COMMON IMPLEMENTATION STRATEGY FOR THE WATER FRAMEWORK DIRECTIVE AND THE FLOODS DIRECTIVE

WFD Reporting Guidance 2016

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WFD Reporting Guidance 2016

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LIST OF ACRONYMS

AWB	Artificial Water Body
BQE	Biological Quality Element
CIS	Common Implementation Strategy
CRS	Coordinate Reference Systems
CW	Coastal Water (in relation to a water body)
DPSIR	Drivers-Pressures-State-Impacts-Responses
EEA	European Environment Agency
EIONET	European Environment Information and Obervation Network
E-PRTR	European Pollutant Release and Transfer Register
EQS	Environmental Quality Standard
EQSD	EQS Directive
FAQ	Frequently Asked Questions
GCS	Good Chemical Status
GEP	Good Ecological Potential
GIS	Geographical Information System
GML	Geography Markup Language
GWB	Groundwater Body
GWD	Groundwater Directive
GWMET	Groundwater Methodolgies (title of a schema)
HMWB	Heavily Modified Water Body
IED	Industrial Emissions Directive
INSPIRE	Infrastructure for Spatial Information in the European Community (Directive 2007/2/EC)
IPPC	Integrated Pollution Prevention and Control (Directive)
IR	Implementing Rules
ISO	International Organization for Standardization
KTM	Key Type of Measure
LW	Lake (in relation to a water body)
maxOccurs	Indicates the maximum number of times an item can occur in the current context of a document. If MaxOccurs returns 0, the schema item should not appear. If maxOccurs returns UNBOUNDED(-1), the number of appearances of the schema item is unlimited.
MEP	Maximum Ecological Potential
minOccurs	Represents the minimum number of times that an item can occur in a document. A value of zero indicates that the item is optional.
MS	Member State
MSFD	Marine Strategy Framework Directive
NBL	Natural Background Levels
NiD	Nitrates Directive
NWRM	Natural Water Retention Measures
PoM	Programme of Measures
QE	Quality Element
RBD	River Basin District
RBDSUCA	River Basin District Sub Unit Competent Authority (title of a schema)

RBMP	River Basin Management Plan
RBMPPoM	Riber Basin Management Plan Programme of Measures (title of a schema)
RBSP	River Basin Specific Pollutant
ROD	Reporting Obligations Database
RPA	Pathway Oriented Approach
RW	River (in relation to a water body)
SCG	Strategic Co-ordination Group
SEIS	Shared Environmental Information Systems
SFA	Substance Flow Analysis
SIIF	Structured Implementation and Information Framework
SoE	State of the Environment
SOER	State of the Environment Report
SU	Sub Unit
SWB	Surface Water Body
SWD	Staff Working Document
SWMET	Surface Water Methodologies (title of a schema)
TeW	Territorial Water (in relation to a water body)
TG	Technical Guideline
TW	Transitional Water (in relation to a water body)
UML	Unified Modeling Language
URIs	Uniform Resource Identifiers
URL	Uniform Resource Locator
UWWT	Urban Waste Water Treatment Directive
WB	Water Body
WEI+	Water Exploitation Index
WFD	Water Framework Directive
WG DIS	CIS Working Group on Data and Information Sharing
WISE	Water Information System for Europe
WISE-SoE	The State of the Environment data flow to the Water Information System for Europe
WP	Work Programme
XML	Extensible Markup Language
XSD	XML Schema DefinitionGCS

1. INTRODUCTION

1.1. Purpose of this document

The purpose of this document is to provide Member States with guidance on how the various aspects of the Water Framework Directive (WFD) should be reported to the European Commission. This WFD Reporting Guidance brings together and updates the various elements of existing guidance documentation and materials into a single guidance document that can be used by those responsible for reporting data and information. It is hoped that this will streamline the reporting process, making it more efficient and consistent. This process will be further improved with the translation of this WFD Reporting Guidance into all EU languages.

In 2000, building on the achievements of existing EU water legislation, the Water Framework Directive (WFD) introduced new and ambitious objectives to protect aquatic ecosystems in a more holistic way, while considering the use of water for life and human development. The WFD incorporated into a legally binding instrument the key principles of integrated river basin management:

- The participatory approach in planning and management at river basin scale.
- The consideration of the whole hydrological cycle and all pressures and impacts affecting it.
- The integration of economic and ecological perspectives into water management.

It provided a framework to balance high levels of environmental protection with sustainable economic development.

The WFD foresaw a long implementation process leading to the adoption of the first River Basin Management Plans (RBMPs) in 2009 which described the actions envisaged to implement the Directive. The plans were expected to deliver the objectives of the WFD including non-deterioration of water status and the achievement of good status by 2015.

The WFD introduced a number of key principles into the management and protection of aquatic resources:

1. The integrated planning process at the scale of river basins, from characterisation to the definition of measures to reach Environmental Objectives.
2. A comprehensive assessment of pressures and impacts on, and the status of, the aquatic environment, including from the ecological perspective.
3. The economic analysis of the measures proposed or taken, and the use of economic instruments.
4. The integrated water resources management principle that encompassed targeting Environmental Objectives with the objectives of water management and related policies.
5. Public participation and active involvement in water management.

The key objectives of the WFD are:

- No deterioration of status for surface and groundwater bodies and the protection, enhancement and restoration of all water bodies.

- The achievement of good status for all water bodies by 2015. This comprises the objectives of good ecological status and good chemical status for all natural surface water bodies; good ecological potential and good chemical status for all heavily modified or artificial water bodies; and good quantitative status and good chemical status for all groundwater bodies.

- The progressive reduction of pollution of priority substances and the phase-out of priority hazardous substances in surface water bodies, and the prevention and limitation of the input of pollutants in groundwater bodies.

- The reversal of any significant, upward trend of pollutants in groundwater bodies.

- The achievement of Standards and objectives set for protected areas in Community legislation.

The planning process is a stepwise procedure in which each step is important to the next (see Figure 1), starting from the transposition of the Directive and the administrative arrangements, followed by the characterisation of the River Basin District (RBD), the monitoring and the assessment of status, the setting of objectives, and the establishment and implementation of an appropriate Programme of Measures, including the monitoring and evaluation of its effectiveness.

The key tool for the implementation of the WFD is the RBMP, including its Programme of Measures (PoM). The PoM is designed to enable the Member States to respond appropriately to the relevant pressures identified at RBD level during the pressures and impacts analysis, with the objective of enabling the river basin or water body to achieve good status. For example, if a significant pressure is overlooked during the pressures and impacts analysis, the monitoring programme may not be designed to assess the pressure, and the Programme of Measures may not envisage the appropriate action to address the pressure. The RBMP describes the execution of water management and identifies all actions to be taken in the RBD.

Figure 1 Schematic representation of the WFD planning process

Article 18 of the WFD requires the European Commission to publish assessment reports on the implementation of the Directive and to submit them to the European Parliament and to the Council. The assessment is based on information reported by Member States, comprising the published RBMPs and accompanying documentation required according to Article 15, the electronic reporting through the Water Information System for Europe (WISE) in predefined formats agreed by the Water Directors, and any additional, supporting background documents that the Member States consider relevant.

The RBMPs are comprehensive documents that cover many aspects of water management, consisting of hundreds to thousands of pages of information, published in national languages. The assessment of the RBMPs is a very challenging and complex task and involves dealing with extensive information in more than 20 languages. The quality of the European Commission's assessments relies on the quality of the Member States' reports. Bad or incomplete reporting can lead to wrong and/or incomplete assessments. It is recognised that reporting requires a significant commitment in terms of time and resources from the Member States, in particular the electronic reporting to WISE. During the assessment of the first RBMPs published in 2009, there were examples of very good, high quality reporting. However, there were also cases where reporting contained gaps or contradictions. It is expected that in the six years following the publication of the first RBMPs the quantity and quality of information available to support the implementation of the WFD will have improved, and that this in turn will lead to an improvement in the quality of reporting, and consequently the quality and completeness of the assessments that the European Commission is able to carry out.

The first reporting cycle and the related assessment by the European Commission and the European Environment Agency (EEA) was, in general, a positive exercise where all stakeholders have progressed a great deal in their understanding of the state of EU waters. However, it also resulted in a heavy workload, both at Member State (reporting) and EU (assessment) level. A thorough review of the reporting requirements for the second RBMPs has been carried out and, as a result, the Common Implementation Strategy (CIS) 'Guidance Document No. 21: Guidance for reporting under the Water Framework Directive' which facilitated the reporting of RBMPs in 2010 has been substantially revised. This document presents the revised WFD Reporting Guidance for reporting data and information relating to the second RBMPs.

The WFD Reporting Guidance, as with any other CIS Guidance, is the outcome of an informal, collaborative process between the European Commission, Member States, and other stakeholders, including other EU institutions. As such, it does not alter the requirements of the WFD or the Member States' obligations therein.

1.2. Principles of the review

The principles for the review of the WFD Reporting Guidance have been agreed by the Water Directors. They are:

- To clearly define the reporting requirements, precisely specifying the data and information to be reported on the basis of the requirements of the WFD and, when needed, additional requirements that would have to be approved by the Water Directors.

- To explore possibilities for reporting additional information based on an identification of the outputs linked to compliance checking, EU-wide assessments and benchmarking, and taking into account the inter-linkages with reporting on the other water related directives.

- To retain the main lines of reporting to WISE and stabilise datasets to be able to keep track of the progress.

- To simplify the reporting schemas as much as possible, and fully integrate them within the structure of WISE.

- To limit and focus the changes made to the Reporting Sheets.

- To harmonise the reporting scales.

- To limit reporting at the water body level to the minimum necessary.

The content of the data and information to be reported must, therefore, be simplified, leading to a reduction of the workload of the Member States and European Commission, whilst delivering useful data and information that are fit for purpose. The following are concrete requirements to this end:

- Electronic reporting should be focused on data and the identification (through targeted questions) of where detailed information on methodologies can be found in the RBMPs and accompanying documents, requiring searchable formats and secured availability. This will entail a very significant simplification of the methodological reporting schemas (e.g. on monitoring programmes, and surface water and groundwater methodologies).

