# COUNCIL DIRECTIVE
# of 18 July 1978
# on the quality of fresh waters needing protection or improvement in order to support fish life
# (78/659/EEC)

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| Act concerning the Conditions of Accession and Adjustments to the Treaties – Accession to the European Communities of the Kingdom of Spain and the Portuguese Republic (185I) | L 302 | 218 | 15. 11. 1985 |

# COUNCIL DIRECTIVE
## of 18 July 1978
## on the quality of fresh waters needing protection or improvement in order to support fish life
## (78/659/EEC)

THE COUNCIL OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Economic Community, and in particular Articles 100 and 235 thereof,

Having regard to the proposal from the Commission,

Having regard to the opinion of the European Parliament [1],

Having regard to the opinion of the Economic and Social Committee [2],

Whereas the protection and improvement of the environment necessitates concrete measures to protect waters against pollution, including waters capable of supporting freshwater fish;

Whereas it is necessary from the ecological and economic viewpoint to safeguard fish populations from various harmful consequences, resulting from the discharge of pollutant substances into the waters, such as, in particular, the reduction in number of fish belonging to a certain species and even in some cases the disappearance of a number of these species;

Whereas the programmes of action of the European Communities on the environment of 1973 [3] and 1977 [4] provide that quality objectives are to be jointly drawn up fixing the various requirements which an environment must meet, inter alia the definition of parameters for water, including waters capable of supporting freshwater fish;

Whereas differences between the provisions already in force or in preparation in the various Member States as regards the quality of waters capable of supporting the life of freshwater fish may create unequal conditions of competition and thus directly affect the functioning of the common market; whereas laws in the field should be approximated as provided for by Article 100 of the Treaty;

Whereas it is necessary to couple this approximation of laws with Community action aiming to achieve, by means of wider-ranging provisions, one of the Community's objectives in the field of environmental protection and the improvement of the quality of life; whereas certain specific provisions must be laid down in this connection; whereas, since the specific powers of action required to this end have not been provided for in the Treaty, it is necessary to invoke Article 235 thereof;

Whereas, in order to attain the objectives of the Directive, the Member States will have to designate the waters to which it will apply and will have to set limit values corresponding to certain parameters; whereas action will be taken to ensure that the waters so designated will conform to these values within five years of this designation;

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(1) OJ No C 30, 7. 2. 1977, p. 37.
(2) OJ No C 77, 30. 3. 1977, p. 2.
(3) OJ No C 112, 20. 12. 1973, p. 3.
(4) OJ No C 139, 13. 6. 1977, p. 3.

Whereas provision should be made that waters capable of supporting freshwater fish will, under certain conditions, be deemed to conform to the relevant parametric values even if a certain percentage of samples taken does not comply with the limits specified in the Annex;

Whereas to ensure that the quality of waters capable of supporting freshwater fish is checked, a minimum number of samples should be taken and the measurements relating to parameters set out in the Annex should be carried out; whereas such sampling may be reduced or discontinued in the light of the quality of the water;

Whereas the Member States are unable to control certain natural circumstances and it is therefore necessary to provide for the possibility of derogating from this Directive in certain cases;

Whereas technical and scientific progress may make necessary the rapid adaptation of certain of the requirements laid down in the Annexes to this Directive; whereas, in order to facilitate the introduction of the measures required for this purpose, a procedure should be laid down whereby close cooperation would be established between the Member States and the Commission within a Committee on Adaptation to Technical and Scientific Progress,

HAS ADOPTED THIS DIRECTIVE:

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*Article 1*

1. This Directive concerns the quality of fresh waters and applies to those waters designated by the Member States as needing protection or improvement in order to support fish life.

2. This Directive shall not apply to waters in natural or artificial fish ponds used for intensive fish-farming.

3. The aim of this Directive is to protect or improve the quality of those running or standing fresh waters which support or which, if pollution were reduced or eliminated, would become capable of supporting fish belonging to:

— indigenous species offering a natural diversity, or

— species the presence of which is judged desirable for water management purposes by the competent authorities of the Member States.

