

EUROPEAN COMMUNITIES (QUALITY OF WATER INTENDED FOR HUMAN CONSUMPTION) REGULATIONS, 1988.

The Minister for the Environment in exercise of the powers conferred on him by section 3 of the European Communities Act, 1972 (No. 27 of 1972) and for the purpose of giving effect to the Council Directive of 15th July, 1980 (No. 80/778/EEC)(1) hereby makes the following Regulations:

(1)O.J. No. L229/11. 30th August, 1980.

1. (1) These Regulations may be cited as the European Communities (Quality of Water Intended for Human Consumption) Regulations, 1988.
- (2) These Regulations shall come into operation on the 1st day of June, 1988.

2. In these Regulations:

any reference to the Schedule or an article which is not otherwise identified is a reference to the Schedule or an article of these Regulations;

any reference to a sub-article which is not otherwise identified is a reference to a sub-article of the provision in which the reference occurs;

"authorised person" means a person appointed by a sanitary authority to be an authorised person for the purposes of these Regulations;

"group water installation" means a private water supply utilising a common source or sources and serving more than one dwelling;

"the Minister" means the Minister for the Environment;

"monitoring" includes inspection, measurement, sampling or analysis whether periodically or continuously;

"premises" includes any land, any waterworks as defined in section 2 of the Public Health (Ireland) Act, 1878 and any building, structure or private dwelling;

"sanitary authority" means a sanitary authority for the purposes of the Local Government (Sanitary Services) Acts, 1878 to 1964;

"water intended for human consumption" means all water used for that purpose, either in its original state or after treatment, regardless of origin, and whether:

- (a) supplied for consumption, or
- (b) used in a food production undertaking for the manufacture, processing, preservation or marketing of products or substances intended for human consumption, and affecting the wholesomeness of the foodstuff in its finished form, other than natural mineral waters recognised by the responsible authority as defined in the European Communities (Natural Mineral Waters) Regulations, 1986 (S.I. No. 11 of 1986).

3. (1) Water intended for human consumption shall meet the quality standards specified in Part 1 of the Schedule.

(2) A sanitary authority shall take account of the comments included in the "comments" column of Tables A to F of Part 1 of the Schedule in applying the standards referred to in sub-article (1).

4. It shall be the duty of a sanitary authority to take the necessary measures to ensure that:

- (a) water intended for human consumption meets the requirements of these Regulations, except where a departure is granted under article 5, and

- (b) any substances used in the preparation of water for human consumption do not remain, in concentrations higher than the maximum admissible concentration (if any) relating to those substances, in water made available to the user, and that they do not, directly or indirectly, constitute a public health hazard.
5. (1) A departure from the requirements of these Regulations may be granted by the Minister to a sanitary authority to take account of:
- (a) situations arising from the nature and structure of the ground in the area from which the water supply in question emanates,
  - (b) situations arising from exceptional meteorological conditions.
- (2) An application for a departure under this article shall contain such information as may be specified by the Minister.
- (3) The granting of a departure under this article shall be subject to such conditions, if any, and shall have effect for such period, as may be specified by the Minister.
- (4) A departure under this article shall not relate to toxic or microbiological parameters and shall not constitute a public health hazard.
- (5) Without prejudice to sub-article (4), nothing in this article shall preclude the Minister from granting a departure on foot of an application received before the commencement of these Regulations.
6. (1) In the event of an emergency, a sanitary authority may, for a limited period of time, allow a maximum admissible concentration shown in Part I of the Schedule to be exceeded provided that:
- (a) the supply of water for human consumption cannot otherwise be maintained, and
  - (b) the higher concentration determined by the authority does not constitute an unacceptable risk to public health.
- (2) Where, in order to enable a supply of water for human consumption to be maintained, a sanitary authority is obliged:
- (a) to use, or in the case of a private water supply to allow use of, a surface water source which does not have the physical, chemical and microbiological characteristics required of category A3 water within the meaning of article 2 of Council Directive 75/440/EEC of 16th June, 1975, and (2)O.J. No. L194/26. 25th July, 1975.
  - (b) the authority cannot devise, or in the case of a private water supply cannot approve, suitable treatment to obtain a water supply complying with these Regulations,  
the authority may allow a maximum admissible concentration shown in Part I of the Schedule to be exceeded for a limited period of time provided that the higher concentration determined by the authority does not constitute an unacceptable risk to public health.
- (3) Sub-article (2) shall apply notwithstanding the provisions of Council Directive 75/440/EEC of 16th June, 1975 (2) and, in particular, article 4 (3) of that Council Directive.
- (4) A sanitary authority shall notify the Minister as soon as may be of any action taken under sub-articles (1) or (2), stating the reasons for such action, the higher concentration determined and the period of time for which such higher concentration is allowed by the authority.
7. (1) A sanitary authority shall regularly monitor the quality of water intended for human consumption at the point where it is made available to the user, and for this purpose samples shall be taken for analysis at such points as the sanitary authority shall determine.
- (2) For the purposes of sub-article (1), a sanitary authority shall, subject to sub-article (3):
- (a) apply the patterns of standard analyses specified in Table A of Part II of the Schedule, and
  - (b) have regard to the minimum frequencies of standard analyses specified in Table B of Part II of the Schedule.
- (3) Notwithstanding sub-article (2), in the case of a water supply serving less than 1,000 persons or producing or distributing less than 200 cubic metres of water a day, a sanitary authority shall monitor the quality of the water on such occasions and to such extent as they shall consider necessary, having regard to:
- (a) the pattern of standard analyses specified in Table A of Part II of the Schedule,
  - (b) their knowledge of the quality of water in their functional area or any part thereof, and
  - (c) any factors, coming to their attention, which are likely to cause a deterioration in the quality of water.