- The structure of the schemas should be simplified, concentrating on a 'backbone' structure that would lead to a maximum of two levels. This should also ease the production of queries.

- Ensure consistency across the DPSIR chain (Drivers-Pressures-State-Impacts-Responses), mainly through the harmonisation of common reporting schemas listing drivers, pressures, status, impacts, and measures (responses), and the specification of rules for checking consistency, thereby enabling interoperability with streams of reporting under other water related legislation.

The DPSIR concept can rely on data and information gathered from various sources (e.g. monitoring, modelling, qualitative or quantitative estimates, etc) at different scales (e.g. water body, catchment, river basin). It is not a mathematical model applied at water body level, but is a useful conceptual framework to support the implementation of the WFD at different scales. The modalities of its practical application depend on the complexity of the situation in the RBD, the existing pressures and impacts, and the potential, feasible measures.

It is important to recall that reporting should be based on the obligations of the WFD. The reporting requirements presented in this WFD Reporting Guidance have been agreed through the CIS process and Member States have a commitment to report the electronic data and information requested to WISE. The reporting of data and information in accordance with this WFD Reporting Guidance should ensure completeness and comparability in both the reporting and assessment of the Member States' implementation of the WFD.

It is recognised that it may be difficult for some Member States to provide all the data and information in the format and structure requested by this Guidance. The reasons for non-reporting or incomplete reporting of specific data and information may be varied. For example, the Guidance has been adopted after the deadline for the finalisation of some preparatory work for the second RBMPs, including the pressure and impact analysis and the review of the economic analysis, both of which were due by the end of 2013. This makes it difficult for the Member States to adapt the information to the structures and the level of aggregation requested by the Guidance. Furthermore, some Member States may not be able to report certain aspects requested in the Guidance because of gaps in implementation.

Non-reporting or incomplete reporting according to the requirements set out in this Guidance does not necessarily imply that the Member State is not implementing the WFD correctly. Member States may have undertaken the relevant work but are simply not able to report it in the requested format and structure for a number of reasons. However, the European Commission relies largely on the data and information reported by Member States for its assessment of implementation and it is, therefore, essential that, if certain aspects are not reported or are incompletely reported, the Member State concerned explains the reasons. In such a circumstance, it is proposed that a 'Read me first' explanatory note be prepared by the Member State to accompany the electronic reporting, as explained below in Chapter 1.6, which would enable the Member State to report links or references to other pieces of supporting information where the necessary information may be found (if available).

The fact that some Member States may not be able to report certain data and information is not a reason to exclude these requirements from this Guidance as they may be able to report in the future. Indeed, other Member States will be able to report. A lowest common denominator approach should be avoided.

1.3. Structure of the document

This WFD Reporting Guidance is considerably longer than the 'CIS Guidance Document No. 21: Guidance for reporting under the Water Framework Directive' used by Member States during the reporting of the first RBMPs. This is because all of the relevant user documents and materials relating to the reporting of the second RBMPs have been consolidated into a single WFD Reporting Guidance (see Annexes) and more detail and help is provided on the terms used.

This WFD Reporting Guidance is largely structured on the basis of the schemas developed for the reporting of the first RBMPs in 2010. Chapters are structured on the basis of the level of reporting, i.e. surface water body, groundwater body, RBD or Member State. This means that information on certain issues may be distributed through more than one chapter. For example, data on status and pressures at water body level can be found in Chapter 2 for surface water bodies and Chapter 3 for groundwater bodies, whereas information on the methodologies on pressures and status can be found in Chapters 7 and 8, respectively.

Each chapter and sub-chapter includes the following sections:

- *Introduction*

  This section summarises the WFD obligations for the relevant topic and their role in the planning process.

- *How the European Commission and the EEA will use the information?*

  According to Article 18.2.b of the WFD, the European Commission must include a review of the status of surface water and groundwater in their reports on the implementation of the WFD in co-ordination with the EEA. Both the European Commission and the EEA will therefore use the data and information reported by Member States. This section identifies how the European Commission and the EEA will use the data and information reported, including the compliance checking and analysis that will be carried out and the products that will be developed from the data and information, such as tables, graphs, charts and maps. The list of products in the WFD Reporting Guidance is not exhaustive, i.e. the European Commission and the EEA may develop additional products later on in close consultation with Member States within the CIS process.

- *Contents of the 2016 reporting*

  - A sketch of the reporting schemas to show how the data and information should be structured in the files to be reported. These sketches are presented in UML notation. The corresponding XSD formats are available online in the WFD reporting resources page.

  - A technical description of the data and GIS information to be reported. This includes the respective schema element name; the field type or facet of the element (e.g. string, enumeration list, etc); some guidance regarding the schema element (e.g. whether it is required, conditional or optional – see section 1.8 below, its multiplicity by means of the minimum and maximum occurrence – minOccur and maxOccur, any related or supporting information that should also be reported, the content of enumeration lists, etc); and a brief description of any associated quality checks. (Note that the quality checks will be part of the validation processes performed on the reported data which will be made on the submission of data).

  - Guidance on the expected content of the RBMPs or background documents. In general, this replaces the methodological summaries that were reported in 2010. It is not intended to be comprehensive in terms of what the Member States have to include in their RBMPs or background documents, rather to provide certain concrete elements of information that should be reported (see section on Components of the 2016 reporting below).

  - Glossary providing clarification of terms and reporting requirements (where it is considered that this is needed).

1.4. How the European Commission and EEA will use the information provided

The information provided by the Member States will be used by the European Commission for the following purposes:

- Assessment of whether the implementation of the requirements of the WFD and its Daughter Directives (Groundwater Directive (2006/118/EC[1]); Directive on Environmental Quality Standards (Directive 2008/105/EC[2]); Directive (2013/39/EU[3]) amending Directives 2000/60/EC[4] and 2008/105/EC as regards priority substances in the field of water policy) is sufficient in each Member State (i.e. compliance assessment).

- Evaluation of the WFD and its Daughter Directives to identify whether the set objectives of the directives have been achieved and to assess what can be improved in the future.

- Preparation of reports for the European Parliament, Council of Ministers and the general public on the implementation of the WFD and its daughter directives, and the improvements in the state of the water environment that have been achieved as a result.

- Determination of the appropriate level of EU funding to support the implementation of policies (e.g. through structural, cohesion, rural development and other funding).

In addition, the EEA will use the information provided to supplement the data collected through its own reporting streams when producing European, pan-European and regional integrated environmental data and indicator sets, assessments and thematic analyses.

As with the reporting of the first RBMPs, reporting is made at different levels:

- *Water body level*

  The water body is the assessment level of the WFD. It is the basic physical unit of the Directive to which characterisation, pressures, impacts, objectives, monitoring and assessments are attached. It is, therefore, the main reporting unit for these components of WFD implementation. Information at water body level will be seamlessly presented in WISE, and aggregation at RBD, national and EU levels will be made possible by this reporting. The European Commission will not be able to properly assess implementation without information reported at water body level.

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1 Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration: http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1410784650720&uri=CELEX:32006L0118

2 Directive 2008/105/EC of the European Parliament and of the Council of 16 December 2008 on environmental quality standards in the field of water policy, amending and subsequently repealing Council Directives 82/176/EEC, 83/513/EEC, 84/156/EEC, 84/491/EEC, 86/280/EEC and amending Directive 2000/60/EC of the European Parliament and of the Council: http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1410784732488&uri=CELEX:02008L0105-20130913

3 Directive 2013/39/EU of the European Parliament and of the Council of 12 August 2013 amending Directives 2000/60/EC and 2008/105/EC as regards priority substances in the field of water policy: http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1410784774193&uri=CELEX:32013L0039

4 Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy: http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1410784832288&uri=CELEX:02000L0060-20140101

- *River Basin District or Sub-unit level*

  Methodologies and approaches are usually developed at (the national part of) RBD or national level, hence this is the appropriate level for reporting. In addition, measures are reported at (the national part of) RBD or Sub-unit level[5], in accordance with the WFD's requirements to include a summary of the Programme of Measures in the RBMPs. Reporting of measures at water body level would be disproportionate and not useful at EU level.

As national reporting systems evolve in line with the INSPIRE requirements, physical reporting to the EU level may become less necessary. However, these developments will be supported by linking WISE to the national systems. In the meantime, the European Commission and the Member States will continue working on the basis of the available tools. More information about future reporting exercises is included in Chapter 12 of this WFD Reporting Guidance.

The European Commission and the EEA continue to have a need to carry out the in-depth assessment of new and emerging issues in the field of 'water', and to identify how these are affecting the water environment and are being addressed by Member States' policies. The European Commission also faces frequent and time-consuming requests for information from the European Parliament and citizens. Detailed and complete WFD reporting should provide a valuable source of information to support these assessments and requests.

1.5. New reporting contents for 2016

Reporting of the second RBMPs in 2016 brings new elements into play: some due to legislation which was not fully in force at the time the first RBMPs were adopted; others due to the fact that the second RBMPs can be compared with the first RBMPs, thereby allowing assessments of progress towards objectives. The following section indicates a number of elements that are new for the 2016 reporting exercise and are addressed in the revised WFD Reporting Guidance.

- In general terms, the second RBMPs provide the opportunity to establish progress in a number of aspects since the adoption of the first RBMP in 2009[6]:
  - First and foremost, **progress towards the achievement of Environmental Objectives** by comparing the status reported in the second RBMPs with the first RBMPs. Following the discussions within the CIS (WG DIS, SCG and Water Directors), reporting of the second RBMPs will allow the assessment of progress achieved in individual quality elements in addition to the reporting of global ecological and chemical status.
  - Progress towards the **target of expected achievement of good status by 2015**. Following the previous reporting exercise, this information was derived by the European

[5] Sub-units were developed by the CIS Working Group Reporting in 2008 as an intermediate reporting scale between water bodies and RBDs for cases where RBDs are very large. The purpose of sub-units is to present aggregated information at an EU level in a meaningful way. The provision of Sub-units is completely voluntary, and they can be based either on hydrological boundaries, or administrative boundaries depending on what is easier for the Member State.

[6] See WFD Annex VII B.2.

