i(\text{obs})}{C_i(\text{der})} \leq 1$$

Where—

“*C_i(obs)*” means the observed concentration of radionuclide *I*;

“*C_i(der)*” means the derived concentration of radionuclide *I*;

“*n*” means the number of radionuclides detected.

Derived concentrations for radioactivity in water intend for human consumption ^{M2}

<i>Origin</i>	<i>Nuclide</i>	<i>Derived concentration</i>
Natural	U-238 ¹	3.0 Bq/l

¹ This Table allows only for the radiological properties of uranium, not for its chemical toxicity.

Changes to legislation: There are currently no known outstanding effects for the *The Private Water Supplies (England) Regulations 2016, SCHEDULE 3*. (See end of Document for details)

Artificial	U-234 ¹	2,8 Bq/l
	Ra-226	0,5 Bq/l
	Ra-228	0,2 Bq/l
	Pb-210	0,2 Bq/l
	Po-210	0,1 Bq/l
	C-14	240 Bq/l
	Sr-90	4,9 Bq/l
	Pu-239/Pu-240	0,6 Bq/l
	Am-241	0,7 Bq/l
	Co-60	40 Bq/l
	Cs-134	7,2 Bq/l
	Cs-137	11 Bq/l
	I-131	6,2 Bq/l

¹ This Table allows only for the radiological properties of uranium, not for its chemical toxicity.

F12 Words in Sch. 3 Pt. 3 para. 8(1)(a) substituted (11.7.2018) by [The Private Water Supplies \(England\) \(Amendment\) Regulations 2018 \(S.I. 2018/707\)](#), regs. 1(1), 2(11)(f) (with reg. 3)

Marginal Citations

M2 This Table includes values for the most common natural and artificial radionuclides; these are precise values, calculated for a dose of 0,1 mSv, an annual intake of 730 litres and using the dose coefficients laid down in Annex III, Table A of Directive 96/29/Euratom. Derived concentrations for other radionuclides can be calculated on the same basis, and values can be updated on the basis of more recent information recognised by the Secretary of State.

Performance characteristics and methods of analysis

9. For the following parameters and radionuclides, the method of analysis used must, as a minimum, be capable of measuring activity concentrations with a limit of detection specified below—

<i>Parameters and radionuclides</i>	<i>Limit of detection (Notes 1,2)</i>	<i>Notes</i>
Tritium	10 Bq/l	Note 3
Radon	10 Bq/l	Note 3
gross alpha	0,04 Bq/l	Note 4
gross beta	0,4 Bq/l	Note 4
U-238	0,02 Bq/l	
U-234	0,02 Bq/l	
Ra-226	0,04 Bq/l	
Ra-228	0,02 Bq/l	Note 5

Pb-210	0,02 Bq/l
Po-210	0,01 Bq/l
C-14	20 Bq/l
Sr-90	0,4 Bq/l
Pu-239/Pu-240	0,04 Bq/l
Am-241	0,06 Bq/l
Co-60	0,5 Bq/l
Cs-134	0,5 Bq/l
Cs-137	0,5 Bq/l
I-131	0,5 Bq/l

Note 1: The limit of detection must be calculated according to the ISO standard 11929: Determination of the characteristic limits (decision threshold, detection limit, and limits of confidence interval) for measurements of ionising radiation – Fundamentals and application, with probabilities of errors of 1st and 2nd kind of 0,05 each ^{M3}.

Note 2: Measurement uncertainties must be calculated and reported as complete standard uncertainties, or as expanded uncertainties with an expansion factor of 1,96 according the ISO Guide for the Expression of Uncertainty in Measurement ^{M4}.

Note 3: The limit of detection for tritium and for radon is 10% of its parametric value of 100 Bq/l.

Note 4: The limit of detection for gross alpha activity and gross beta activities are 40% of the screening values of 0,1 and 1,0 Bq/l respectively.

Note 5: This limit of detection applies only to initial screening for ID for a new water source; if initial checking indicates that it is not plausible 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.

Marginal Citations

M3 A copy may be obtained at www.iso.org or from the Drinking Water Inspectorate, Area 7E, 9 Millbank, c/o Nobel House, 17 Smith Square, London, SW1P 3JR.

M4 See previous footnote.

Changes to legislation:

There are currently no known outstanding effects for the The Private Water Supplies (England) Regulations 2016, SCHEDULE 3.