- (4) For the purposes of this article, a sanitary authority shall:
    - (a) as far as practicable, use the methods of analysis specified in Part III of the Schedule, and
    - (b) where other methods of analysis are used, ensure that the results obtained are equivalent to, or comparable with, results obtained by the methods specified in Part III of the Schedule.
  - (5) Notwithstanding sub-article (3), water intended for use in a food production undertaking and affecting the wholesomeness of the foodstuff in its finished form shall be monitored at least once a year.
  - (6) Where water intended for human consumption requires to be disinfected, microbiological analysis shall be twice as frequent as the minimum frequencies shown in Table B of Part II of the Schedule.
  - (7) Where frequent analyses are required, samples shall be taken as regularly as practicable.
  - (8) Where the values of the results obtained from samples taken during the preceding two years are constant and are significantly better than the values specified in Part I of the Schedule, and no factor likely to cause deterioration in the quality of the water has been discovered, a sanitary authority may reduce the minimum frequencies of analyses:
    - (a) for surface waters by a factor of two, with the exception of the minimum frequencies for microbiological analyses,
    - (b) for ground waters by a factor of four, without prejudice to sub-article (6).
8. Where it is found, as a result of monitoring carried out under article 7, that the quality of water intended for human consumption does not meet the requirements of these Regulations, the sanitary authority shall:
- (a) take all reasonable steps to warn users of the water supply where there is an unacceptable risk to public health,
  - (b) in the case of a public water supply, prepare an action programme for the improvement of the quality of the water as soon as practicable,
  - (c) in the case of a private water supply, notify the person or persons responsible for the supply as soon as practicable of the measures which should be taken for the improvement of the quality of the water.
9. (1) An authorised person may at all reasonable times enter any premises for the purposes of these Regulations.
- (2) When exercising the power conferred by this article, an authorised person shall, if so required, produce evidence of his authority.
10. (1) A sanitary authority may charge for monitoring the quality of private water supplies intended for human consumption.
- (2) A charge made by a sanitary authority by virtue of sub-article (1) shall be of such amount as the authority considers appropriate but shall not exceed the cost of such monitoring.
- (3) A charge made by a sanitary authority by virtue of sub-article (1) shall be payable by and recoverable from:—
- (a) in the case of a group water installation, the trustees or other persons responsible for that installation, and
  - (b) in any other case, the occupier or occupiers of the premises supplied.
- (4) A sanitary authority may recover the amount of any charge made by them under this article from the person or persons by whom it is payable as a simple contract debt in any court of competent jurisdiction.
11. The Minister may, from time to time, issue recommendations to sanitary authorities in relation to the carrying out of any of their duties under these Regulations, and sanitary authorities shall have regard to any such recommendations.
12. Measures taken to apply the provisions of these Regulations shall in no case have the effect of allowing, directly or indirectly, any deterioration in the existing quality of water intended for human consumption or an increase in the pollution of waters used for the production of drinking water.