Commission from the information reported on exemptions in the first RBMPs by the Member States. This resulted in some difficulties in interpretation, in particular in relation to the water bodies with unknown status. In the second RBMPs, it is explicitly requested that Member States report at water body level whether it is *expected* that the water body will achieve good status in 2015. This will provide Member States with more control of this key information and will avoid incorrect results in the aggregation process at EU level. The direct use of the assessment of status contained in the second RBMPs may lead to incorrect assessments being made, as this status assessment will most likely be based on monitoring data from the period 2010-2013, given that the RBMPs will be prepared in 2014 for public consultation. Therefore, the status communicated within the RBMPs will not necessarily reflect the expected status in 2015. Depending on the approach adopted in the Member State, the results from the 2013 risk assessment (WFD Article 5) may also contribute in determining whether the water bodies will achieve good status in 2015. This request will not lead to any new ad-hoc assessment, but the Member States will be able to use the results of the 2013 risk assessment together with the status assessments included in the second RBMPs, to provide the European Commission with the relevant information.

- It is expected that the second RBMPs will also bring about **improvement of methodologies** in many Member States. These improvements are expected to fill the gaps found in the first RBMPs.

- WFD Annex VII part B also requires Member States to report in the second RBMP **the changes since the first RBMP**, in particular:
  - A summary of the reviews of the exemptions made under Articles 4(4) to 4(7).
  - An explanation of any Environmental Objectives which have not been reached.
  - A summary and an explanation of the measures foreseen in the first RBMPs which have not been taken.
  - A summary of the additional measures taken under Article 11(5) since the publication of the first RBMPs.

Some Member States may have **re-delineated (some of) their water bodies** as part of the review of the characterisation of the RBD.

The EQS Directive 2008/105/EC, as adopted in 2008, will be fully in force for the second RBMPs. Some Member States did not implement the Directive in the first RBMPs given the fact that transposition deadline was in July 2010, after the adoption of the RBMPs. **The following elements of the EQS Directive which were not reported in 2010 are relevant for the second RBMPs**:

- Inventory of emissions, discharges and losses.
- Trend monitoring in sediment and/or biota of Priority Substances.

- Mixing zones.

In addition, the **QA/QC Directive** 2009/90/EC[7] is fully in force for the second RBMPs.

It should also be noted that whilst the deadline for transposition of **Directive 2013/39/EU** regarding Priority Substances is 14 September 2015, the Programmes of Measures reported in 2016 must include measures to achieve good chemical status for those substances where the EQS has been revised.

As regards the Groundwater Directive, **the assessment of trends of pollutants in groundwater** will be possible for the first time in the second RBMPs, by comparing the monitoring results with the first RBMPs.

1.6. Components of 2016 reporting

The 2010 reporting exercise relating to the first RBMPs comprised 3 main components:

- The RBMPs, PoMs and supporting background documents.
- The electronic structured data (XML files).
- Spatial datasets.

For the 2016 reporting exercise relating to the second RBMPs, the same 3 components are expected. However, the experience of the 2010 reporting exercise showed that reporting of methodologies through long summary text was not useful or appropriate. It was often necessary to consult more detailed background documents to understand the approaches taken by Member States. It was also burdensome for Member States to prepare ad-hoc summaries for all the methodological aspects requested. Consequently, an alternative approach will be taken in the 2016 reporting exercise which will be based on **targeted questions** derived from the compliance assessment of the first RBMPs. Where possible, a number of closed (restricted) answers are provided for each question, from which the Member State should choose the most appropriate response. The Member State should also then provide a precise reference to the relevant section of the RBMP, PoM or background document where more detailed information can be found. This approach will significantly reduce the burden and complexity of both reporting and assessing summaries of text. The available information in the RBMPs and/or accompanying background documents will be sufficient. However, in order to ensure that all necessary information is available for assessment, this approach is complemented with **guidance on the contents of RBMPs, PoMs or background documents** on specific issues, so that the more detailed information can easily be found. It should be stressed, though, that **this guidance on contents is not exhaustive** and covers only specific methodological elements which are deemed necessary to be reported. The RBMPs should contain many other aspects as established in the WFD.

[7] Commission Directive 2009/90/EC of 31 July 2009 laying down, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, technical specifications for chemical analysis and monitoring of water status: http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1410785085516&uri=CELEX:32009L0090

As stated in Section 1.2, it will be difficult for some Member States to provide all data and information requested in the WFD Reporting Guidance, due to gaps in implementation or other reasons. **Member States are, therefore, asked to upload a short explanatory note (a 'Read me first' document)** which should identify what information the Member State is unable to report and the reasons why, according to the template presented in Annex 0. If some information exists, but not in the requested form and therefore could not be reported, Member States should include references to where the information can be found. If the information cannot be provided due to other reasons, Member States should provide a brief explanation for the current position. If the reasons are due to gaps or delays in implementation, Member States are expected to explain their plans for addressing the gaps, or provide references to where to find the outlooks in the RBMPs. This information can either be reported at Member State or RBD level. If Member States have reported all requested information, this explanatory note is not necessary.

1.7. Reporting of RBMPs and Background Documents

The report on lessons learned from the reporting and assessment of the first RBMPs showed that significant problems had been encountered when Member States had reported unstable hyperlinks. In some cases hyperlinks changed during the period between reporting and assessment, and in other cases the documents being referred to be amended or updated resulting in discrepancies between the information reported in the RBMPs or electronic data and the contents of the background document.

In order to overcome these difficulties, Member States will have two options for the provision of background documents:

1. Upload a copy of the documents to WISE, including a clear reference (document and section) where required in the electronic data (guidance on the naming of files is included in the user manual for reporting to WISE, see Annex 6).

2. Include a clear reference (document and section) and a URL to the document stored in the Member State. Where this option is selected, the Member State must guarantee that the hyperlink will remain active for a period of 6 years after reporting and that the document referred to will not be updated.

1.8. Mandatory vs voluntary reporting

According to the WFD Article 15, Member States are required to submit copies of their RBMPs to the European Commission. Article 20 provides the European Commission with the possibility to develop technical formats for the purposes of reporting through the comitology procedure. This has never been used. Instead, an agreement was reached with the Water Directors in 2003 to develop WISE through the informal CIS process. The result of this process is the CIS 'Guidance Document No. 21: Guidance for reporting under the Water Framework Directive' and the procedure and guidance for the electronic reporting of data to WISE which is reviewed in this WFD Reporting Guidance document.

The basis for the electronic reporting of data is therefore informal and not legally binding. However, it is clear that without the electronic reporting of data the European Commission would have difficulties in performing its tasks of compliance checking and reporting to the Council and the European Parliament on the implementation of the WFD. In addition, the European Commission

has the task of reviewing EU policies and proposing changes if needed. The review of the WFD is scheduled for 2019. The reporting and subsequent assessment of data relating to the second RBMPs in 2016 will be one of the key elements of information that the European Commission will have to inform such a review.

Against this background, the WFD Reporting Guidance classifies the data elements of the electronic reporting in three categories:

- Required: reporting is expected.
- Conditional: depending on the contents or the replies to some reporting elements, conditional elements may be required or not necessary.
- Optional: these are elements which provide further information if considered appropriate by the Member States, or the information qualified as 'if possible' or 'if available' in this WFD Reporting Guidance.

The validation rules applied to the reported data, in order to ensure quality assurance, have been developed on this basis. **This classification**, which is considered useful, has been retained for the reporting of the second RBMPs. However, optional elements have been kept to a minimum as the focus of the reporting exercise is on data and information required for clear and specific purposes.

1.9. Complementarity with other reporting streams

Reporting under the WFD needs to be made in conjunction with other **reporting obligations under other directives** such as the Urban Waste Water Treatment[8], Nitrates[9], Drinking Water[10], Bathing Water[11], and Marine Strategy Framework Directives[12], etc, and also with the **EEA's State of the Environment (SoE) data flows**. Complementarity of these data flows needs to be ensured, avoiding duplications and reusing as much data and information as possible for different purposes.

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8 Council Directive 91/271/EEC of 21 May 1991 concerning urban waste-water treatment http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31991L0271&qid=1439549071803&from=EN

9 Council Directive 91/676/EEC of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31991L0676&from=EN

10 Council Directive 98/83/EC of 3 November 1998 on the quality of water intended for human consumption http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31998L0083&from=en

11 Directive 2006/7/EC of the European Parliament and of the Council of 15 February 2006 concerning the management of bathing water quality and repealing Directive 76/160/EEC http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32006L0007&qid=1439550272397&from=EN

12 Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive) http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32008L0056&qid=1439550339839&from=EN

1.9.1. EEA's State of the Environment (SoE) reporting

In the mid 1990s the EEA established reporting of water data under its Regulation[13], with data on water quality from a range of monitoring stations in its member countries (in 2013 ~15000 river monitoring stations were reported) as part of the EEA-EIONET. In Chapter 4 on monitoring the importance of having the WFD monitoring network coordinated with the stations reported to EEA SoE is described. The observation results (e.g. water quality concentrations, ecological quality ratios (EQRs) for biological quality elements) from stations in the WFD monitoring networks should as far as possible be reported to EEA Waterbases. These data will be used by the EEA in producing trend assessments and overviews of the status of, and pressures affecting, Europe's surface waters and groundwater. Since 2008 this EIONET reporting contains also data on emissions to water and water quantity.

The information on emissions and water quantity plays an important role as pressure information in EEA's State of Environment reporting, as it allows for complementing assessments in the DPSIR framework. The SoE information is, in most cases, more detailed than the information in WFD reporting, as it is reported for the purpose of the environmental assessments and trend analysis that are included in the SoE reports that EEA compiles every 5 years with its member countries (see e.g. SOER 2010 and 2015).

The details about how the data flows on SoE emissions and on SoE water quantity are structured are agreed with the Member Countries of EEA (EU-28 plus Norway, Iceland, Lichtenstein, Switzerland and Turkey) in the context of the EIONET and described in the SoE-reporting guidance [link]. The reporting is set as an annual reporting exercise at the level of RBD (or national portion of RBD) or Sub-unit.

The current structure of the data sets reported under SoE emissions and water quantity is, in its data model, very close to what is required under the WFD for the pressure information on emissions to water and water quantity (water abstraction and use).

