ANNEX I

PARAMETERS AND PARAMETRIC VALUES

PART A

**Microbiological parameters**

| **Parameter** | **Parametric value(number/100 ml)** |
|---|---|
| *Escherichia coli (E. coli)* | 0 |
| Enterococci | 0 |

The following applies to water offered for sale in bottles or containers:

| **Parameter** | **Parametric value** |
|---|---|
| *Escherichia coli (E. coli)* | 0/250 ml |
| Enterococci | 0/250 ml |
| *Pseudomonas aeruginosa* | 0/250 ml |
| Colony count 22 °C | 100/ml |
| Colony count 37 °C | 20/ml |

PART B

**Chemical parameters**

| **Parameter** | **Parametric value** | **Unit** | **Notes** |
|---|---|---|---|
| Acrylamide | 0,1 | µg/l | Note 1 |
| Antimony | 5,0 | µg/l | |
| Arsenic | 10 | µg/l | |
| Benzene | 1,0 | µg/l | |
| Benzo(a)pyrene | 0,01 | µg/l | |
| Boron | 1,0 | mg/l | |
| Bromate | 10 | µg/l | Note 2 |
| Cadmium | 5,0 | µg/l | |
| Chromium | 50 | µg/l | |
| Copper | 2,0 | mg/l | Note 3 |
| Cyanide | 50 | µg/l | |
| 1,2-dichloroethane | 3,0 | µg/l | |
| Epichlorohydrin | 0,1 | µg/l | Note 1 |

| | | | |
|---|---|---|---|
| Fluoride | 1,5 | mg/l | |
| Lead | 10 | µg/l | Notes 3 and 4 |
| Mercury | 1,0 | µg/l | |
| Nickel | 20 | µg/l | Note 3 |
| Nitrate | 50 | mg/l | Note 5 |
| Nitrite | 0,5 | mg/l | Note 5 |
| Pesticides | 0,1 | µg/l | Notes 6 and 7 |
| Pesticides — Total | 0,5 | µg/l | Notes 6 and 8 |
| Polycyclic aromatic hydrocarbons | 0,1 | µg/l | Sum of concentrations of specified compounds; Note 9 |
| Selenium | 10 | µg/l | |
| Tetrachloroethene and Trichloroethene | 10 | µg/l | Sum of concentrations of specified parameters |
| Trihalomethanes — Total | 100 | µg/l | Sum of concentrations of specified compounds; Note 10 |
| Vinyl chloride | 0,5 | µg/l | Note 1 |

Note 1:

The parametric value refers to the residual monomer concentration in the water as calculated according to specifications of the maximum release from the corresponding polymer in contact with the water.
Note 2:

Where possible, without compromising disinfection, Member States should strive for a lower value.

For the water referred to in Article 6(1)(a), (b) and (d), the value must be met, at the latest, 10 calendar years after the entry into force of the Directive. The parametric value for bromate from five years after the entry into force of this Directive until 10 years after its entry into force is 25 µg/l.
Note 3:

The value applies to a sample of water intended for human consumption obtained by an adequate sampling method[1] at the tap and taken so as to be representative of a weekly average value ingested by consumers. Where appropriate the sampling and monitoring methods must be applied in a harmonised fashion to be drawn up in accordance with Article 7(4). Member States must take account of the occurrence of peak levels that may cause adverse effects on human health.
Note 4:

For water referred to in Article 6(1)(a), (b) and (d), the value must be met, at the latest, 15 calendar years after the entry into force of this Directive. The parametric value for lead from five years after the entry into force of this Directive until 15 years after its entry into force is 25 µg/l.

Member States must ensure that all appropriate measures are taken to reduce the concentration of lead in water intended for human consumption as much as possible during the period needed to achieve compliance with the parametric value.

When implementing the measures to achieve compliance with that value Member States must progressively give priority where lead concentrations in water intended for human consumption are highest.
Note 5:

Member States must ensure that the condition that [nitrate]/50 + [nitrite]/3 ≤ 1, the square brackets signifying the concentrations in mg/l for nitrate ($NO_3$) and nitrite ($NO_2$), is complied with and that the value of 0,10 mg/l for nitrites is complied with ex water treatment works.
Note 6:

'Pesticides' means:
— organic insecticides,
— organic herbicides,
— organic fungicides,
— organic nematocides,
— organic acaricides,
— organic algicides,
— organic rodenticides
— organic slimicides,
— related products (*inter alia*, growth regulators)

and their relevant metabolites, degradation and reaction products.