## SCHEDULE

### PART I

#### QUALITY STANDARDS

##### A. ORGANOLEPTIC PARAMETERS

Parameters Expression of the Results

Maximum Admissible Concentration

(MAC)

Comments

1 Colour mg/l Pt/Co Scale 20

2 Turbidity mg/l SiO<sub>2</sub> 10 Jackson units Nephelometric units} 4

3 Odour Dilution number 2 at 12°C to be related to the taste tests. 3 at 25°C

4 Taste

Dilution number 2 at 12°C To be related to the odour tests. 3 at 25°C

##### B. PHYSICO-CHEMICAL PARAMETERS

(In relation to the water's natural structure)

Parameters Expression of the Results

Maximum Admissible Concentration (MAC)

Comments

5 Temperature °C 25

6 Hydrogen ion concentration pH unit 6.0 < Ph < 9.0. The water should not be aggressive. The ph values do not apply to water in closed containers.

7 Conductivity uS cm<sup>-1</sup> at 20°C 1,500 Corresponding to 1,650 at 25°C

8 Chlorides Cl mg/l 250

9 Sulphates SO<sub>4</sub> mg/l 250

10 Calcium Ca mg/l 200

11 Magnesium Mg mg/l 50

12 Sodium Na mg/l 150 If, owing to its excessive natural hardness, water is softened in accordance with Table F before being supplied for consumption, its sodium content may, in exceptional cases, be higher than the MAC value. The sodium content in such cases should be kept at as low a level as possible and the essential requirements for the protection of public health may not be disregarded. (with a percentile of 80) (This percentile should be calculated over a reference period of three years)

13 Potassium K mg/l 12

14 Aluminium Al mg/l 0.2

15 Dry residues mg/l after drying at 180°C 1,000

##### C. PARAMETERS CONCERNING SUBSTANCES UNDESIRABLE IN EXCESSIVE AMOUNTS

16 Nitrates NO<sub>3</sub> mg/l 50 Equivalent to 11.3 mg/l as N.

17 Nitrites NO<sub>2</sub> mg/l 0.1 Equivalent to 0.03 mg/l as N.

18 Ammonium NH<sub>4</sub> mg/l 0.3 Equivalent to 0.23 mg/l as N.

19 Kjeldahl Nitrogen (excluding N in NO<sub>2</sub> and NO<sub>3</sub>) N mg/l 1

20 (K MN O<sub>4</sub>) O<sub>2</sub> mg/l 5 Measured when heated in acid medium.

21 Hydrogen sulphide S ugh/l Undetectable organoleptically.

22 Substances extractable in chloroform mg/l dry residue No significant increase above background level.

23 Dissolved or emulsified hydrocarbons (after extraction by petroleum ether); Mineral oils ug/l 10  
24 Phenols (phenol index) C<sub>6</sub>H<sub>5</sub>OH ug/l 0.5 Excluding natural phenols which do not react to chlorine.  
25 Boron B ug/l 2,000  
26 Surfactants (reacting with methylene blue) ug/l (lauryl sulphate) 200  
27 Other organochlorine compounds not covered by parameter No. 46 ug/l 100 Haloform concentrations must be as low as possible.  
28 Iron Fe ug/l 200  
29 Manganese Mn ug/l 50  
30 Copper Cu ug/l 500  
— at outlets of pumping and/or treatment works and their substations 3,000  
— after the water has been standing for 12 hours in the piping and at the point where the water is made available to the consumer.

31 Zinc Zn ug/l 1,000  
— at outlets of pumping and/or treatment works and their substations 5,000  
— after the water has been standing for 12 hours in the piping where the water is made available to the consumer.