To facilitate the WFD reporting and to avoid double reporting, most of the information required in chapters 9.2 and 9.3 of this document could be obtained directly or derived from the information reported to EEA under the SoE reporting stream, provided that MS participate in the SoE reporting.

The practical process of using already reported SoE information in the context of the WFD could be described as follows:

[13] Regulation (EC) No 401/2009 of the European Parliament and of the Council of 23 April 2009 on the European Environment Agency and the European Environment Information and Observation Network (Codified version) http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32009R0401&qid=1439550465427&from=EN

Figure 2 Synergies between WFD and SoE reporting

It will be up to each Member State, if they participated in the EEA SoE reporting, to decide whether path A or path B will be followed for each parameter. The SoE information will be used only if the Member State does not chose to provide new information specifically for the purpose of the WFD.

SoE reporting happens on an annual basis (once a year also for parameters with a higher resolution e.g. monthly or seasonal data for water use). As the WFD requires information only every 6 years, agreements need to be made on aggregation and use in the WFD context.

The information about which member States are participating in the SoE reporting and with which parameters can be seen in the annual priority data overview published by EEA e.g. 2013 [link]

In terms of technical implementation, both information flows are held at EEA in a common data space (grey area in the graph above). Therefore, when path B will be followed the SoE information can easily be made available in the WFD parts of the data space. As part of the upgrade of WISE into WISE 2.0 the EEA is working on increasing transparency of all data available under the SoE regime and to enable Member Countries' reporters easy access to control which data have been reported and are available for which purpose.

The details on how path B would function in terms of conditionalities in schema elements and mapping of data structure is further described in sections 9.2 and 9.3 of this document.

1.9.2. Reporting under other water and marine directives

The development of WISE over the past few years has made significant progress in streamlining the reporting requirements under the various water directives, avoiding double reporting and promoting the principle 'report once, use many'. The various water directives, such as Urban Waste Water Treatment, Nitrates, Drinking Water and Bathing Water Directives, include specific requirements that need to be reported within a particular timetable under the respective reporting streams. However, streamlining with the WFD means that there is no need to report the same information several times (e.g. Sensitive Areas, Nitrate Vulnerable Zones) and appropriate links

have been established, mainly through the use of the water body code. Building on this WFD Reporting Guidance and the processes to review the reporting requirements under other water-related directives, the objective is to continue improving this alignment to reduce the reporting burden on Member States and enable a more useful and efficient use of the available information. In this sense, the experience gained in the work to develop the Structured Implementation and Information Framework (SIIF) for the Urban Waste Water Treatment Directive will be very valuable. As regards the Drinking Water Directive, the on-going critical analysis on existing reporting and the development of a new concept for future reporting will also provide a good opportunity for further streamlining.

In the case of the Marine Strategy Framework Directive (MSFD), the Water and Marine Directors have agreed some principles[14] to exploit synergies and reduce the administrative burden to the greatest extent possible. The European Commission and the Member States will work on this basis in the coming months to ensure a smooth and efficient alignment of the respective reporting streams.

1.10. Summary of the main changes introduced since 2010 reporting

The following table summarises the main changes in the reporting requirements for the second RBMPs in 2016 since the previous reporting exercise in 2010. For more detailed information, see the relevant noted Sections.

Topic	Summary of main changes	Sections
Spatial datasets for water bodies and monitoring stations	Report GIS information for all surface and groundwater bodies (instead of main rivers and main lakes only) and for monitoring stations. All spatial datasets reported at national level (instead of at RBD level).	Annex 5
Water bodies (surface and groundwater)	If a water body has been re-delineated, report the water body code for each re-delineated water body and also the water body code for the associated water body (or bodies) reported in the first RBMP in order that comparisons of status can be made. Such re-delineation may have involved the splitting of previously reported water bodies into two or more water bodies, or the combination of two or more previously reported water bodies into a single water body. This information is included in the spatial dataset.	Annex 5
Heavily Modified Water Bodies (HMWB)	Report the water use and type of physical modification for which the HMWB has been designated.	2.2.4.1
Pressures and impacts	Use new list of drivers, pressures and impacts common for surface and groundwater.	Annex 1
Ecological status of surface water bodies	• Report the reference year for status assessment. • Provide status information at the more detailed quality element (QE) level (including reference year) and the change in class since the first RBMP was reported, if available. • Report water bodies used for grouping if no monitoring is available. • Report the substances (River Basin Specific Pollutants (RBSP)) causing failure. • Report whether the water body is expected to achieve good ecological status in 2015 and if not, by when. • Report the drivers behind exemptions at water body level, not at	2.4.3.2

[14] See related document WMD/2014-1/4 and conclusions from the Water and Marine Directors meeting in Greece (June 2014)

Topic	Summary of main changes	Sections
	QE level.	
Chemical status of surface water bodies	• Report the reference year for status assessment. • Report failure of individual substances. • Provide a qualitative indication of the confidence in the chemical status assessment. • Indicate the substances that have improved from poor to good chemical status since the first RBMP was reported. • Indicate if the more stringent EQSs introduced in 2013 for 7 substances change the status of water bodies. • Report whether the water body is expected to achieve good chemical status in 2015 and if not, by when. • Report the drivers behind exemptions at substance level.	2.5.3.2
Mixing zones	For each water body: • Report whether mixing zones have been designated. • Report the percentage of length or area of the water bodies which have been designated as mixing zones (optional). • Report substances exceeding or expecting to exceed EQSs within the mixing zones in the water body (optional).	2.5.3.2
Status of groundwater bodies	• Report whether the groundwater body is at risk, in terms of either quantitative or chemical status, and, if the latter, report the individual substances causing risk. • If the groundwater bodies are at risk, report the Environmental Objectives at risk. • Report individual substances causing failure to chemical status. • Report whether it is expected that the groundwater body will achieve good quantitative and good chemical status in 2015 and if not, by when. • Provide a qualitative indication of the confidence in the classification of quantitative and chemical status (optional). • Report substances showing exceedances of quality standards or threshold values but not assessed as chemical status failures, i.e. cases in which Article 4(2)c of the GWD apply. • Report the drivers behind exemptions at water body quantitative level and/or at chemical substance level.	3.4.3.2 3.5.3.2
Monitoring	• Report quality elements at levels[15] 2 or 3 for biological and hydromorphological elements. • Report quality elements at level 3 for physico-chemical elements. • For Priority Substances and RBSP in surface waters, information on the individual substances monitored is requested. • For groundwater parameters, information is requested at level 2 which for some equates to specific substances and for others equates to groups of substances. • Indicate the last year when the quality elements were monitored. • Report the water category at station level. • Report whether stations are new or were reported in the first RBMPs in 2010. • The monitoring programmes schema has been significantly simplified. It is only necessary to report the list of programmes and their scope or purpose.	4.3.2

[15] The word level here refers to the 2010 reporting of quality elements, being level 2 e.g.QE1-4 Fish and level 3 e.g. QE3-1-4 Salinity.

Topic	Summary of main changes	Sections
	• For priority substances, distinguish status monitoring from trend monitoring.	
Protected Areas	• Deletion of the textual description of the register of Protected Areas. • Reporting of objectives and status is tailored to each type of Protected Area covering only 3 types (Habitats/Birds, Shellfish and Drinking Water).	5.3.2
River Basin Districts/Sub-units and Competent Authorities	• Deletion of summary text. • Categorisation of roles has been replaced by a more precise list of roles.	6.3.2
Surface water typology and characterisation methodology	• Reporting of factors used in typology is no longer requested. • Indicate whether reservoirs are reported as heavily modified rivers or lakes. • Report the list of types with a brief description. • Report correspondence with intercalibration types. • Deletion of summary text. • There are fewer targeted questions on reference conditions.	7.2.3.2
Classification of ecological status/potential of surface water	• Large parts of the schema on surface water classification have been deleted, in particular summary texts (some have been replaced with targeted questions, such as on one-out, all-out, grouping and good ecological potential (GEP)), the reporting of thresholds for BQEs, for high-good boundaries of physico-chemical and hydromorphological parameters, and RBSPs. • Report the status of development of BQE assessment methods and their sensitivity to impacts. • Report whether the RBSPs' EQSs have been derived using the 2011 Technical Guidance Document and whether the analytical methods fulfil the requirements of the QA/QC Directive.	7.3.3.2
Classification of chemical status	• Report the standards used for the assessment of chemical status (standard, matrix, purpose, water category, conformity with 2011 TGD, fulfilment of the requirements of the QA/QC Directive). • Targeted questions have been included on the percentage of water bodies not monitored, the approach to assess status without monitoring, implementation of the QA/QC Directive, use of background concentrations and bioavailability, trend assessment, and the methodology for mixing zones.	7.4.3.2
Groundwater characterisation methodology	• This schema has been deleted. Detailed guidance is provided on the information that should be included in the second RBMP or accompanying documents.	8.2.3.2
Classification of groundwater status (quantitative and chemical	• Deletion of summary text, replaced with targeted questions on diminution/damage, exceedances, assessment of needs of terrestrial ecosystems, trend assessment and development of threshold values.	8.3.3.2
RBMPs	• Deletion of summary text, replaced with targeted questions covering sub-plans, SEA, stakeholder involvement and international co-ordination.	9.2.3.2
Loads and emissions of pollutants to surface water and groundwater	• Information collection to be streamlined with EEA reporting on emissions to water (SoE-Emissions).	9.3.3.2
Water abstractions and exploitation of water resources	• Information collection to be streamlined with EEA reporting on water quantity (SoE-Water Quantity).	9.4.3.2
Programmes of Measures	• Reporting on the implementation of Basic Measures under Article 11.3.a is no longer required. • Reporting on the implementation of Basic Measures under Article	10.1.8

