

## Groundwater quantitative and chemical status

The WFD requires Member States to designate separate groundwater bodies and ensure that each one achieves 'good chemical and quantitative status'. To meet the aim of good chemical status, hazardous substances should be prevented from entering groundwater, and the entry of all other pollutants (e.g. nitrates) should be limited.

Good quantitative status can be achieved by ensuring that the available groundwater resource is not reduced by the long-term annual average rate of abstraction. In addition, impacts on surface water linked with groundwater or groundwater-dependent terrestrial ecosystems should be avoided, as should saline intrusions.

Further information is provided in the chapter 4 and 5 of the EEA report [European waters – assessment of status and pressures 2018](#), and section 3.4 Quantitative status of groundwater and exemptions and section 3.5 Chemical status of groundwater and exemptions of the [WFD 2016 reporting guidance](#).

*Caution is advised when comparing Member States and when comparing the first and second RBMPs, as the results are affected by the methods Member States have used to collect data and often cannot be compared directly.*

The following dashboards are available (2018/07/17)

### Groundwater bodies: quantitative status

- Quantitative status - tables [overview table](#) and [by geological formation](#)
- Quantitative status - charts [by geological formation](#); [country comparison](#); and [by country and geological formation](#)
- Quantitative status - maps [by country](#); [by RBD](#); and [by country and RBD](#)
- Quantitative status assessment confidence [overview table](#)
- At risk of failing to achieve good quantitative status - [overview table](#)
- Quantitative status reasons for failure [overview table](#) and [overview chart](#)
- Quantitative status in the 2nd and 1st RBMP - charts [by geological formation](#); [country comparison](#); and [by country and geological formation](#)
- Good quantitative status expected in 2015 [overview table](#) and expected achievement year of good quantitative status [overview table](#).

### Groundwater bodies: chemical status

- Chemical status - tables [overview table](#) and [by geological formation](#).
- Chemical status - charts [by geological formation](#); [country comparison](#); and [by country and geological formation](#)
- Chemical status - maps [by country](#); [by RBD](#); and [by country and RBD](#)
- Chemical status assessment confidence [overview table](#)
- At risk of failing to achieve good chemical status - [overview table](#)
- Chemical status reasons for failure [overview table](#) and [overview chart](#)
- Groundwater pollutants - tables [table by country](#); [overview table](#); [table trend reversal](#); [table upward trend](#); and [other pollutants](#)
- Groundwater pollutants - charts [causing failure](#); [upward trend](#); [trend reversal](#); [causing risk](#)
- Chemical status in the 2nd and 1st RBMPs - charts [by geological formation](#); [country comparison](#); and [by country and geological formation](#)
- Good chemical status expected in 2015 [overview table](#) and expected achievement year of good chemical status [overview table](#).

## Groundwater bodies quantitative and chemical status

There are two **table dashboards** presenting overview of groundwater quantitative status: [overview table](#) and [by geological formation](#); and two similar tables presenting overview of groundwater chemical status: [overview table](#) and [by geological formation](#).

### Main features

- The *overview tables* (quantitative status: [overview table](#) and chemical status: [overview table](#)) present the results by default by area in km<sup>2</sup> of groundwater bodies. Results may be changed to by number of groundwater bodies (filter measure).
- The tables by geological formation (quantitative status: [by geological formation](#) and chemical status: [by geological formation](#)) present the results by geological formation<sup>1</sup> and area in km<sup>2</sup> of groundwater bodies (default), but by using the filters results can be changed to by percentage (pane) or by number of groundwater bodies.
- Moving the mouse to NUT0 (column with Member States) a [+] will appear and clicking on [+] will drill down to RBDs.
- By default, Member States are shown in alphabetical order by the two-letter country abbreviation. It is possible to rank Member States, for example, by % in “Good” status by selecting the column and sort descending.
- Columns are sorted by selecting a column and right click on ascending or descending sort.



The current version the sorting by percentage is not possible (*EEA will look for a solution on this*).

Three **chart dashboards** present groundwater quantitative and chemical status ([by geological formation](#); [country comparison](#); and [by country and geological formation](#)).

### Main features

- The chart dashboards consist of a top chart illustrating groundwater quantitative status and a lower chart with groundwater chemical status.
- Water bodies with unknown status may be excluded by clicking on the grey unknown square in the legend. Remark there is a legend for quantitative and one for chemical status.
- The charts with [country comparison](#) illustrate the proportion of unknowns per country and the status classes (good or poor). Caution is advised when comparing Member States, as the results are affected by the methods Member States have used to collect data.

Three **map dashboards** present groundwater quantitative and chemical status ([by country](#); [by RBD](#); and [by country and RBD](#)).

### Main features

- The maps illustrate by default the proportion of water bodies failing to achieve good groundwater status (the worst status of quantitative or chemical status).
- In the filter ‘failing to achieve good’ either quantitative or chemical status can be selected. The filters may also be used to show percent failure with or without unknowns.
- Rolling over the maps pop-ups will show information for a specific country or RBD.