32 Phosphorus P<sub>2</sub>O<sub>5</sub> Ug/l 5,000

33 Fluoride F ug/l 1,000

34 Suspended solids mg/l No persistently visible suspended solids.

35 Barium Ba ug/l 500

36 Silver Ag ug/l 10 If, exceptionally, silver is used non-systematically to process the water, a MAC value of 80 ug/l shall apply.

#### D. PARAMETERS CONCERNING TOXIC SUBSTANCES

37 Arsenic As ug/l 50

38 Cadmium Cd ug/l 5

39 Cyanides CN ug/l 50

40 Chromium Cr ug/l 50

41 Mercury Hg ug/l 1

42 Nickel Ni ug/l 50

43 Lead Pb ug/l 50 (in running water)

Where lead pipes are present, the lead content should not exceed 50 ug/l in a sample is taken either directly or after flushing and the lead content either frequently or to an appreciable extent exceeds 100 ug/l, suitable measures must be taken to reduce the exposure to lead on the part of the consumer.

44 Antimony Sb ug/l 10

45 Selenium Se ug/l 10

46 Pesticides and related products

—substances considered separately

ug/l 0.1 "Pesticides and related products" means:

—insecticides

—persistent

organochlorine

compounds

—organophosphorous compounds

—carbarnates

—total 0.5 —herbicides

—fungicides

—PCBs

(Polychlorinated Biphenyls) and PCTs (Polychlorinated Terphenyls).

47 Polycyclic

aromatic

hydrocarbons

ug/l 0.2 "Reference substances" means:

—fluoranthene

—3, 4

benzofluoranthene

—11, 12

benzofluoranthene

—3, 4 benzpyrene

—1, 12 benzperylene

—Indeno (1, 2, 3 - cd)

pyrene.

#### E. MICROBIOLOGICAL PARAMETERS

Parameters Results:

volume of the sample in ml

Maximum

Admissible

Concentration

(MAC)

Comments

Membrane

Filter

Method

Multiple

tube

Method

(MPN)

Water intended for human consumption should not contain pathogenic organisms, nor should such water contain parasites, algae or other organisms such as animalcules. Where it is necessary to supplement the microbiological analysis of water intended for human consumption, the samples should also be examined for pathogens including salmonella, pathogenic staphylococci, fecal bacteriophages, and entero-viruses.  
48 Total

coliforms(1)

100 0 MPN  
49 Fecal

coliforms

100 0 MPN  
50 Fecal

coliforms

100 0 MPN  
51 Sulphite

reducing

Clostridia

20 — MPN  $\leq$  1  
Results:

size of sample in

ml

Maximum

Admissible

Concentration

(MAC)

52 Total bacteria counts for water supplied for human consumption 37° 1 No significant increase above background level.  
22°C 1

53 Total bacteria counts for water in closed containers 37°C 1 20  
22°C 1 100

(1) Provided a sufficient number of samples is examined (95% consistent results).

## F. MINIMUM REQUIRED CONCENTRATION FOR SOFTENED WATER INTENDED FOR HUMAN CONSUMPTION

Parameters Expression of the

Results

Minimum Required Concentration (MRC)

Comments

1 Total hardness mg/l Ca 60 Calcium or equivalent cations.

2 Alkalinity mg/l HCO<sub>3</sub> 30 The water should not be aggressive.

### PART II

## PATTERNS AND FREQUENCY OF STANDARD ANALYSES

### A. TABLE OF STANDARD PATTERN ANALYSES

(Parameters to be considered in monitoring)

Standard analyses Minimum monitoring (1)

(analysis C1)

Current monitoring (1)

(Analysis C2)

Periodic

monitoring

(Analysis C3)

Occasional monitoring in special situations or in case of accidents

(Analysis C4)

Parameters to be considered

A ORGANOLEPTIC PARAMETERS — odour(2)

— taste(2)

### B PHYSICO-CHEMICAL

PARAMETERS

—Conductivity or other physico-chemical parameter —temperature(3)

—conductivity or other physico-chemical parameter

—pH

C UNDESIRABLE PARAMETERS — nitrates

—nitrates

—ammonia

D TOXIC PARAMETERS  
E MICRO-

BIOLOGICAL PARAMETERS

—total coliforms or total counts of 22° and 37°

—fecal coliforms

—total coliforms

—fecal coliforms

—total counts of 22° and 37

(1) Residual chlorine or other disinfectants used in treatment must also be monitored having regard to public health requirements in accordance with article 4 (b).