Topic	Summary of main changes	Sections
	11.3.b to l replaced by targeted questions • Reporting on the need for Supplementary Measures is no longer required. • Deletion of the Pressures Measures Check List. The information is now requested as measures required to tackle significant pressures. • New request for specific information on the measures being planned to meet WFD Environmental Objectives for Priority Substances.	
	• Reporting on specific measures to achieve the EQSs for Priority Substances.	10.1.8
	• Number of Key Types of Measures has been increased from 16 to 25 broad measure types that cover the most prevalent significant pressures at EU level and the implementation of which are expected to deliver most of the improvements required to achieve WFD Environmental Objectives. KTMs were first introduced for the 3rd WFD implementation report – assessment of River Basin Management Plans (2012)[16], their aim to reduce the very large number of Supplementary Measures reported by some Member States and to simplify the reporting of measures. • Quantitative indicators of expected progress or achievement between 2015 and 2021 are requested.	10.1.3
	• List of Supplementary Measures changed to List of Measures with links to basic measure types requested,	10.1.8
	• Deletion of summary text, replaced with targeted questions on specific measures and aspects of the PoMs. • Links to specific background documents to be reported by Member States.	10.2
	• Targeted questions and enumeration lists added relating to the progress made and achievements of the first RBMPs and PoMs. • Links to specific background documents to be reported by Member States.	10.5
Costs of Measures	• Costs to be reported for the first cycle and planned for second cycle (2015 to 2021) in terms of investment costs (not annualised), annual operational and maintenance costs and other costs (not annualised) for Basic Measures under Article 11.3.a, Basic Measures under Article 11.3.b to l, Supplementary Measures under Article 11.4 and Additional Measures under Article 11.5. • Revision of elements to obtain information on financing of measures for the first cycle and planned for the second cycle (2015 to 2021).	10.3.3.2
Economic analysis and cost recovery	• Revised and simplified structure to report information on the updated economic analysis with targeted questions and enumeration lists. • Links to specific background documents to be reported by Member States.	11.2.2

Specific guidance for the preparation of the contents of the second RBMPs and/or background documents has been included in the following chapters and the Annexes.

[16] 3rd WFD implementation report – assessment of River Basin Management Plans (2012): http://ec.europa.eu/environment/archives/water/implrep2007/index_en.htm#third

1.11. Overview of the reporting schemas

The following schemas have been developed for the 2016 reporting and are described in the following chapters of the guidance (XML refers to tabular data and GML refers to geographical data):

Schema name	Type	Reporting scale	Contents	Chapter
RBDSUCA	XML	National (1 file per MS)	River Basin Districts, Sub-units and Competent Authorities	6
SWB	XML	RBD (1 file per RBD)	Surface water bodies (information at water body level)	2 and 5
GWB	XML	RBD (1 file per RBD)	Groundwater bodies (information at water body level)	3 and 5
Monitoring	XML	RBD (1 file per RBD)	Monitoring programmes and monitoring sites for surface and groundwater bodies	4 and 5
SWMET	XML	RBD (1 file per RBD)	Information on methodologies linked to surface water	7
GWMET	XML	RBD (1 file per RBD)	Information on methodologies linked to groundwater	8
RBMPPoM	XML	RBD (1 file per RBD)	Information on the River Basin Management Plans, Programme of Measures and Economic Analysis	9, 10 and 11
RiverBasinDistrict	GML	National (1 file per MS)	Geographical information: River Basin Districts	Annex 5
SubUnit	GML	National (1 file per MS)	Geographical information: Sub-units	Annex 5
SurfaceWaterBody	GML	National (1 file per MS)	Geographical information: Surface Water Bodies reported as polygons	Annex 5
SurfaceWaterBodyLine	GML	National (1 file per MS)	Geographical information: Surface Water Bodies reported as lines	Annex 5
SurfaceWaterBodyCentreline	GML	National (1 file per MS)	Geographical information: representation of the centrelines of surface water bodies to conform a hydrographic network	Annex 5
GroundWaterBody	GML	National (1 file per MS)	Geographical information: Groundwater bodies (all, reported as polygons)	Annex 5

Schema name	Type	Reporting scale	Contents	Chapter
GroundWaterBodyHorizon	GML	National (1 file per MS)	Geographical information: Parts of groundwater bodies if linked to different horizons	Annex 5
MonitoringSite	GML	National (1 file per MS)	Geographical information: monitoring sites for surface and groundwater (reported as points)	Annex 5
ProtectedArea	GML	National (1 file per MS)	Geographical information: Protected areas reported as polygons	Annex 5
ProtectedAreaLine	GML	National (1 file per MS)	Geographical information: Protected Areas reported as lines	Annex 5
ProtectedAreaPoint	GML	National (1 file per MS)	Geographical information: Protected Areas reported as points	Annex 5

All XML schemas include a header with the following information (the element euRBDCode is not included in the RBDSUCA file as there is only 1 per Member State):

Schema element: countryCode **Field type / facets / relationship**: CountryCode_Enum **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Two-letter ISO country code[17].
Schema element: euRBDCode **Field type / facets / relationship**: FeatureUniqueEUCodeType **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Unique EU code of the River Basin District. Prefix the RBD's national, unique code with the Member State's 2-alpha character ISO country code. **Quality checks:** Element check: First 2 characters must be the Member State's 2-alpha character ISO country code. Cross-schema check: The reported euRBDCode must be consistent with the codes reported in RBDSUCA/RBD/euRBDCode.
Schema element: creationDate **Field type / facets / relationship**: DateType

[17] Member State's 2-alpha character ISO country code: http://publications.europa.eu/code/en/en-370100.htm (Note: for Greece use 'EL' and United Kingdom use 'UK')

Properties: maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Creation date of the file.
Schema element: creator **Field type / facets / relationship**: string **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Creator of the file.
Schema element: description **Field type / facets / relationship**: string **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Description of the file.
Schema element: email **Field type / facets / relationship**: string **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Contact email of data reporter.
Schema element: fileName **Field type / facets / relationship**: string **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Name of the file.
Schema element: generatedBy **Field type / facets / relationship**: string **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Name and/or organisation of data reporter.
Schema element: language **Field type / facets / relationship**: LanguageCode_Enum **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Code of the language of the file.

2. REPORTING AT SURFACE WATER BODY LEVEL (SCHEMA SWB)

2.1. Overview of the structure of the 2016 reporting contents

Reporting at surface water body level is done for each RBD. For the purpose of presentation in this guidance, the contents of reporting are structured according to the following sub-chapters:

- Surface water body characterisation
- Pressures and impacts on surface water bodies

- Ecological status and exemptions
- Chemical status of surface waters, exemptions and mixing zones

The following sections describe the contents of reporting. The UML diagram of the SWB schema is found in Annex 10.2.

2.2. Characterisation of surface waters

2.2.1. Introduction

Article 5 of the WFD requires Member States to identify surface water bodies that will be used for assessing progress with, and achievement of, the WFD's Environmental Objectives. In addition, under certain conditions, Article 4(3) of the WFD permits Member States to identify and designate artificial water bodies (AWBs) and heavily modified water bodies (HMWBs). AWBs and HMWBs are required to achieve Good Ecological Potential (GEP) by 2015. Article 5 of the WFD also requires Member States to analyse the characteristics of surface water bodies (SWBs) and provide a summary report on surface water characterisation including general information on their typology.

Characterisation is a key step in the implementation of the WFD and it needs to be undertaken thoroughly and correctly in order to enable the objectives of the Directive to be efficiently and correctly achieved. Characterisation should identify all relevant categories and types of water bodies within the RBD for which specific typologies and reference conditions have to be established. This step is crucial in obtaining robust ecological status assessment and classification systems and, in particular, correctly identifying water bodies at risk of failing objectives which will subsequently become the focus for the implementation of necessary measures for the achievement of objectives.

Water bodies should be delineated at a size that allows the identification and quantification of significant pressures and the classification of status (detailed guidance is provided in CIS Guidance Document No. 2: Identification of Water Bodies[18]). If water bodies are identified that do not permit an accurate description of the status of the aquatic ecosystems, the impacts of pressures may be masked and not detected. If water bodies are too small, there may be too many water bodies for a Member State to deal with in a cost-effective way. The optimum size of a water body is the size that allows the objectives of the Directive to be most efficiently achieved.

Characterisation also requires the assessment of the risk that a water body may fail the objectives of the Directive in 2015 unless appropriate measures are taken. The results of the risk assessment inform the monitoring of water bodies and the subsequent classification of status. It is crucial that methodologies used in risk assessment are fit for purpose, in the sense of being able to identify and quantify all pressures within the RBD and their potential impact on the status of water bodies (detailed guidance is provided in CIS Guidance Document No. 3: Analysis of Pressures and

[18] CIS Guidance Document No. 2: Identification of Water Bodies: https://circabc.europa.eu/sd/a/655e3e31-3b5d-4053-be19-15bd22b15ba9/Guidance%20No%202%20-%20Identification%20of%20water%20bodies.pdf

Impacts[19])[20]. If not, potentially expensive measures may be incorrectly targeted and objectives may not be met.

As part of the characterisation, Member States have defined surface water body types (typology) for each surface water category (i.e. rivers, lakes, transitional waters or coastal waters) in each RBD, and have delineated surface water bodies in accordance with the methodology specified in Annex II of the WFD. This also includes the identification of HMWBs and AWBs. For each surface water body type, type-specific reference conditions have been established representing the values for that surface water body type at high ecological status.

Territorial waters are not a water body category under WFD. However, Article 2.1 of the WFD indicates that chemical status applies to territorial waters as well.

Each water category has to be divided into types based on abiotic descriptors such as altitude, geology, size, etc. using system A or system B as described in Annex II of the WFD. The ecological relevance of the different theoretical types has to be demonstrated by cross-checking them against biological data such as macroinvertebrate groups and/or species composition. This is essential to ensure that the types are relevant and fit for the purpose of allowing the robust classification of ecological status of water bodies. Not all water categories occur in every RBD and/or Sub-unit.

Member States are required to identify the ecological status of water bodies by comparing current status with near natural or reference conditions. Reference conditions have to be established for each of the surface water types. They represent the values for that surface water body type at high ecological status.

According to Annex II of the WFD, reference conditions can be established using different methods (without specific ranking):

- Spatially based reference conditions using data from monitoring sites if sufficient undisturbed or minimally disturbed sites are available.
- When adequate numbers of representative reference sites are not available in a region/type, predictive modelling, using the data available within a region/type or borrowing data from other similar regions/types, can be used in model construction and calibration.
- A combination of the above approaches.
- Where it is not possible to use these methods, reference conditions can be established using expert judgement.