4. For the purposes of this Directive:

— salmonid waters shall mean waters which support or become capable of supporting fish belonging to species such as salmon (Salmo salar), trout (Salmo trutta), grayling (Thymallus thymallus) and whitefish (Coregonus),

— cyprinid waters shall mean waters which support or become capable of supporting fish belongingto the cyprinids (Cyprinidae), or other species such as pike (Esox lucius), perch (Perca fluviatilis) and eel (Anguilla anguilla).

*Article 2*

1. The physical and chemical parameters applicable to the waters designated by the Member States are listed in Annex I.

2. For the purposes of applying these parameters, waters are divided into salmonid waters and cyprinid waters.

*Article 3*

1. Member States shall, for the designated waters, set values for the parameters listed in Annex I, in so far as values are listed in column G or in column I. They shall comply with the comments contained in each of these two columns.

2. Member States shall not set values less stringent than those listed in column I of Annex I and shall endeavour to respect the values in column G taking into account the principle set out in Article 8.

*Article 4*

1. Member States shall, initially within a two year period following the notification of this Directive, designate salmonid waters and cyprinid waters.

2. Member States may subsequently make additional designations.

3. Member States may revise the designation of certain waters owing to factors unforeseen at the time of designation, taking into account the principle set out in Article 8.

*Article 5*

Member States shall establish programmes in order to reduce pollution and to ensure that designated waters conform within five years following designation in accordance with Article 4 to both the values set by the Member States in accordance with Article 3 and the comments contained in columns G and I of Annex I.

*Article 6*

1. For the purposes of implementing Article 5, the designated waters shall be deemed to conform to the provisions of this Directive if samples of such waters, taken at the minimum frequency specified in Annex I at the same sampling point and over a period of 12 months, show that they conform to both the valuesset by the Member States in accordance with Article 3 and to the comments contained in columns G and I of Annex I, in the case of:

— 95 % of the samples for the parameters: pH, $BOD_5$, non-ionized ammonia, total ammonium nitrites, total residual chlorine, total zinc, and dissolved copper. When the sampling frequency is lower than one sample per month, both the abovementioned values and comments shall be respected for all the samples,

— the percentages listed in Annex I for the parameters: temperature and dissolved oxygen,

— the average concentration set for the parameter: suspended solids.

2. Instances in which the values set by Member States in accordance with Article 3 or the comments contained in columns G and I of Annex I are not respected shall not be taken into consideration in the calculanon of the percentages provided for in paragraph 1 when they are the result of floods or other natural disasters.

*Article 7*

1. The competent authorities in the Member States shall carry out sampling operations, the minimum frequency of which is laid down in Annex I.

2. Where the competent authority records that the quality of designated waters is appreciably higher than that which would result from the application of the values set in accordance with Article 3 and the comments contained in columns G and I of Annex I, the frequency of the sampling may be reduced. Where there is no pollution or no risk of deterioration in the quality of the waters, the competent authority concerned may decide that no sampling is necessary.

3. If sampling shows that a value set by a Member State in accordance with Article 3 or a comment contained in either of columns G or I of Annex I is not respected, the Member State shall establish whether this is the result of chance, a natural phenomenon or pollution and shall adopt appropriate measures.

4. The exact sampling point, the distance from this point to the nearest point where pollutants are discharged and the depth at which the samples are to be taken shall be fixed by the competent authority of each Member State on the basis of local environmental conditions in particular.

5. Certain reference methods of analysis for the parameters concerned are set out in Annex I. Laboratories which employ other methods shall ensure float the results obtained are equivalent or comparable to those specified in Annex I.

*Article 8*

Implementation of the measures taken pursuant to this Directive may on no account lead, either directly or indirectly, to increased pollution of fresh water.

*Article 9*

Member States may at any time set more stringent values for designated waters than those laid down in this Directive. They may also lay down provisions relating to other parameters than those provided forin this Directive.

*Article 10*

When fresh waters cross or form national frontiers between Member States and when one of these States considers designating these waters, these States shall consult each other in order to determine the stretches of such waters to which the Directive might apply and the conseauences to be drawn from the common quality objectives; these consequences shall be determined, after formal consultations, by each State concerned. The Commission may participate in these deliberations.

*Article 11*

The Member States may derogate from this Directive:

(a) in the case of certain parameters marked (0) in Annex I, because of exceptional weather or special geographical conditions;

(b) when designated waters undergo natural enrichment in certain substances, so that the values set out in Annex I are not respected.