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<sup>1</sup> Geological formation: ‘porous’; ‘fissured’ and ‘fractured’.

### Expected status in 2015 and achievement year of good status

Two times two table dashboards present the status expected in 2015 (quantitative status: [overview table](#) and chemical status: [overview table](#)), and expected achievement year of good status (quantitative status: [overview table](#) and chemical status: [overview table](#)).

In the reporting Member States had the possibility to indicate whether it is expected that this groundwater body will achieve good quantitative or chemical status by the end of 2015. This may differ from the data reported under above quantitative or chemical status, because the assessment of status included in the second RBMP will most likely be based on monitoring data from the period 2010-2014, given that the second RBMP will be prepared in 2014 for public consultation. Therefore, the status communicated in the second RBMP may not necessarily reflect the expected status in 2015.

If good status will NOT be achieved by 2015 (i.e. the above-expected quantitative or chemical status in 2015 is No), Member States have reported the date (year) by which it is expected that it will be achieved.

#### Main features

- The results on expected status in 2015 (quantitative status: [overview table](#) and chemical status: [overview table](#)), differ from the 2<sup>nd</sup> RBMPs respective status as the 2015 results has no unknowns. Using the expected 2015 status there is an overall improvement in good quantitative status from 89 % to 90 %, and the percentage in good status is unchanged for chemical status (74% in good status).
- The table dashboard on and expected achievement year of good status (quantitative status: [overview table](#) and chemical status: [overview table](#)) present columns with 'water bodies already in good status (2015)', 'water bodies with less stringent objectives', and the expected achievement date of good status either by 'the end of the 2<sup>nd</sup> RBMPs (2021)', by 'the end of the 3<sup>rd</sup> RBMPs (2027) or after 2027'.
  - Relative few water bodies (1-2 %) have less stringent objectives.
  - Member States foresee nearly all groundwater bodies will achieve good quantitative status by the end of the 3<sup>rd</sup> RBMP (in 2027).
  - Member States foresee a major improvement in chemical status in the 3<sup>rd</sup> RBMPs (17 %), while 4-5 % of the area of groundwater bodies are not expected to achieve good chemical status in 2027.

### Quantitative or chemical status assessment confidence

Member States have with the 2<sup>nd</sup> RBMPs reported the quantitative and chemical status assessment confidence as either no information, low, medium or high confidence. The criteria used by Member States to assess confidence vary considerably, but general guidance has been: Low confidence (e.g. no monitoring data, or no conceptual model or understanding of the system); Medium confidence (e.g. limited or insufficiently robust monitoring data and expert judgment plays a significant role in assessment of status). High confidence (e.g. good monitoring data, and a good conceptual model or understanding of the system based on information on its natural characteristics and its pressures). Results on assessment confidence are only available for the second RBMPs.

#### Main features

- Two similar table dashboards (quantitative status: [overview table](#) and chemical status: [overview table](#)) present overview of area of groundwater bodies of high, medium, low or unknown quantitative or chemical status assessment confidence.
- Moving the mouse to NUT0 (column with Member States) a [+] will appear and clicking on [+] will drill down to RBDs.

### Risk of failing to achieve good quantitative status and reason for failure

One dashboard presents information of groundwater bodies at risk of failing to achieve good quantitative status ([overview table](#)) and two dashboards quantitative status reasons for failure ([overview table](#) and [overview chart](#)).

If the groundwater body is at risk of failing to be of good quantitative status, Member States have reported the Environmental Objective related to the risk from the enumeration list.

- ‘Uses or functions’ = The actual or potential legitimate uses or functions of the groundwater body.
- ‘Surface waters / terrestrial ecosystems’ = The relationship between groundwater bodies and the associated surface waters and directly dependent terrestrial ecosystems.

If the groundwater body is of poor quantitative status, the reasons for failure have been selected from the below enumeration list:

- ‘Water balance’ = Exceedance of available groundwater resource by long-term annual average rate of abstraction that may result in a decrease of groundwater levels.
- ‘Surface water’ = Failure to achieve Environmental Objectives (Article 4 WFD) for associated surface water bodies resulting from anthropogenic water level alteration or change in flow conditions; significant diminution of the status of surface waters resulting from anthropogenic water level alteration or change in flow conditions.
- ‘Groundwater dependent terrestrial ecosystems’ = Significant damage to groundwater dependent terrestrial ecosystems resulting from an anthropogenic water level alteration.
- ‘Saline or other intrusion’ = Regional saline or other intrusions resulting from anthropogenically induced sustained changes in flow direction.

Further guidance can be found in CIS Guidance Document 18 on the Groundwater Status and Trends Assessment<sup>2</sup>.

### Risk of failing to achieve good chemical status and reason for failure

One dashboard presents information of groundwater bodies at risk of failing to achieve good chemical status ([overview table](#)) and two dashboards chemical status reasons for failure ([overview table](#) and [overview chart](#)).