[19] CIS Guidance Document No 3: Analysis of Pressures and Impacts: https://circabc.europa.eu/sd/a/7e01a7e0-9ccb-4f3d-8cec-aeef1335c2f7/Guidance%20No%203%20-%20pressures%20and%20impacts%20-%20IMPRESS%20(WG%202.1).pdf

[20] It is recognised that detailed quantification of pressures is a challenging task in some cases and might not always be possible.

Establishing reference conditions for many quality elements may involve using more than one of the methods described above.

The WFD protects all waters independently of their size, but for operational purposes it defines a water body as a 'discrete and significant' element of water. The water body is the scale at which status is assessed. The thresholds given in Annex II for system A typology have been used as a possibility for differentiating water bodies but this approach should not exclude smaller water bodies from the protection of the Directive. Member States have flexibility to decide not to designate very small water bodies where, due to the large number of water bodies in a RBD, this would result in a high administrative burden. Instead, Member States can aggregate these small water bodies into groups or include them as part of a larger contiguous water body of the same surface water category and of the same type.

Article 6 of the WFD requires Member States to establish a register or registers of all areas lying within each RBD which have been designated as requiring special protection under specific Community legislation for the protection of their surface water and groundwater, or for the conservation of habitats and species directly depending on water. These are known as Protected Areas. Member States should identify and map the protected areas in their RBMPs (Annex VII WFD).

The WFD requires that objectives for protected areas established under Community legislation should also be met.

Article 7 of the WFD requires Member States to establish drinking water protected areas for bodies of groundwater and surface water providing more than 10 m^3 a day as an average or serving more than 50 persons, or for bodies that are intended for that use in the future. The objective for these areas is to avoid deterioration in quality in order to reduce the level of purification treatment required.

2.2.2. How will the European Commission and the EEA use the information reported?

The European Commission will use this information to assess whether and how Member States have implemented the key obligations of the WFD.

With regard to the typology of surface water bodies, the key issues in assessing compliance with the Directive will be identifying whether typology is meaningful for the purpose of establishing a classification system for ecological status, whether the level of typology is comparable (in particular in international RBDs) and whether type-specific reference conditions have been adequately defined.

Statistics and information will be provided to the European Parliament at EU level. Information will be provided to the public through WISE.

For information relating to the typology of surface waters in accordance with the WFD, more detailed guidance and information is provided in the REFCOND (CIS Guidance Document No. 10:

River and Lakes - Typology, Reference Conditions and Classification Systems[21]), COAST (CIS Guidance Document No. 5: Transitional and Coastal Waters - Typology, Reference Conditions and Classification Systems[22]) and water bodies (CIS Guidance Document No. 2: Identification of Water Bodies[23]).

2.2.2.1. Products from reporting

The following products will be produced by the European Commission or the EEA from the data and information reported by Member States.

Nb	Name of product	Type of product	Scale of information*	Detailed information displayed	Source of detailed information and aggregation rule	Used in 2012 reports?
1	**Number and average size of surface water bodies**	Table	EU/MS/ RBD/ SU	Number and size (length/area) of surface water bodies by Category. Total length or total area of surface water bodies by Category. Average size of surface water bodies by Category.	Average: sum of length (rivers) or area (rest) of all surface water bodies divided by the number of surface water bodies. Aggregation on the basis of the information reported at water body level.	Yes
2	**Spatial reference layer of surface water bodies**	Spatial dataset	WB	Mapping of all surface water bodies.	Spatial dataset including all surface water bodies.	Yes
3	**Number of types of surface water bodies**	Table	MS	Number of types of surface water bodies reported by Category.	Count of different types on the basis of the information provided at surface water body level.	Yes
4	**Percentage of HMWBs and AWBs**	Map	RBD/SU	Percentage of HMWBs and AWBs by Category.	Aggregation on the basis of the information reported at water body level.	Yes
5	**Percentage of natural, HMWBs and AWBs**	Chart	MS	Percentage of HMWBs and AWBs by Category.	Aggregation on the basis of the information reported at water body level.	Yes
6	**Natural, heavily modified and artificial water bodies**	Table	MS/ RBD/ SU	Number and size (length/area) of natural water bodies, AWBs and HMWBs by Category.	Aggregation on the basis of the information reported at water body level.	Yes

Notes: * Scale of information: EU = European; MS = National, Member State; RBD = River Basin District; SU = Sub-unit; WB = water body

[21] CIS Guidance Document No. 10: River and lakes - Typology, reference conditions and classification systems: https://circabc.europa.eu/sd/a/dce34c8d-6e3d-469a-a6f3-b733b829b691/Guidance%20No%2010%20-%20references%20conditions%20inland%20waters%20-%20REFCOND%20(WG%202.3).pdf

[22] CIS Guidance Document No. 5: Transitional and Coastal Waters - Typology, Reference Conditions and Classification Systems: https://circabc.europa.eu/sd/a/85912f96-4dca-432e-84d6-a4dded785da5/Guidance%20No%205%20-%20characterisation%20of%20coastal%20waters%20-%20COAST%20(WG%202.4).pdf

[23] CIS Guidance Document No. 2: Identification of Water Bodies: https://circabc.europa.eu/sd/a/655e3e31-3b5d-4053-be19-15bd22b15ba9/Guidance%20No%202%20-%20Identification%20of%20water%20bodies.pdf

2.2.3. Contents of 2016 reporting

2.2.4. Schema sketch

See Annex 10.2.

2.2.4.1. Information and data to be reported using the schemas

Information regarding the delineation and characterisation of surface water bodies should be reported at surface water body level according to the schema SWB.

Schema: SWB
Class: SurfaceWaterBody *Properties: maxOccur: unbounded minOccur: 1*
Schema element: euSurfaceWaterBodyCode Field type / facets / relationship: FeatureUniqueEUCodeType Properties: maxOccurs = 1 minOccurs = 1 Guidance on completion of schema element: Required. Unique EU code of the surface water body. Prefix the surface water body's national, unique code with the Member State's 2-alpha character ISO country code[24]. Quality checks: Element check: EUSurfaceWaterBodyCode must be reported. String length must be within the range of 3 to 42 characters. First 2 characters must be the Member State's 2-alpha character ISO country code. Only one value can be reported. Within-schema check: euSurfaceWaterBodyCode must be unique.
Schema element: euSubUnitCode Field type / facets / relationship: FeatureUniqueEUCodeType Properties: maxOccurs = 1 minOccurs = 0 Guidance on completion of schema element: Conditional. If the RBD has been divided into Sub-units, report the unique EU code of the Sub-unit where the water body is located. Prefix the Sub-unit's national, unique code with the Member State's 2-alpha character ISO country code[24]. Quality checks: Conditional check: report if *RBDSUCA/RBD/*subUnitsDefined is 'Yes'. Element check: String length must be a maximum of 42 characters. First 2 characters must be the Member State's 2-alpha character ISO country code. Only one value can be reported. Cross-schema check: The reported EUSubUnitCode must be consistent with the codes reported in *RBDSUCA/RBD/SubUnit*/euSubUnitCode.
Schema element: surfaceWaterBodyName

[24] Member State's 2-alpha character ISO country code: http://publications.europa.eu/code/en/en-370100.htm (Note: for Greece use 'EL' and United Kingdom use 'UK')

Field type / facets / relationship: String250Type

Properties: maxOccurs = 1 minOccurs = 1

Guidance on completion of schema element: Required. Readily understandable name of the surface water body in English that is meaningful outside of the RBD or Member State. It should include the name of the river, lake, transitional water, coastal water or territorial water in which the surface water body is located.

Schema element: surfaceWaterBodyCategory

Field type / facets / relationship: SWCategoryCode_Enum: RW, LW, TW, CW, TeW

Properties: maxOccurs = 1 minOccurs = 1

Guidance on completion of schema element: Required. Category of surface water body must be reported.

'RW' = River water body.

'LW' = Lake water body.

'TW' = Transitional water body.

'CW' = Coastal water body.

'TeW' = Territorial water body.

Territorial waters are not a water body category under WFD. However, Article 2.1 of the WFD indicates that chemical status applies as well to territorial waters. This option allows Member States to report the relevant information for the part of territorial waters which extend beyond coastal waters. Non-relevant information such as water body type or ecological status does not need to be reported for territorial waters (see the guidance provided for these schema elements).

It is the recommendation of this Guidance that reservoirs formed by damming rivers (i.e. heavily modified rivers) should be reported as river water bodies.See schema element reservoir below.

Schema element: naturalAWBHMWB

Field type / facets / relationship: NaturalCode_Enum:

Natural

Artificial

Heavily Modified

Properties: maxOccur: 1 minOccur: 1

Guidance on completion of schema element: Required. Indicate whether the surface water body is natural or artificial or heavily modified.

Note: a water body cannot be both artificial and heavily modified.

A reservoir may be artificial (e.g. constructed for bankside storage) or heavily modified (e.g. a dammed or impounded river).

A canal may be artificial (e.g. specifically constructed for navigation where there was no surface water body before) or heavily modified (e.g. a river that has been deepened or widened or similarly engineered for navigation).

The identification of the category for artificial water bodies (AWBs) or heavily modified water bodies

(HMWBs) as described in the Category element does not preclude any decision regarding the factors to use in deriving typology and the quality elements to use in the assessment of the AWBs or HMWBs. According to the WFD Annex II, 1.1.v, the typology differentiation should be undertaken in accordance with the descriptors for whichever natural surface water category most closely resembles the AWB or HMWB concerned. Similarly, the quality elements should be those applicable to whichever natural surface water category most closely resembles the AWB or HMWB (WFD Annex V, 1.1.5). This means that reservoirs made by damming rivers may be categorised as heavily modified rivers but should be typified and assessed using the elements and tools for lakes, as lakes is the natural surface water category which reservoirs most closely resemble.

The option "Natural" should be chosen for territorial waters.

Quality checks: The option 'Natural' must be chosen if surfaceWaterBodyCategory is 'TeW'.