(2) Qualitative assessment.

(3) Except for water supplied in containers.

(4) These parameters shall be determined by the sanitary authority, having regard to all factors which may affect the quality of drinking water supplied to users and which may enable the ionic balance of the constituents to be assessed.

(5) A sanitary authority may consider parameters other than those included in Part I of the Schedule to these Regulations.

B. TABLE OF MINIMUM FREQUENCY OF STANDARD ANALYSES

Volume of water produced or distributed in m<sup>3</sup>/day Population concerned (assuming 200 l/day per person)  
Analysis C1 Analysis C2 Analysis C3 Analysis C4

Minimum No. of samples per year. Frequency to be determined by the sanitary authority as the situation requires.

200 1,000 2 1 (1)

500 2,500 3 1 (1)

1,000 5,000 6 2 1

2,000 10,000 12 3 1

10,000 50,000 60 6 1

20,000 100,000 120 12 2

30,000 150,000 180 18 3

60,000 300,000 360 36 6

100,000 500,000 360 60 10

200,000 1,000,000 360 120 20

(1) Frequency to be determined by the sanitary authority but the requirement in article 7 (5) shall also apply.

PART III

METHODS OF ANALYSIS (1)

A. ORGANOLEPTIC PARAMETERS

1 Colour Photometric method calibrated on the Pt/co scale.

2 Turbidity Silica method - Formazine test.

3 Odour Successive dilutions, tested at 12°C or 25°C.

4 Taste Successive dilutions, tested at 12°C or 25°C.

B. PHYSICO-CHEMICAL PARAMETERS

5 Temperature Thermometry

6 Hydrogen ion concentration Electrometry.

7 Conductivity Electrometry.

8 Chlorides Titrimetry — Mohr's method.

9 Sulphates Gravimetry — complexometry — spectrophotometry.

- 10 Calcium Atomic absorption— complexometry.
- 11 Magnesium Atomic absorption.
- 12 Sodium Atomic Absorption.
- 13 Potassium Atomic absorption.
- 14 Aluminium Atomic absorption — absorption spectrophotometry.
- 15 Dry residues Dessication at 180°C and weighing.

#### C. PARAMETERS CONCERNING UNDESIRABLE SUBSTANCES

- 16 Nitrates Absorption spectrophotometry — Specific electrode method.
- 17 Nitrites Absorption spectrophotometry.
- 18 Ammonium Absorption spectrophotometry.
- 19 Kjeldahl Nitrogen Oxidation with Titrimetry or Absorption spectrophotometry.
- 20 Oxidizability Boiling for 10 minutes with KMnO<sub>4</sub> in acid medium.
- 21 Hydrogen sulphide Absorption spectrophotometry.
- 22 Substances extractable in chloroform Liquid/liquid extraction using purified chloroform at neutral pH, weighing the residue.
- 23 Hydrocarbons (dissolved or in emulsion); Mineral oils Infra-red absorption spectrophotometry.
- 24 Phenols (phenol index) Absorption spectrophotometry, paranitro-aniline method and 4-aminoantipyrine method.
- 25 Boron Atomic absorption — Absorption spectrophotometry.
- 26 Surfactants (reacting with methylene blue) Absorption spectrophotometry with methylene blue.
- 27 Other organochlorine compounds Gas-phase or liquid-phase chromatography after extraction by appropriate solvents and purification — identification of the constituents of mixtures if necessary. Quantitative determination.
  - (1) The method of analysis to be used for residual chlorine is titrimetry — absorption spectrophotometry.
- 28 Iron Atomic absorption — Absorption spectrophotometry.
- 29 Manganese Atomic absorption — Absorption spectrophotometry.
- 30 Copper Atomic absorption — Absorption spectrophotometry
- 31 Zinc Atomic absorption — Absorption spectrophotometry.
- 32 Phosphorus Absorption spectrophotometry.
- 33 Fluoride Absorption spectrophotometry — Specific electrode method.
- 34 Suspended solids Method of filtration on to a 0.45 porous membrane or centrifuging (for at least 15 minutes with an average acceleration of 2,800 to 3,200 g) dried at 105°C and weighed.
- 35 Barium Atomic absorption.
- 36 Silver Atomic absorption.