Only those pesticides which are likely to be present in a given supply need be monitored.
Note 7:

The parametric value applies to each individual pesticide. In the case of aldrin, dieldrin, heptachlor and heptachlor epoxide the parametric value is 0,030 µg/l.
Note 8:

'Pesticides — Total' means the sum of all individual pesticides detected and quantified in the monitoring procedure.
Note 9:

The specified compounds are:
— benzo(b)fluoranthene,
— benzo(k)fluoranthene,
— benzo(ghi)perylene,
— indeno(1,2,3-cd)pyrene.
Note 10:

Where possible, without compromising disinfection, Member States should strive for a lower value.

The specified compounds are: chloroform, bromoform, dibromochloromethane, bromodichloromethane.

For the water referred to in Article 6(1)(a), (b) and (d), the value must be met, at the latest, 10 calendar years after the entry into force of this Directive. The parametric value for total THMs from five years after the entry into force of this Directive until 10 years after its entry into force is 150 µg/l.

Member States must ensure that all appropriate measures are taken to reduce the concentration of THMs in water intended for human consumption as much as possible during the period needed to achieve compliance with the parametric value.

When implementing the measures to achieve this value, Member States must progressively give priority to those areas where THM concentrations in water intended for human consumption are highest.

PART C

**Indicator parameters**

| Parameter | Parametric value | Unit | Notes |
|---|---|---|---|
| Aluminium | 200 | µg/l | |
| Ammonium | 0,50 | mg/l | |
| Chloride | 250 | mg/l | Note 1 |
| *Clostridium perfringens* (including spores) | 0 | number/100 ml | Note 2 |
| Colour | Acceptable to consumers and no abnormal change | | |
| Conductivity | 2 500 | µS $cm^{-1}$ at 20 °C | Note 1 |
| Hydrogen ion concentration | ≥ 6,5 and ≤ 9,5 | pH units | Notes 1 and 3 |
| Iron | 200 | µg/l | |
| Manganese | 50 | µg/l | |
| Odour | Acceptable to consumers and no abnormal change | | |
| Oxidisability | 5,0 | mg/l $O_2$ | Note 4 |
| Sulphate | 250 | mg/l | Note 1 |
| Sodium | 200 | mg/l | |
| Taste | Acceptable to consumers and no abnormal change | | |
| Colony count 22º | No abnormal change | | |
| Coliform bacteria | 0 | number/100 ml | Note 5 |

| | | | |
|---|---|---|---|
| Total organic carbon (TOC) | No abnormal change | | Note 6 |
| Turbidity | Acceptable to consumers and no abnormal change | | Note 7 |

RADIOACTIVITY

| **Parameter** | **Parametric value** | **Unit** | **Notes** |
|---|---|---|---|
| Tritium | 100 | Bq/l | Notes 8 and 10 |
| Total indicative dose | 0,10 | mSv/year | Notes 9 and 10 |

Note 1:

The water should not be aggressive.
Note 2:

This parameter need not be measured unless the water originates from or is influenced by surface water. In the event of non-compliance with this parametric value, the Member State concerned must investigate the supply to ensure that there is no potential danger to human health arising from the presence of pathogenic micro-organisms, e.g. cryptosporidium. Member States must include the results of all such investigations in the reports they must submit under Article 13(2).
Note 3:

For still water put into bottles or containers, the minimum value may be reduced to 4,5 pH units.