Schema element: hmwbWaterUse

Field type / facets / relationship: HMWBWaterUse_Enum:

Agriculture - land drainage,

Agriculture - irrigation,

Energy - hydropower,

Energy - non-hydropower,

Storage for fisheries/aquaculture/fish farms,

Flood protection,

Industry supply,

Tourism and recreation,

Transport - navigation / ports,

Urban development - drinking water supply,

Urban development - other use,

Wider environment - nature protection and other ecological uses,

Other,

Unknown,

Properties: maxOccurs = unbounded minOccurs = 0

Guidance on completion of schema element: Conditional. For HMWBs only, report the water use for which it has been designated.

'Wider environment' can refer to designation in order to maintain nature protected areas and also archaeological sites and patrimony (see CIS Guidance Document No. 4 – Identification and Designation of Heavily Modified and Artificial Water Bodies[25]).

[25] CIS Guidance Document No. 4 – Identification and Designation of Heavily Modified and Artificial Water Bodies: https://circabc.europa.eu/sd/a/f9b057f4-4a91-46a3-b69a-e23b4cada8ef/Guidance%20No%204%20-%20heavily%20modified%20water%20bodies%20-%20HMWB%20(WG%202.2).pdf

Quality checks: Conditional check: Report if naturalAWBHMWB is 'Heavily Modified'.

Schema element: hmwbPhysicalAlteration

Field type / facets / relationship: HMWBPhysicalAlteration_Enum:

Locks

Weirs / dam / reservoir

Channelisation / straightening / bed stabilisation / bank reinforcement

Dredging / channel maintenance

Land reclamation / coastal modifications / ports

Land drainage

Other

Properties: maxOccurs = unbounded mixOccurs: 0

Guidance on completion of schema element: Conditional. For HMWBs only, report the physical alteration that has resulted in the designation of the surface water body as a HMWB. In the context of designation, physical alterations mean any significant alterations that have resulted in substantial changes to the hydromorphology of a surface water body such that the surface water body is substantially changed in character. In general, these hydromorphological characteristics are long-term and alter both the morphological and hydrological characteristics. Further guidance on the terms is found in the Glossary section below.

Quality checks: Conditional check: Report if naturalAWBHMWB is 'Heavily Modified'.

Schema element: reservoir

Field type / facets / relationship: YesNoUnclearReservoir_Enum:

Yes, it is a reservoir and the water body was originally a river

No, it is a reservoir but the water body was originally a lake

Unclear, it is a reservoir but originally included chained rivers and lakes

The water body is not a reservoir

Properties: maxOccurs = 1 mixOccurs: 0

Guidance on completion of schema element: Conditional. For heavily modified river or lake water bodies, indicate whether the water body is a reservoir that has been created by damming a river ('Yes, it is a reservoir and the water body was originally a river') or an existing lake ('No, it is a reservoir but the water body was originally a lake').

It is the recommendation of this Guidance that reservoirs formed by damming rivers should be reported as heavily modified river water bodies.However, Member States may choose to report reservoirs formed by damming rivers as lake water bodies if they wish. The 'reservoir' schema element must be reported so that Member States can clarify the designation.

'Yes, it is a reservoir and the water body was originally a river' = Select only if the whole surface water body represents a reservoir (or part of a reservoir) created by damming a river. (surfaceWaterBodyCategory must be reported as 'RW' and naturalAWBHMWB as 'Heavily Modified').

'No, it is a reservoir but the water body was originally a lake' = Select if the whole surface water body represents a reservoir (or part of a reservoir) created by modifying an existing lake, or if the surface water body includes some small reservoirs which are not significant enough to be identified as separate surface water bodies. (surfaceWaterBodyCategory must be reported as 'LW' and naturalAWBHMWB as 'Heavily Modified'). 'Unclear, it is a reservoir but originally included chained rivers and lakes' = Select in such cases where the reservoir has been created by damming a water body which contained chained rivers and lakes. (surfaceWaterBodyCategory must be reported as 'RW' or 'LW' and naturalAWBHMWB as 'Heavily Modified'). 'The water body is not a reservoir' = Indicates that the river or lake water body is not a reservoir. Quality checks: Conditional check: Report if surfaceWaterBodyCategory is 'RW' or 'LW' AND naturalHeavilyModified is 'Heavily Modified'.
Schema element: surfaceWaterBodyTypeCode Field type / facets / relationship: String100Type Properties: maxOccurs = 1 minOccurs = 1 Guidance on completion of schema element: Required. Member State code for the characterisation type of the surface water body, as reported in the surface water methodology schema (SWMET), and the RBMP and background documents. Report 'Not applicable' for territorial waters. Quality checks: Within-schema check: 'Not applicable' should be reported only if surfaceWaterBodyCategory is 'TeW'. Cross-schema check: The reported surfaceWaterBodyTypeCode must be consistent with the codes reported in *SWMET*/*SWType*/swTypeCode.
Schema element: surfaceWaterBodyIntercalibrationType Field type / facets / relationship: SWIntercalibrationType_Enum (see Annex 8a) Properties: maxOccurs = unbounded minOccurs = 1 Guidance on completion of schema element: Required. If the surface water body type corresponds with an intercalibration type, report the intercalibration type code (not name). The intercalibration type reported in this element must be appropriate to the surface water body's Category. If there is no corresponding intercalibration type, select 'Not applicable'. Report 'Not applicable' for territorial waters. Quality checks: Within-schema check: 'Not applicable' should be reported if SurfaceWaterBodyCategory is 'TeW'. Cross-schema check: SurfaceWaterBodyIntercalibrationType must be consistent with the codes reported in *SWMET/*IntercalibrationType
Schema element: surfaceWaterBodyTransboundary

Field type / facets / relationship: YesNoNotApplicable_Union_Enum: Yes, No, Not applicable **Properties**: maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. The Directive requires coordination among Member States for the management of transboundary Water Bodies. Transboundary water bodies are those crossing the border between countries or constituting part of the border between two countries for a certain length. For reporting purposes in the case of water bodies that cross the border between countries, and for the sake of clarity, each Member State should report on its own part of these trans-boundary Water Bodies. Geographic information should therefore be provided for the part of the Water Body within the reporting Member State and likewise for all elements which have a clear geographical reference (e.g. size, monitoring stations). Each Member State should also report on all elements that apply to the whole water body (status, pressures, etc). For the latter the Commission expects that the information provided by each of the Member States concerned will be identical, as a result of the coordinated management required by the Directive. Similarly, for water bodies which constitute part of the border between two countries the same principles apply. In the case of rivers represented as lines, the same line will have to be reported by both Member States concerned, instead of reporting different but adjacent areas, as is the case, for example, for a lake that extends across the border. Not applicable for territorial waters. **Quality checks**: Within-schema check: ' Not applicable ' should be reported if SurfaceWaterBodyCategory is 'TeW'.
Schema element: swAssociatedProtectedArea **Field type / facets:** YesNoCode_Enum: Yes, No **Properties**: maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether the surface water body is associated to any protected area.

2.2.4.2.GIS information:

GIS information should be reported in GML file format (see Annex 5 for further information) for **all river water bodies**, not just the main rivers as was the case in 2010.

For further information and specifications on the reporting of GIS data, including the reporting of shared water bodies, please refer to Annex 5 (GIS guidance).

2.2.4.3.Guidance on contents of RBMPs/background documents

See SWMET schema for information requested on methodologies for characterisation.

2.2.4.4. Glossary: clarification of terms and reporting requirements

Some Member States which have a large number of surface water bodies with low pressures **group surface water bodies** for the assessment of pressures and status. The information reported for the surface water bodies belonging to a group will therefore be identical.

Further clarification as regards the terms used in relation to physical alterations for HMWB (element hmwbPhysicalAlteration above):

- Locks: device for raising and lowering boats between stretches of water of different levels on river and canal waterways.
- Weirs / dam / reservoir: transversal barrier constructed across a river or a lake discharge for the purpose of creating a water impoundment.
- Channelisation / straightening / bed stabilisation: any permanent modification which longitudinally affects river banks and/or river bed, including changing direction, reducing meandering, stabilisation of river banks, etc.
- Dredging / Channel maintenance: modifications due to regular maintenance of rivers through dredging for any given purpose, usually navigation or flood protection
- Land reclamation / coastal modifications / ports: modification of a water body as a result of the creation of new land from ocean, riverbeds, or lake (e.g. for the purpose of expanding or creating a port).
- Land drainage: modification of a water body as a result of the artificial change to the water level intended to make available existing land for a particular purpose (often for agricultural production or for urbanisation).

2.3. Pressures and impacts on surface waters

2.3.1. Introduction

In the case of surface waters, the WFD requires the identification of **significant pressures** from point sources of pollution, diffuse sources of pollution, modifications of flow regimes through abstractions or regulation and morphological alterations, as well as any other pressures. 'Significant' is interpreted as meaning that the pressure contributes to an **impact** that may result in the failing of Article 4(1) Environmental Objectives (see 'glossary' below for further explanations).

The identification of significant pressures and their resulting impacts (which in turn lead to a reduced status) can involve different approaches: field surveys, inventories, numerical tools (e.g. modelling), expert judgement or a combination of tools. The magnitude of the pressure is usually compared with a threshold or criteria, relevant to the water body category and type, to assess its significance.

Reporting of pressures has to be seen in the context of the WFD planning process. The purpose of the Article 5 pressures and impacts analysis is to identify the water bodies which are at risk of failing to meet the Environmental Objectives of the WFD, either because they will not achieve good status or because their status is at risk of deterioration. Member States may have very comprehensive pressure inventories, but the purpose of reporting is focused on the 'significance' in relation to the WFD Environmental Objectives. Therefore, a pressure or impact should only be reported if it is significant, alone or in combination with others, because it puts the Environmental Objectives at risk. For example, the mere existence of point sources of pollution in a water body is not a reason

to report point sources as a significant pressure. It should only be reported if these point sources put the achievement of the Environmental Objectives in the water body at risk. Significant pressures should only be reported for those water bodies which have been identified as being at risk.

