

ANNEX I

GROUNDWATER QUALITY STANDARDS

- For the purposes of assessing groundwater chemical status in accordance with Article 4, the following groundwater quality standards will be the quality standards referred to in Table 2.3.2 in Annex V to Directive 2000/60/EC and established in accordance with Article 17 of that Directive.

Pollutant	Quality standards
Nitrates	50 mg/l
Active substances in pesticides, including their relevant metabolites, degradation and reaction products ^a	0,1 µg/l 0,5 µg/l (total) ^b
a	'Pesticides' means plant protection products and biocidal products as defined in Article 2 of Directive 91/414/EEC and in Article 2 of Directive 98/8/EC, respectively.
b	'Total' means the sum of all individual pesticides detected and quantified in the monitoring procedure, including their relevant metabolites, degradation and reaction products.

- The results of the application of the quality standards for pesticides in the manner specified for the purposes of this Directive will be without prejudice to the results of the risk assessment procedures required by Directive 91/414/EEC or Directive 98/8/EC.
- Where, for a given body of groundwater, it is considered that the groundwater quality standards could result in failure to achieve the environmental objectives specified in Article 4 of Directive 2000/60/EC for associated bodies of surface water, or in any significant diminution of the ecological or chemical quality of such bodies, or in any significant damage to terrestrial ecosystems which depend directly on the body of groundwater, more stringent threshold values will be established in accordance with Article 3 and Annex II to this Directive. Programmes and measures required in relation to such a threshold value will also apply to activities falling within the scope of Directive 91/676/EEC.

ANNEX II

THRESHOLD VALUES FOR GROUNDWATER
POLLUTANTS AND INDICATORS OF POLLUTION

Part A

**Guidelines for the establishment of threshold values
by Member States in accordance with Article 3**

Member States will establish threshold values for all pollutants and indicators of pollution which, pursuant to the characterisation performed in accordance with Article 5 of Directive 2000/60/EC, characterise bodies or groups of bodies of groundwater as being at risk of failing to achieve good groundwater chemical status.

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Threshold values will be established in such a way that, should the monitoring results at a representative monitoring point exceed the thresholds, this will indicate a risk that one or more of the conditions for good groundwater chemical status referred to in Article 4(2)(c)(ii), (iii) and (iv) are not being met.

When establishing threshold values, Member States will consider the following guidelines:

- 1) the determination of threshold values should be based on:
 - (a) the extent of interactions between groundwater and associated aquatic and dependent terrestrial ecosystems;
 - (b) the interference with actual or potential legitimate uses or functions of groundwater;
 - (c) all pollutants which characterise bodies of groundwater as being at risk, taking into account the minimum list set out in part B;
 - (d) hydro-geological characteristics including information on background levels and water balance;
- 2) the determination of threshold values should also take account of the origins of the pollutants, their possible natural occurrence, their toxicology and dispersion tendency, their persistence and their bioaccumulation potential;
- 3) ^[F] wherever elevated background levels of substances or ions or their indicators occur due to natural hydro-geological reasons, those background levels in the relevant body of groundwater shall be taken into account when establishing threshold values. When determining background levels, the following principles should be taken into account:
 - (a) The determination of background levels should be based on the characterisation of groundwater bodies in accordance with Annex II to Directive 2000/60/EC and on the results of groundwater monitoring in accordance with Annex V to that Directive. The monitoring strategy and interpretation of the data should take account of the fact that flow conditions and groundwater chemistry vary laterally and vertically;
 - (b) Where only limited groundwater monitoring data are available, more data should be gathered and in the meantime background levels should be determined based on those limited monitoring data, where appropriate by a simplified approach using a subset of samples for which indicators show no influence of human activity. Information on geochemical transfers and processes should also be taken account of, where available;
 - (c) Where insufficient groundwater monitoring data are available and the information on geochemical transfers and processes is poor, more data and information should be gathered and in the meantime background levels should be estimated, where appropriate based on statistical reference results for the same type of aquifers in other areas having sufficient monitoring data.]
- 4) the determination of threshold values should be supported by a control mechanism for the data collected, based on an evaluation of data quality, analytical considerations, and background levels for substances which may occur both naturally and as a result of human activities.

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Textual Amendments

- F1** Substituted by [Commission Directive 2014/80/EU of 20 June 2014 amending Annex II to Directive 2006/118/EC of the European Parliament and of the Council on the protection of groundwater against pollution and deterioration \(Text with EEA relevance\)](#).