Natural enrichment means the process whereby, without human intervention, a given body of water receives from the soil certain substances contained therein.

*Article 12*

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Such amendments as are necessary for adapting to technical and scientific progress:

— the G values for the parameters, and

— the methods of analysis,

contained in Annex I shall be adopted in accordance with the procedure laid down in Article 14.

*Article 13*

1. A Committee on Adaptation to Technical and Scientific Progress (hereinafter called 'the Committee'), consisting of representatives of Member States and chaired by a Commission representative, is hereby set up for the purpose laid down in Article 12.

2. The Committee shall draw up its rules of procedure.

*Article 14*

1. Where the procedure laid down in this Article is to be followed, matters shall be referred to the Committee by its chairman, either on his own initiative or at the request of the representative of a Member State.

2. The Commission representative shall submit to the Committee a draft of the measures to be adopted. The Committee shall deliver its opinion on the draft within a time limit set by the chairman having regard to the urgency of the matter. It shall act by a majority of 54 votes, the votes of the Member States being weighted as provided for in Article 148 (2) of the Treaty. The chairman shall not vote.

185 I

3.(a) The Commission shall adopt the measures envisaged where they are in accordance with the opinion of the Committee.

(b) Where the measures envisaged are not in accordance with the opinion of the Committee, or if no opinion is adopted, the Commission shall without delay submit a proposal to the Council concerning the measures to be adopted. The Council shall act by a qualified majority.

(c) If, within three months of the proposals being submitted to it, the Council has not acted, the proposed measures shall be adopted by the Commission.

*Article 15*

For the purposes of applying this Directive, Member States shall provide the Commission with information concerning:

— the waters designated in accordance with Article 4 (1) and (2), in summary form,

— the revision of the designation of certain Waters inaccordance with Article 4 (3),

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— the provisions laid down in order to establish new parameters in accordance with Article 9,

— the application of the derogations from the values listed in column I in Annex I.

More generally, Member States shall provide the Commission, on a reasoned request from the latter, with any information necessary for the application of this Directive.

*Article 16*

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At intervals of three years Member States shall send information to the Commission on the implementation of this Directive, in the form of a sectoral report which shall also cover other pertinent Community Directives. The report shall be drawn up on the basis other of a questionnaire or outline drafted by the Commission in accordance with the procedure laid down in Article 6 of Directive 91/692/EEC [5]. The questionnaire or outline shall be sent to the Member States six months before the start of the period covered by the report. The report shall be made to the Commission within nine months of the end of the three-year period covered by it.

The first report shall cover the period 1995 to 1997 inclusive.

The Commission shall publish a Community report on the implementation of the Directive within nine months of receiving the reports from the Member States.

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*Article 17*

1. Member States shall bring into force the laws, regulations and administrative provisions necessary to comply with this Directive within two years of its notification. They shall forthwith inform the Commission thereof.

2. Member States shall communicate to the Commission the texts of the main provisions of national law which they adopt in the field governed by this Directive.

*Article 18*

This Directive is addressed to the Member States.

[5] OJ No L 377, 31. 12. 1991, p. 48.

*ANNEX I*

**LIST OF PARAMETERS**

| Parameter | Salmonid waters | | Cyprinid waters | | Methods of analysis or inspection | Minimum sampling and measuring frequency | Observations |
|---|---|---|---|---|---|---|---|
| | G | I | G | I | | | |
| 1. Temperature (°C) | 1. Temperature measured downstream of a point of thermal discharge (at the edge of the mixing zone) must not exceed the unaffected temperature by more than: | | | | Thermometry | Weekly, both upstream and downstream of the point of thermal discharge | Over-sudden variations in temperature shall be avoided |
| | 1.5°C | | | 3°C | | | |
| | Derogations limited in geographical scope may be decided by Member States in particular conditions if the competent authority can prove that there are no harmful consequences for the balanced development of the fish population | | | | | | |
| | 2. Thermal discharges must not cause the temperature downstream of the point of thermal discharge (at the edge of the mixting zone) to exceed the following: | | | | | | |
| | 21.5 (0)<br>10 (0) | | | 28 (0)<br>10 (0) | | | |
| | The 10°C temperature limit applies only to breeding periods of species which need cold water for reproduction and only to waters which may contain such species | | | | | | |
| | Temperature limits may, however, be exceeded for 2 % of the time. | | | | | | |