For water put into bottles or containers which is naturally rich in or artificially enriched with carbon dioxide, the minimum value may be lower.
Note 4:

This parameter need not be measured if the parameter TOC is analysed.
Note 5:

For water put into bottles or containers the unit is number/250 ml.
Note 6:

This parameter need not be measured for supplies of less than 10 000 $m^3$ a day.
Note 7:

In the case of surface water treatment, Member States should strive for a parametric value not exceeding 1,0 NTU (nephelometric turbidity units) in the water ex treatment works.
Note 8:

Monitoring frequencies to be set later in Annex II.
Note 9:

Excluding tritium, potassium -40, radon and radon decay products; monitoring frequencies, monitoring methods and the most relevant locations for monitoring points to be set later in Annex II.
Note 10:

1. **[**[F1]The Commission shall adopt the measures required under Note 8 on monitoring frequencies, and Note 9 on monitoring frequencies, monitoring methods and the most relevant locations for monitoring points in Annex II. Those measures, designed to

amend non-essential elements of this Directive, shall be adopted in accordance with the regulatory procedure with scrutiny referred to in Article 12(3).

When elaborating those measures the Commission shall take into account, inter alia, the relevant provisions under existing legislation or appropriate monitoring programmes including monitoring results as derived from them.**]**

2. A Member State is not required to monitor drinking water for tritium or radioactivity to establish total indicative dose where it is satisfied that, on the basis of other monitoring carried out, **[**[X1]the levels of tritium or the calculated total indicative dose**]** are well below the parametric value. In that case, it shall communicate the grounds for its decision to the Commission, including the results of this other monitoring carried out.

## ANNEX II

## MONITORING

TABLE AParameters to be analysed

1. Check monitoring

The purpose of check monitoring is regularly to provide information on the organoleptic and microbiological quality of the water supplied for human consumption as well as information on the effectiveness of drinking-water treatment (particularly of disinfection) where it is used, in order to determine whether or not water intended for human consumption complies with the relevant parametric values laid down in this Directive.

The following parameters must be subject to check monitoring. Member States may add other parameters to this list if they deem it appropriate.

Aluminium (Note 1)
Ammonium
Colour
Conductivity
*Clostridium perfringens* (including spores) (Note 2)
*Escherichia coli (E. coli)*
Hydrogen ion concentration
Iron (Note 1)
Nitrite (Note 3)
Odour
*Pseudomonas aeruginosa* (Note 4)
Taste
Colony count 22 °C and 37 °C (Note 4)
Coliform bacteria
Turbidity

| | |
|---|---|
| *Note 1:* | Necessary only when used as flocculant[a]. |
| *Note 2:* | Necessary only if the water originates from or is influenced by surface water[a]. |

**a** In all other cases, the parameters are in the list for audit monitoring.

| | |
|---|---|
| *Note 3:* | Necessary only when chloramination is used as a disinfectant[a]. |
| *Note 4:* | Necessary only in the case of water offered for sale in bottles or containers. |

**a** In all other cases, the parameters are in the list for audit monitoring.

## [F1 2. Audit monitoring

The purpose of audit monitoring is to provide the information necessary to determine whether or not all of the Directive's parametric values are being complied with. All parameters set in accordance with Article 5(2) and (3) must be subject to audit monitoring unless it can be established by the competent authorities, for a period of time to be determined by them, that a parameter is not likely to be present in a given supply in concentrations which could lead to the risk of a breach of the relevant parametric value. This point does not apply to the parameters for radioactivity, which, subject to Notes 8, 9 and 10 in Annex I, Part C, will be monitored in accordance with monitoring requirements adopted by the Commission. Those measures, designed to amend non-essential elements of this Directive by supplementing it, shall be adopted in accordance with the regulatory procedure with scrutiny referred to in Article 12(3).**]**

TABLE B1 Minimum frequency of sampling and analyses for water intended for human consumption supplied from a distribution network or from a tanker or used in a food-production undertaking

Member States must take samples at the points of compliance as defined in Article 6(1) to ensure that water intended for human consumption meets the requirements of the Directive. However, in the case of a distribution network, a Member State may take samples within the supply zone or at the treatment works for particular parameters if it can be demonstrated that there would be no adverse change to the measured value of the parameters concerned.

| **Volume of water distributed or produced each day within a supply zone(Notes 1 and 2)$m^3$** | | **Check monitoring number of samples per year(Notes 3, 4 and 5)** | **Audit monitoring number of samples per year(Notes 3 and 5)** |
|---|---|---|---|
| | ≤ 100 | (Note 6) | (Note 6) |
| > 100 | ≤ 1 000 | 4 | 1 |
| > 1 000 | ≤ 10 000 | 4<br>+ 3 for each 1<br>000 $m^3$/d and part thereof of the total volume | 1<br>+ 1 for each 3<br>300 $m^3$/d and part thereof of the total volume |
| > 10 000 | ≤ 100 000 | | 3<br>+ 1 for each 10<br>000 $m^3$/d and part thereof of the total volume |
| > 100 000 | | | 10<br>+ 1 for each 25<br>000 $m^3$/d and part |

| | | | |
|---|---|---|---|
| | | | thereof of the total volume |

Note 1:

A supply zone is a geographically defined area within which water intended for human consumption comes from one or more sources and within which water quality may be considered as being approximately uniform.