Part B

Minimum list of pollutants and their indicators for which Member States have to consider establishing threshold values in accordance with Article 3

1. Substances or ions or indicators which may occur both naturally and/or as a result of human activities
 - Arsenic
 - Cadmium
 - Lead
 - Mercury
 - Ammonium
 - Chloride
 - Sulphate
 - [^{F2}Nitrites
 - Phosphorus (total)/Phosphates]⁽¹⁾

Textual Amendments

- F2** Inserted by [Commission Directive 2014/80/EU of 20 June 2014 amending Annex II to Directive 2006/118/EC of the European Parliament and of the Council on the protection of groundwater against pollution and deterioration \(Text with EEA relevance\)](#).

2. Man-made synthetic substances
 - Trichloroethylene
 - Tetrachloroethylene
3. Parameters indicative of saline or other intrusions⁽²⁾
 - Conductivity

[^{F1}Part C

Information to be provided by Member States with regard to the pollutants and their indicators for which threshold values have been established

Member States shall include in the river basin management plans to be submitted in accordance with Article 13 of Directive 2000/60/EC information on the way the procedure set out in Part A of this Annex has been followed.

In particular, Member States shall provide:

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- (a) information on each of the bodies or groups of bodies of groundwater characterised as being at risk, including the following:
 - (i) the size of the bodies;
 - (ii) each pollutant or indicator of pollution which characterises bodies of groundwater as being at risk;
 - (iii) the environmental quality objectives to which the risk is related, including the actual or potential legitimate uses or functions of the groundwater body, and the relationship between the bodies of groundwater and the associated surface waters and directly dependent terrestrial ecosystems;
 - (iv) in the case of naturally-occurring substances, the natural background levels in the bodies of groundwater;
 - (v) information on the exceedances where threshold values are exceeded;
- (b) the threshold values, whether they apply at the national level, at the level of the river basin district or the part of the international river basin district falling within the territory of the Member State, or at the level of a body or a group of bodies of groundwater;
- (c) the relationship between the threshold values and each of the following:
 - (i) in the case of naturally-occurring substances, the background levels;
 - (ii) associated surface waters and directly dependent terrestrial ecosystems;
 - (iii) the environmental quality objectives and other standards for water protection that exist at national, Union or international level;
 - (iv) any relevant information concerning the toxicology, eco-toxicology, persistence, bioaccumulation potential, and dispersion tendency of the pollutants;
- (d) the methodology for determining background levels based on the principles set out in point 3 of Part A;
- (e) the reasons for not having established threshold values for any of the pollutants and indicators identified in Part B;
- (f) key elements of the groundwater chemical status assessment, including the level, method and period of aggregation of monitoring results, the definition of the acceptable extent of exceedance, and the method for calculating it, in accordance with Article 4(2)(c)(i) and point 3 of Annex III.

Where any of the data referred to in points (a) to (f) are not included in the river basin management plans, Member States shall provide the reasons for this in those plans.]

ANNEX III

ASSESSMENT OF GROUNDWATER CHEMICAL STATUS

1. The assessment procedure for determining the chemical status of a body or a group of bodies of groundwater will be carried out in relation to all bodies or groups of bodies

- of groundwater characterised as being at risk and in relation to each of the pollutants which contribute to the body or group of bodies of groundwater being so characterised.
2. In undertaking any investigations referred to in Article 4(2)(c), Member States will take into account:
 - (a) the information collected as part of the characterisation to be carried out in accordance with Article 5 of Directive 2000/60/EC and with Sections 2.1, 2.2 and 2.3 of Annex II thereto;
 - (b) the results of the groundwater monitoring network obtained in accordance with Section 2.4 of Annex V to Directive 2000/60/EC; and
 - (c) any other relevant information including a comparison of the annual arithmetic mean concentration of the relevant pollutants at a monitoring point with the groundwater quality standards set out in Annex I and the threshold values set by Member States in accordance with Article 3 and Annex II.
 3. For the purposes of investigating whether the conditions for good groundwater chemical status referred to in Article 4(2)(c)(i) and (iv) are met, Member States will, where relevant and necessary, and on the basis of appropriate aggregations of the monitoring results, supported where necessary by concentration estimations based on a conceptual model of the body or group of bodies of groundwater, estimate the extent of the body of groundwater having an annual arithmetic mean concentration of a pollutant higher than a groundwater quality standard or a threshold value.
 4. For the purposes of investigating whether the conditions for good groundwater chemical status referred to in Article 4(2)(c)(ii) and (iii) are met, Member States will, where relevant and necessary, and on the basis of relevant monitoring results and of a suitable conceptual model of the body of groundwater, assess:
 - (a) the impact of the pollutants in the body of groundwater;
 - (b) the amounts and the concentrations of the pollutants being, or likely to be, transferred from the body of groundwater to the associated surface waters or directly dependent terrestrial ecosystems;
 - (c) the likely impact of the amounts and concentrations of the pollutants transferred to the associated surface waters and directly dependent terrestrial ecosystems;
 - (d) the extent of any saline or other intrusions into the body of groundwater; and
 - (e) the risk from pollutants in the body of groundwater to the quality of water abstracted, or intended to be abstracted, from the body of groundwater for human consumption.
 5. Member States will present the groundwater chemical status of a body or a group of bodies of groundwater on maps in accordance with Sections 2.4.5 and 2.5 of Annex V to Directive 2000/60/EC. In addition, Member States will indicate on these maps all monitoring points where groundwater quality standards and/or threshold values are exceeded, where relevant and feasible.