| Parameter | Salmonid waters | | Cyprinid waters | | Methods of analysis or inspection | Minimum sampling and measuring frequency | Observations |
|---|---|---|---|---|---|---|---|
| | G | I | G | I | | | |
| 2 Dissolved oxygen (mg/l $O_2$) | 50 % ≥ 9<br>100 % ≥ 7 | 50 % ≥ 9<br>When the oxygen concentration falls below 6 mg/l, Member States shall implement the provisions of Article 7 (3). The comptetent authority must prove that this situation will have no harmful consequences for the balanced development of the fish population | 50 % ≥ 8<br>100 % ≥ 7 | 50 % ≥ 7<br>When the oxygen concentration falls below 4 mg/l, Member States shall implement the provisions of Article 7 (3). The comptetent authority must prove that this situation will have no harmful consequences for the balanced development of the fish population | Winkler's method or specific electrodes (eletro-chemical method) | Monthly, minimum one sample representative of low oxygen conditions of the day of sampling<br><br>However, where major daily variations are suspected, a minimum of two samples in one day shall be taken | |
| 3. pH | | 6-9 (0) (1) | | 6-9 (0) (1) | Electrometry calibration by means of two solutions with known pH values, preferably on either side of, and blose to the pH being measured | Monthly | |
| 4. Suspended solids (mg/l) | ≤ 25 (0) | | ≤ 25 (0) | | Filtration through a 0.45 μm filtering membrane, or centrifugation (five minutes minimum, average acceleration of 2 800 to 3 200 g) drying at 105 °C and weighing | | The values chown are average concentrations and do not apply to suspended solids with harmful chemical properties<br><br>Floods are liable to cause particularly high concentrations |

| Parameter | Salmonid waters | | Cyprinid waters | | Methods of analysis or inspection | Minimum sampling and measuring frequency | Observations |
|---|---|---|---|---|---|---|---|
| | G | I | G | I | | | |
| 5. $BOD_5$ (mg/l $O_2$) | $\leq 3$ | | $\leq 6$ | | Determination of $O_2$ by the Winkler method before and after five days incubation in complete darkness at 20 ± 1°C. (nitrification should not be inhibited) | | |
| 6. Total phosphorus (mg/l P) | | | | | Molecular absorption spectrophotometry | | In the case of lakes of average depth between 18 and 300 m, the following formula could be applied:<br>$L \leq 10\frac{\overline{Z}}{Tw}(1 + \sqrt{Tw})$<br>where:<br>L = loading expressed as mg P per square metre lake surface in one year<br>$\overline{Z}$ = mean depth of lake in metres<br>Tw = theoretical renewal time of lake water in years |

| Parameter | Salmonid waters | | Cyprinid waters | | Methods of analysis or inspection | Minimum sampling and measuring frequency | Observations |
|---|---|---|---|---|---|---|---|
| | G | I | G | I | | | |
| | | | | | | | In other cases limit values of 0.2 mg/l for salmonid and of 0.4 mg/l for cyprinid waters, expressed as $PO_4$, may be regarded as indicative inorder to reduce eutrophication |
| 7. Nitrites (mg/l $NO_2$) | $\leq 0.01$ | | $\leq 0.03$ | | Molecular absorption spectrophotometry | | |
| 8. Phenolic compounds (mg/l $C_6H_5OH$) | | ([2]) | | ([2]) | By taste | | An examination by taste shall be made only where the presence of phenolic compounds is presumed |
| 9. Petroleum hydrocarbons | | ([3]) | | ([3]) | Visual<br>By taste | Monthly | A visual examination shall be made regularly once a month, with an examination by taste only where the presence of hydrocrbons is presumed |