Note 2:

The volumes are calculated as averages taken over a calendar year. A Member State may use the number of inhabitants in a supply zone instead of the volume of water to determine the minimum frequency, assuming a water consumption of 200 l/day/capita.

Note 3:

In the event of intermittent short-term supply the monitoring frequency of water distributed by tankers is to be decided by the Member State concerned.

Note 4:

For the different parameters in Annex I, a Member State may reduce the number of samples specified in the table if:

(a) the values of the results obtained from samples taken during a period of at least two successive years are constant and significantly better than the limits laid down in Annex I, and

(b) no factor is likely to cause a deterioration of the quality of the water.

The lowest frequency applied must not be less than 50 % of the number of samples specified in the table except in the particular case of note 6.

Note 5:

As far as possible, the number of samples should be distributed equally in time and location.

Note 6:

The frequency is to be decided by the Member State concerned.

TABLE B2 Minimum frequency of sampling and analysis for water put into bottles or containers intended for sale

| **Volume of water produced for offering for sale in bottles or containers each day[a] $m^3$** | | **Check monitoring number of samples per year** | **Audit monitoring number of samples per year** |
|---|---|---|---|
| ≤ 10 | | 1 | 1 |
| > 10 | ≤ 60 | 12 | 1 |
| > 60 | | 1 for each 5 $m^3$ and part thereof of the total volume | 1 for each 100 $m^3$ and part thereof of the total volume |

**a** The volumes are calculated as averages taken over a calendar year.

## ANNEX III

## SPECIFICATIONS FOR THE ANALYSIS OF PARAMETERS

Each Member State must ensure that any laboratory at which samples are analysed has a system of analytical quality control that is subject from time to time to checking by a person who is not under the control of the laboratory and who is approved by the competent authority for that purpose.

## 1. PARAMETERS FOR WHICH METHODS OF ANALYSIS ARE SPECIFIED

**[**[F1]The following principles for methods of microbiological parameters are given either for reference, whenever a CEN/ISO method is given, or for guidance, pending the possible future adoption by the Commission of further CEN/ISO international methods for those parameters. Member States may use alternative methods, providing the provisions of Article 7(5) are met.

Those measures on further CEN/ISO international methods, designed to amend non-essential elements of this Directive, *inter alia*, by supplementing it, shall be adopted in accordance with the regulatory procedure with scrutiny referred to in Article 12(3).**]**

Coliform bacteria and *Escherichia coli (E. coli)* (ISO 9308-1)

Enterococci (ISO 7899-2)

*Pseudomonas aeruginosa* (prEN ISO 12780)

Enumeration of culturable microorganisms — Colony count 22 °C (prEN ISO 6222)

Enumeration of culturable microorganisms — Colony count 37 °C (prEN ISO 6222)

*Clostridium perfringens* (including spores)

Membrane filtration followed by anaerobic incubation of the membrane on m-CP agar (Note 1) at 44 ± 1 °C for 21 ± 3 hours. Count opaque yellow colonies that turn pink or red after exposure to ammonium hydroxide vapours for 20 to 30 seconds.
Note 1:

The composition of m-CP agar is:

Basal medium

| | |
|---|---|
| Tryptose | 30 g |
| Yeast extract | 20 g |
| Sucrose | 5 g |
| L-cysteine hydrochloride | 1 g |
| $MgSO_4 \cdot 7H_2O$ | 0,1 g |
| Bromocresol purple | 40 mg |
| Agar | 15 g |
| Water | 1 000 ml |