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ANNEX IV

IDENTIFICATION AND REVERSAL OF SIGNIFICANT AND SUSTAINED UPWARD TRENDS

Part A

Identification of significant and sustained upward trends

Member States will identify significant and sustained upward trends in all bodies or groups of bodies of groundwater that are characterised as being at risk in accordance with Annex II to Directive 2000/60/EC, taking into account the following requirements:

- 1) in accordance with Section 2.4 of Annex V to Directive 2000/60/EC, the monitoring programme will be so designed as to detect significant and sustained upward trends in concentrations of the pollutants identified pursuant to Article 3 of this Directive;
- 2) the procedure for the identification of significant and sustained upward trends will be based on the following elements:
 - (a) monitoring frequencies and monitoring locations will be selected such as are sufficient to:
 - (i) provide the information necessary to ensure that such upward trends can be distinguished from natural variation with an adequate level of confidence and precision;
 - (ii) enable such upward trends to be identified in sufficient time to allow measures to be implemented in order to prevent, or at least mitigate as far as practicable, environmentally significant detrimental changes in groundwater quality. This identification will be carried out for the first time by 2009, if possible, and will take into account existing data, in the context of the report on trend identification within the first river basin management plan referred to in Article 13 of Directive 2000/60/EC, and at least every six years thereafter;
 - (iii) take into account the physical and chemical temporal characteristics of the body of groundwater, including groundwater flow conditions and recharge rates and percolation time through soil or subsoil;
 - (b) the methods of monitoring and analysis used will conform to international quality control principles, including, if relevant, CEN or national standardised methods, to ensure equivalent scientific quality and comparability of the data provided;
 - (c) the assessment will be based on a statistical method, such as regression analysis, for trend analysis in time series of individual monitoring points;
 - (d) in order to avoid bias in trend identification, all measurements below the quantification limit will be set to half of the value of the highest quantification limit occurring in time series, except for total pesticides;

- 3) the identification of significant and sustained upward trends in the concentrations of substances which occur both naturally and as a result of human activities will consider the baseline levels and, where such data are available, the data collected before the start of the monitoring programme in order to report on trend identification within the first river basin management plan referred to in Article 13 of Directive 2000/60/EC.

Part B

Starting points for trend reversals

Member States will reverse identified significant and sustained upward trends, in accordance with Article 5, taking into account the following requirements:

- 1) the starting point for implementing measures to reverse significant and sustained upward trends will be when the concentration of the pollutant reaches 75 % of the parametric values of the groundwater quality standards set out in Annex I and of the threshold values established pursuant to Article 3, unless:
 - (a) an earlier starting point is required to enable trend reversal measures to prevent most cost-effectively, or at least mitigate as far as possible, any environmentally significant detrimental changes in groundwater quality;
 - (b) a different starting point is justified where the detection limit does not allow for establishing the presence of a trend at 75 % of the parametric values; or
 - (c) the rate of increase and the reversibility of the trend are such that a later starting point for trend reversal measures would still enable such measures to prevent most cost-effectively, or at least mitigate as far as possible, any environmentally significant detrimental changes in groundwater quality. Such later starting point may not lead to any delay in achieving the deadline for the environmental objectives.

For activities falling within the scope of Directive 91/676/EEC, the starting point for implementing measures to reverse significant and sustained upward trends will be established in accordance with that Directive and with Directive 2000/60/EC and, in particular, adhering to environmental objectives for water protection as set out in Article 4 of Directive 2000/60/EC;

- 2) once a starting point has been established for a body of groundwater characterised as being at risk in accordance with Section 2.4.4 of Annex V to Directive 2000/60/EC and pursuant to point 1 above, it will not be changed during the six-year cycle of the river basin management plan required in accordance with Article 13 of Directive 2000/60/EC;
- 3) trend reversals will be demonstrated, taking into account relevant monitoring provisions contained in Part A, point 2.

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- (1) [^{F2}Member States may decide to establish threshold values either for phosphorus (total) or for phosphates.]
- (2) With regard to saline concentrations resulting from human activities, Member States may decide to establish threshold values either for sulphate and chloride or for conductivity.

Textual Amendments

- F2** Inserted by [Commission Directive 2014/80/EU of 20 June 2014 amending Annex II to Directive 2006/118/EC of the European Parliament and of the Council on the protection of groundwater against pollution and deterioration \(Text with EEA relevance\)](#).