If the groundwater body is at risk of failing to be of good chemical status, Member States have reported the Environmental Objective to which the risk is related from the enumeration list:

- ‘Uses or functions’ = The actual or potential legitimate uses or functions of the groundwater body.
- ‘Surface waters / terrestrial ecosystems’ = The relationship between groundwater bodies and the associated surface waters and directly dependent terrestrial ecosystems.
- ‘Both’ = Both.

Further guidance can be found in CIS Guidance Document 18: Groundwater Status and Trends Assessment<sup>3</sup>.

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<sup>2</sup> <https://circabc.europa.eu/sd/a/8564a357-0e17-4619-bd76-a54a23fa7885/Guidance%20No%2026%20-%20GW%20risk%20assessment%20and%20conceptual%20models.pdf>

<sup>3</sup> <https://circabc.europa.eu/sd/a/8564a357-0e17-4619-bd76-a54a23fa7885/Guidance%20No%2026%20-%20GW%20risk%20assessment%20and%20conceptual%20models.pdf>

If the groundwater body is of poor chemical status, the reasons for failure have been selected from the enumeration list:

- 'General water quality assessment' = Significant impairment of human uses; significant environmental risk from pollutants across the groundwater body.
- 'Surface water' = Failure to achieve Environmental Objectives (Article 4 WFD) in associated surface water bodies or significant diminution of the ecological or chemical status of such surface water bodies.
- 'Groundwater dependent terrestrial ecosystems' = Significant damage to terrestrial ecosystems which depend directly on the groundwater body.
- 'Saline or other intrusion' = Regional saline or other intrusions resulting from anthropogenically induced sustained changes in flow direction.
- 'Drinking Water Protected Area' = Deterioration in quality of waters for human consumption.

### Comparison of groundwater status in the 2nd and 1st RBMPs

Two times three chart dashboards present groundwater quantitative (by geological formation; country comparison; and by country and geological formation) and chemical status (by geological formation; country comparison; and by country and geological formation) in the 2nd and 1st RBMPs.

#### Main features

- The filters (left panel) may be used to select the results presented. By default is presented the area of groundwater bodies, but in the 'measure filter' results can be changed by number of groundwater bodies.
- The filter 'water bodies' makes it possible to select only the water bodies that were unchanged from 1<sup>st</sup> to 2<sup>nd</sup> RBMPs; this filter will exclude countries with the majority of surface water bodies redelineated from 1<sup>st</sup> to 2<sup>nd</sup> RBMPs.
- Water bodies with unknown status may be excluded by clicking on 'Unknown' in the legend.
- Clicking on for example 'poor' in 1<sup>st</sup> RBMPs in (\*) will illustrate the status of these water bodies in the 2<sup>nd</sup> RBMPs. Clicking on 'good' will illustrate how many water bodies are still in good in 2<sup>nd</sup> RBMPs and the area groundwater bodies that have deteriorated.
- A special feature is 'Ctrl' clicking in 'good' and 'poor' in 1<sup>st</sup> RBMPs and excluding unknowns in legend will illustrate the status of groundwater with known status in 1<sup>st</sup> and 2<sup>nd</sup> RBMPs.

### Groundwater pollutants

Member States have for groundwater bodies failing to achieve good chemical status reported the pollutants causing failure. A water body may have more than one pollutant causing failure.

Five table dashboards and four chart dashboards present results on the groundwater pollutants causing failure

- Groundwater pollutants - tables [table by country](#); [overview table](#); [table trend reversal](#); [table upward trend](#); and [other pollutants](#)
- Groundwater pollutants - charts [causing failure](#); [upward trend](#); [trend reversal](#); and [causing risk](#)

#### Main features

- The main groundwater pollutant dashboard ([table by country](#)) has on top EU results and below results from Member States. The groundwater pollutant are ranked by area of groundwater bodies failing the threshold.
- The percentages are calculated as the proportion of water bodies failing due to the specific groundwater pollutant. As a water body may be affected by more than one pollutants the sum of percentage values is greater than 100 %.

- By using the filters different results on groundwater pollutants can be shown, for example, by selecting a specific groundwater pollutants the results will show the number or area of water bodies affected in different Member States.
- Selecting a specific Member State will illustrate the priority substances causing failure (select 'yes' in the filter causing failure). The (\*) indicate the discrete number of water bodies (if filter causing failure 'yes' only the water bodies with exceedance of threshold, while if causing failure 'all' (\*) is area of groundwater bodies/count of all water bodies (Filters have to show 'all')).
- The dashboard [overview table](#) presents an EU overview of the groundwater pollutants including number of Member States, and the number and area of groundwater bodies.
- The 'overview table' may similar to above be used to illustrate the groundwater pollutants per Member State. If filter causing failure 'yes' only the groundwater pollutants exceeding threshold values are shown. Remark that threshold value can vary between Member States and RBDs.
- There are small inconsistencies in the report values, for example, water bodies having good chemical status and groundwater pollutants causing failure.
- Member States have in the reporting indicated, whether there is a significant and sustained upward trend in the concentration of pollutant(s), or whether there is a trend reversal in the concentration of the pollutant(s). By using the filters in the dashboards results on upward trend and trend reversal can be shown.

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