Dissolve the ingredients of the basal medium, adjust pH to 7,6 and autoclave at 121 °C for 15 minutes. Allow the medium to cool and add:

| | |
|---|---|
| D-cycloserine | 400 mg |
| Polymyxine-B sulphate | 25 mg |
| Indoxyl-β-D-glucoside<br>to be dissolved in 8 ml sterile water before addition | 60 mg |
| Filter — sterilised 0,5 %<br>phenolphthalein diphosphate solution | 20 ml |
| Filter — sterilised 4,5 % $FeCl_3 \cdot 6H_2O$ | 2 ml |

## 2. PARAMETERS FOR WHICH PERFORMANCE CHARACTERISTICS ARE SPECIFIED

2.1. For the following parameters, the specified performance characteristics are that the method of analysis used must, as a minimum, be capable of measuring concentrations equal to the parametric value with a trueness, precision and limit of detection specified. Whatever the sensitivity of the method of analysis used, the result must be expressed using at least the same number of decimals as for the parametric value considered in Annex I, Parts B and C.

| **Parameters** | **Trueness % of parametric value(Note 1)** | **Precision % of parametric value(Note 2)** | **Limit of detection % of parametric value(Note 3)** | **Conditions** | **Notes** |
|---|---|---|---|---|---|
| Acrylamide | | | | To be controlled by product specification | |
| Aluminium | 10 | 10 | 10 | | |
| Ammonium | 10 | 10 | 10 | | |
| Antimony | 25 | 25 | 25 | | |
| Arsenic | 10 | 10 | 10 | | |
| Benzo(a)pyrene | 25 | 25 | 25 | | |
| Benzene | 25 | 25 | 25 | | |
| Boron | 10 | 10 | 10 | | |
| Bromate | 25 | 25 | 25 | | |
| Cadmium | 10 | 10 | 10 | | |
| Chloride | 10 | 10 | 10 | | |
| Chromium | 10 | 10 | 10 | | |
| Conductivity | 10 | 10 | 10 | | |
| Copper | 10 | 10 | 10 | | |
| Cyanide | 10 | 10 | 10 | | Note 4 |
| 1,2-dichloroethane | 25 | 25 | 10 | | |
| Epichlorohydrin | | | | To be controlled by product specification | |
| Fluoride | 10 | 10 | 10 | | |
| Iron | 10 | 10 | 10 | | |
| Lead | 10 | 10 | 10 | | |

| | | | | | |
|---|---|---|---|---|---|
| Manganese | 10 | 10 | 10 | | |
| Mercury | 20 | 10 | 20 | | |
| Nickel | 10 | 10 | 10 | | |
| Nitrate | 10 | 10 | 10 | | |
| Nitrite | 10 | 10 | 10 | | |
| Oxidisability | 25 | 25 | 10 | | Note 5 |
| Pesticides | 25 | 25 | 25 | | Note 6 |
| Polycyclic aromatic hydrocarbons | 25 | 25 | 25 | | Note 7 |
| Selenium | 10 | 10 | 10 | | |
| Sodium | 10 | 10 | 10 | | |
| Sulphate | 10 | 10 | 10 | | |
| Tetrachloroethene | 25 | 25 | 10 | | Note 8 |
| Trichloroethene | 25 | 25 | 10 | | Note 8 |
| Trihalomethanes — Total | 25 | 25 | 10 | | Note 7 |
| Vinyl chloride | | | | To be controlled by product specification | |

2.2. For hydrogen ion concentration the specified performance characterisatics are that the method of analysis used must be capable of measuring concentrations equal to the parametric value with a trueness of 0,2 pH unit and a precision of 0,2 pH unit.

| | |
|---|---|
| *Note 1*[a]: | Trueness is the systematic error and is the difference between the mean value of the large number of repeated measurements and the true value. |
| *Note 2*[a]: | Precision is the random error and is usually expressed as the standard deviation (within and between batch) of the spread of results about the mean. Acceptable precision is twice the relative standard deviation. |