| Parameter | Salmonid waters | | Cyprinid waters | | Methods of analysis or inspection | Minimum sampling and measuring frequency | Observations |
|---|---|---|---|---|---|---|---|
| | G | I | G | I | | | |
| 10. Non-ionized ammonia (mg/l $NH_3$) | $\leq 0.005$ | $\leq 0.025$ | $\leq 0.005$ | $\leq 0.025$ | Molecular absorption spectrophotometry using indophenol blue or Nessler's method associated with pH and temperature determination | Monthly | Values for non-ionized ammonia may be exceeded in the form of minor peaks in the daytime |
| | In order to diminish the risk of toxicity due to non-ionized ammonia, of oxygen consumption due to nitrification and of eutrophication, the concentrations of total ammonium should not exceed the following: | | | | | | |
| 11. Total ammonium (mg/l $NH_4$) | $\leq 0.04$ | $\leq 1$ ([4]) | $\leq 0.2$ | $\leq 1$ ([4]) | | | |
| 12. Total residual chlorine (mg/l HOCl) | | $\leq 0.005$ | | $\leq 0.005$ | DPD-method (dietyl-p-phenylenediamene) | Monthly | The I-values correspond to pH = 6 Higher concentrations of total chlorine can be accepted if the pH is higher |
| 13. Total zinc (mg/l Zn) | | $\leq 0.3$ | | $\leq 1.0$ | Atomic absorption spectrometry | Monthly | The I-values correspond to a water hardness of 100 mg/l $CacO_3$. For hardness levels between 10 and 500 mg/l corresponding limit values can be found in Annex II |

| Parameter | Salmonid waters | | Cyprinid waters | | Methods of analysis or inspection | Minimum sampling and measuring frequency | Observations |
|---|---|---|---|---|---|---|---|
| | G | I | G | I | | | |
| 14. Dissolved copper (mg/l Cu) | $\leq 0.4$ | | $\leq 0.04$ | | Atomic absorption spectrometry | | The G-values correspond to a water hardness of 100 mg/l $CacO_3$. For hardness levels between 10 and 300 mg/l corresponding limit values can be found in Annex II |

([1]) Artificial pH variations with respect to the unaffected values shall not exceed ± 0.5 pH unit within the limits falling between 6.0 and 9.0 provided that these variations do not increase the harmfulness of other substances present in the water.

([2]) Phenolic compounds must not be present in such concentrations that they adversely affect fish flavour.

([3]) Petroleum products must not be present in water in such quantities that they:

— form a visible film on the surface of the water or form coatings on the beds of water-courses and lakes,

— impart a detectable 'hydrocarbon' taste to fish,

— produce harmful effects in fish.

([4]) In particular geographical or climatic conditions and particularly in cases of law water temperature and of reduced nitrification or where the competent authority can prove that there are no harmful consequences for the balanced development of the fish population, Member States may fix values higher than 1 mg/l.

*General observation:*

It should be noted that the parametric values listed in this Annex assume that the other parameters, whether mentioned in this Annex or not, are favourable. This implies, in particular, that the concentrations of other harmful substrances are very low.

Where two or more harmful substances are present in mixture, joint effects (additive, synergic or antagonistic effects) may be significant.

G = guide.

I = mandatory.

(0) = derogations are possible in accordance with Article 11.

*ANNEX II*

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**PARTICULARS REGARDING TOTAL ZINC AND DISSOLVED COPPER**

Total zinc

(see Annex I, No 13, 'Observations' column)

Zinc concentrations (mg/l Zn) for different water hardness values between 10 and 500 mg/l $CaCO_3$:

| | Water hardness (mg/l $CaCO_3$) | | | |
|---|---|---|---|---|
| | 10 | 50 | 50 | 500 |
| Salmonid waters (mg/l Zn) | 0.03 | 0.2 | 0.3 | 0.5 |
| Cyprinid waters (mg/l Zn) | 0.3 | 0.7 | 1.0 | 2.0 |

Dissolved copper

See annex I, No 14, 'Observations' column)

Dissolved copper concentrations (mg/l Cu) for different water hardness values between 10 and 300 mg/l $CaCO_3$:

| | Water hardness (mg/l $CaCO_3$) | | | |
|---|---|---|---|---|
| | 10 | 50 | 50 | 300 |
| mg/l Cu | 0.005 ([1]) | 0.022 | 0.04 | 0.112 |

([1]) The presence of fish in waters containing higher concentrations of copper may indicate a predominance of dissolved organo-cupric complexes.