#### D. PARAMETERS CONCERNING TOXIC SUBSTANCES

- 37 Arsenic Absorption spectrophotometry — Atomic absorption.
- 38 Cadmium Atomic absorption.
- 39 Cyanides Absorption spectrophotometry.
- 40 Chromium Atomic absorption — Absorption spectrophotometry.
- 41 Mercury Atomic absorption.
- 42 Nickel Atomic absorption.
- 43 Lead Atomic absorption.
- 44 Antimony Absorption spectrophotometry.
- 45 Selenium Atomic absorption.
- 46 Pesticides and related products See method 27.
- 47 Polycyclic aromatic hydrocarbons Measurement of intensity of fluorescence ultraviolet after extraction using hexane — gas-phase — chromatography or measurement in ultra-violet after thin layer chromatography — Comparative measurements against a mixture of six standard substances of the same concentration (1)

#### E. MICROBIOLOGICAL PARAMETERS

Fermentation in multiple tubes. Subculturing of the positive tubes on a confirmation medium. Count according to MPN (most probable number)

48(2)

49(2)

Total coliforms

Fecal coliforms

Membrane filtration and culture on an appropriate medium such as Tergitol lactose agar, endo agar, 0.4% Teepol broth, sub-culturing and identification of the suspect colonies—

Incubation temperature for total coliforms: 37°C

Incubation temperature for fecal coliforms: 44°C

(1) Standard substances to be considered: fluoranthene, 3, 4 — benzofluoranthene, 11, 12 — benzofluoranthene, 3, 4 — benzpyrene, 1, 12 — benzperylene, Indeno (1, 2, 3 — cd) pyrene.

(2) The incubation period is generally 24 or 48 hours except for total counts, when it is 48 or 72 hours.

50(2) Fecal streptococci

Membrane filtration and culture on an appropriate medium.

51(2) Sulphite-reducing Clostridia A spore count, after heating the sample to 80°C by:

— seeding in a medium with glucose, sulphite and iron, counting the black-halo colonies;

— membrane filtration, deposition of the inverted filter on a medium with glucose, sulphite and iron covered with agar, count of black colonies;

— distribution in tubes of differential reinforced clostridial medium (DRCM), subculturing of the black tubes in a medium of litmus-treated milk, count according to MPN.

52/53(2) Total counts Innoculation by placing in nutritive agar.

#### ADDITIONAL TESTS

Salmonella Concentration by membrane filtration. Innoculation on a pre-enriched medium. Enrichment, subculturing on isolating agar. Identification.

Pathogenic staphylococci Membrane filtration and culture on a specific medium (e.g. Chapman's hypersaline medium). Test for pathogenic characteristics.

Fecal bacteriophages Guelin's process.

Enteroviruses Concentration by filtration, flocculation or centrifuging, and identification.

Protozoa Concentration by filtration on a membrane, microscopic examination, test for pathogenicity.

Animalcules (worms — larvae) Concentration by filtration on a membrane. Microscopic examination, test for pathogenicity.

#### F. MINIMUM REQUIRED CONCENTRATION

Total hardness Complexometry

Alkalinity Acidimetry with Methyl orange

(2) The incubation period is generally 24 or 48 hours except for total counts, when it is 48 or 72 hours.

GIVEN under the Official Seal of the Minister for the Environment this 29th day of April, 1988.

PADRAIG FLYNN,

Minister for the Environment

#### EXPLANATORY NOTE.

These Regulations prescribe standards for water intended for human consumption and the patterns and frequency of analyses required in order to monitor such standards. The Regulations give effect to Council

Directive No. 80/778/EEC of 15th July, 1980 (O.J. No. L229/11, 30th August, 1980) relating to the quality of water intended for human consumption.