**a** These terms are further defined in ISO 5725.

| | |
|---|---|
| *Note 3:* | Limit of detection is either:<br>— three times the relative within batch standard deviation of a natural sample containing a low concentration of the parameter, or |

| | |
|---|---|
| | — five times the relative within batch standard deviation of a blank sample. |
| *Note 4:* | The method should determine total cyanide in all forms. |
| *Note 5:* | Oxidation should be carried out for 10 minutes at 100 °C under acid conditions using permanganate. |
| *Note 6:* | The performance characteristics apply to each individual pesticide and will depend on the pesticide concerned. The limit of detection may not be achievable for all pesticides at present, but Member States should strive to achieve this standard. |
| *Note 7:* | The performance characteristics apply to the individual substances specified at 25 % of the parametric value in Annex I. |
| *Note 8:* | The performance characteristics apply to the individual substances specified at 50 % of the parametric value in Annex I. |

3. PARAMETERS FOR WHICH NO METHOD OF ANALYSIS IS SPECIFIED

Colour
Odour
Taste
Total organic carbon
Turbidity (Note 1)

| | |
|---|---|
| *Note 1:* | For turbidity monitoring in treated surface water the specified performance characteristics are that the method of analysis used must, as a minimum, be capable of measuring concentrations equal to the parametric value with a trueness of 25 %, precision of 25 % and a 25 % limit of detection. |

## ANNEX IV

## DEADLINES FOR TRANSPOSITION INTO NATIONAL LAW AND FOR APPLICATION

| **Directive 80/778/EEC** | **Directive 81/858/EEC** | **Act of Accession of Spain and Portugal** | **Directive 90/656/EEC** | **Act of Accession of Austria, Finland** | **Directive 91/692/EEC** |
|---|---|---|---|---|---|
| **Transposition: 17.7.1982**<br>**Application: 17.7.1985** | **(Adaptation to technical progress)**<br>**All** | **Spain: transposition 1.1.1986 application 1.1.1986**<br>**Portugal: transposition** | **for new** | **transposition 1.1.1986 application 1.1.1986** | |

| **Member States except Spain, Portugal and new *Länder* of Germany** | **accession of Greece)** | | ***Länder* of Germany** | **and SwedenAustria:transposition1.1.1995applicatio** | |
|---|---|---|---|---|---|
| Articles 1 to 14 | | | Application 31.12.1995 | | |
| Article 15 | Amended with effect from 1.1.1981 | Amended with effect from 1.1.1986 | | Amended with effect from 1.1.1995 | |
| Article 16 | | | | | |
| Article 17 | | | | | Article 17(a) inserted |
| Article 18 | | | | | |
| Article 19 | | Amended | Amended | | |
| Article 20 | | | | | |
| Article 21 | | | | | |

ANNEX V

CORRELATION TABLE

| **This Directive** | **Directive 80/778/EEC** |
|---|---|
| Article 1(1) | Article 1(1) |
| Article 1(2) | — |
| Article 2(1) (a) and (b) | Article 2 |
| Article 2(2) | — |
| Article 3(1) (a) and (b) | Article 4(1) |
| Article 3(2) (a) and (b) | — |
| Article 3(3) | — |
| Article 4(1) | Article 7(6) |
| Article 4(2) | Article 11 |
| Article 5(1) | Article 7(1) |
| Article 5(2) first sentence | Article 7(3) |

| | |
|---|---|
| Article 5(2) second sentence | — |
| Article 5(3) | — |
| Article 6(1) | Article 12(2) |
| Article 6(2) to (3) | — |
| Article 7(1) | Article 12(1) |
| Article 7(2) | — |
| Article 7(3) | Article 12(3) |
| Article 7(4) | — |
| Article 7(5) | Article 12(5) |
| Article 7(6) | — |
| Article 8 | — |
| Article 9(1) | Article 9(1) and Article 10(1) |
| Article 9(2) to (6) | — |
| Article 9(7) | Article 9(2) and Article 10(3) |
| Article 9(8) | — |
| Article 10 | Article 8 |
| Article 11(1) | — |
| Article 11(2) | Article 13 |
| Article 12(1) | Article 14 |
| Article 12(2) and (3) | Article 15 |
| Article 13(1) | — |
| Article 13(2) to (5) | Article 17(a) (inserted by Directive 91/692/EEC) |
| Article 14 | Article 19 |
| Article 15 | Article 20 |
| Article 16 | — |
| Article 17 | Article 18 |
| Article 18 | — |
| Article 19 | Article 21 |

(**1**) To be added following the outcome of the study currently being carried out.