The Article 5 pressures and impacts analysis is a crucial initial step in the planning process. The resulting risk assessment should then be used to design the monitoring programmes. One of the purposes of the monitoring programmes is to validate the risk assessment (see WFD Annex V section 1.3.1). This validation is then expected to feed into the risk assessment of the next planning cycle to refine the definition of 'significance' and improve the results. Indeed, in the first RBMPs, for the first risk assessment, Member States may have used certain pressure thresholds or criteria to define 'significance', but given the scarce impact data available at the time (the monitoring programmes had not yet started) it was not possible to establish a clear link to the impacts in terms of Environmental Objectives. For the second RBMPs, given the significant progress in terms of availability of information on pressures, impacts, responses, monitoring data and status, the pressures and impacts analysis and the risk assessment should have improved considerably, making this important first step of the planning process much more reliable.

This does not mean that the information on pressures and status at water body level should match one to one in all cases. It is expected that some water bodies may have been identified as being 'at risk' but their status is 'good', either because the significant pressures identified are not large enough to cause the water body to be in less than good status in the given local conditions, or because the risk identified is a risk of deterioration. The opposite case (less than good status with no significant pressure) is seldom expected to happen, as the pressures analysis should be driven by a precautionary approach and be thorough enough to capture all potential pressures causing risk.

2.3.2. How will the European Commission and the EEA use the information reported?

The purpose of the collection of the information is to identify the main pressures within the RBD. The summary information will be used to compile maps at a European level of relevant pressures and to ensure that relevant pressures have been identified at RBD level. Statistics and information will be provided to the European Parliament at EU level. Information will be provided to the public through WISE.

2.3.2.1. Products from reporting

Note: for all relevant products, information on surface water bodies will be presented by number of surface water bodies and by size (length or area) as well as percentage.

Nb	Name of product	Type of product	Scale of information*	Detailed information displayed	Source of detailed information and aggregation rule	Used in 2012 reports?*
1	**Percentage of surface water bodies of each Category affected by significant pressures of each type**	Map	RBD/SU	Percentage of surface water bodies by Category subject to significant pressures of each type (point, diffuse, hydromorphological, etc).	Aggregation on the basis of the information on pressures provided at water body level	Yes

Nb	Name of product	Type of product	Scale of information*	Detailed information displayed	Source of detailed information and aggregation rule	Used in 2012 reports?*
2	Aggregation tables: Significant pressures affecting surface water bodies by number, size and category	Table	MS/ RBD/ SU	Number and size (length/area) of surface water bodies affected by significant pressures, by Category.	Aggregation on the basis of the information reported at water body level	Yes
3	Aggregation tables: Significant pressures affecting surface water bodies by number and percentage	Table	MS/ RBD/ SU	Number and percentage of surface water bodies affected by significant pressures.	Aggregation on the basis of the information reported at water body level	Yes
4	Proportion of total number of classified surface water bodies with identified significant pressures, by Category	Chart	EU	Percentage of classified surface water bodies affected by significant pressures, by Category.	Aggregation on the basis of the information reported at water body level – water bodies with unknown status not included.	Yes
5	Proportion of river water bodies affected by diffuse and hydromorphological pressures in different Member States	Chart	MS	Proportion of river water bodies affected by diffuse and hydromorphological pressures.	Aggregation on the basis of the information reported at water body level – water bodies with unknown status not included.	Yes
6	Proportion of lake water bodies affected by diffuse and hydromorphological pressures in different Member States	Chart	MS	Proportion of lake water bodies affected by diffuse and hydromorphological pressures.	Aggregation on the basis of the information reported at water body level – water bodies with unknown status not included.	Yes
7	Proportion of transitional, coastal and territorial water bodies affected by diffuse and hydromorphological pressures in different Member States	Chart	MS	Proportion of transitional, coastal and territorial water bodies affected by diffuse and hydromorphological pressures.	Aggregation on the basis of the information reported at water body level – water bodies with unknown status not included.	Yes
8	Pollution / hydromorphological pressures of classified river water bodies, according to population density and percentage of arable land in the river basin	Chart	EU	River basins grouped according to population density and percentage of arable land (five groups each). Pollution and hydromorphological pressures of all river water bodies in the groups aggregated. Proportion of river water bodies affected by the two pressures are presented.	Aggregation on the basis of the information reported at water body level supplemented with information on population and land use in the RBDs – water bodies with unknown status not included.	Yes

Nb	Name of product	Type of product	Scale of information*	Detailed information displayed	Source of detailed information and aggregation rule	Used in 2012 reports?*
9	Pollution / hydromorphological pressures of classified river water bodies, according to population density and percentage of arable land	Chart	EU	Water bodies have been grouped according to population density and percentage of arable land (five groups each). Pollution and hydromorphological pressures of all river water bodies in the groups aggregated. Proportion of river water bodies affected by the two pressures are presented.	Aggregation on the basis of the information reported at water body level supplemented with information on population and land use per water body.	It was not possible to produce (no information on population and land use was available at water body level).
10	Aggregation tables: Impacts affecting surface water bodies	Table	MS/ RBD/ SU	Number and size (length/area) of surface water bodies affected by impacts, by Category.	Aggregation on the basis of the information reported at water body level.	Yes
11	Proportion of total number of classified surface water bodies with identified impacts, for (a) rivers, (b) lakes, (c) coastal waters, (d) transitional waters, and (e) territorial waters	Chart	EU	Percentage of surface water bodies affected by significant impacts, by Category.	Aggregation on the basis of the information reported at water body level – water bodies with unknown status not included.	Yes
12	Drivers responsible for failure of good status	Table	RBD/SU	Number of water bodies failing good status due to each driver. Percentage of water bodies failing good status due to each driver in relation to total number of water bodies failing good status (total and by Category).	Aggregation on the basis of the information on pressures provided at water body level.	It was not possible to produce (drivers were not reported unless linked to pressures reported at detailed level, which was optional).

Notes: * Scale of information: EU = European; MS = National, Member State; RBD = River Basin District; SU = Sub-unit; WB = water body

2.3.3. Contents of 2016 reporting

2.3.3.1. Schema sketch

See Annex 10.2.

2.3.3.2. Information and data to be reported using the schemas

Information regarding the pressures and impacts on surface water bodies should be reported at surface water body level according to the schema SWB.

Schema: SWB (continued)
Class: SurfaceWaterBody (continued)

Properties: *maxOccur: unbounded minOccur: 1*
Schema element: swSignificantPressureType Field type / facets: SignificantPressureType_Enum (see Annex 1a) Properties: maxOccurs =unbounded minOccurs = 1 Guidance on completion of schema element: Required. Indicate the significant pressure type(s) from the enumeration list. If a combination of pressure-driver is not significant on its own but it is in combination with others, select all the relevant pressures of that type that are present which make the overall pressure significant (e.g. if abstraction from industry or agriculture is not relevant on their own but they are relevant in combination, select both). If the ecological status or potential of the surface water body is less than good, at least one significant pressure type must be reported. The option 'No significant pressure' is not valid. If the chemical status of the surface water body is less than good, at least one significant pressure type must be reported. The option 'No significant pressure' is not valid. Quality checks: Within-schema check: the option 'No significant pressure' is not compatible with any other. Within-schema check: the option 'Not applicable' is not compatible with any other option and can be selected if and only if surfaceWaterBodyCategory is 'TeW' (not compatible with any other surfaceWaterBodyCategory). Within-schema check: If SWB/SurfaceWaterBody/swEcologicalStatusOrPotentialValue is '3', '4' or '5', at least one significant pressure type must be selected from the enumeration list (can include option '8 Unknown pressures'). The option 'No significant pressure' is not a valid selection. Within-schema check: If SWB/SurfaceWaterBody/swChemicalStatusValue is '3', at least one significant pressure type must be selected from the enumeration list (can include '8 Unknown pressures'). The option 'No significant pressure' is not a valid selection.
Schema element: swSignificantPressureOther Field type / facets: String1000Type Properties: maxOccurs =1 minOccurs = 0 Guidance on completion of schema element: Conditional. If '7 – Anthropogenic pressure – Other' is selected from the enumeration list and reported under swSignificantPressureType, provide details of any other anthropogenic pressure types which are relevant in this element. This element should only be reported if the pressure type is not included in the enumeration list under swSignificantPressureType. Quality checks: Conditional check: Report if '7 – Anthropogenic pressure - Other' is selected from the enumeration list under swSignificantPressureType.
Schema element: swSignificantImpactType Field type / facets: SignificantImpactType_Enum (see Annex 1b) Properties: maxOccurs =unbounded minOccurs = 1 Guidance on completion of schema element: Required. Indicate the impact type(s) from the

enumeration list. If the ecological status or potential of the surface water body is less than good, at least one significant impact type or the option 'UNKN - Unknown impact type' must be reported. The option 'NOSI - No significant impact' is not valid. If the chemical status of the surface water body is less than good, at least one significant impact type or the option 'UNKN - Unknown impact type' must be reported. The option 'NOSI - No significant impact' is not valid. Quality checks: Within-schema check: the option 'NOSI - No significant impact' is not compatible with any other. Within-schema check: the option ' NOTA - Not applicable' is not compatible with any other option and must be selected if and only if surfaceWaterBodyCategory is 'TeW' (not compatible with any other surfaceWaterBodyCategory). Within-schema check: If SWB/SWEcologicalStatus/SwEcologicalStatusOrPotentialValue is '3', '4' or '5', at least one significant impact type or the option 'UNKN - Unknown impact type' must be selected from the enumeration list . The option 'NOSI - No significant impact' is not a valid selection. Within-schema check: If SWB/SurfaceWaterBody/swChemicalStatusValue is '3', at least one significant impact type or the option 'UNKN - Unknown impact type' must be selected from the enumeration list. The option 'NOSI - No significant impact' is not a valid selection.
Schema element: swSignificantImpactOther Field type / facets: String1000Type Properties: maxOccurs =1 minOccurs = 0 Guidance on completion of schema element: Conditional. If ' OTHE - Other significant impact type' is selected from the enumeration list under swSignificantImpactType, provide details of any other impact types which are relevant in this element. This element should only be reported if the impact type is not included in the enumeration list under swSignificantImpactType. Quality checks: Conditional check: Report if ' OTHE - Other significant impact type' is selected from the enumeration list under swSignificantImpactType

2.3.3.3. Guidance on contents of RBMPs/background documents

See SWMET schema for information requested on methodologies for pressure and impact analysis.

2.3.3.4. Glossary: clarification of terms and reporting requirements

Some Member States which have large number of water bodies with low pressures may **group water bodies** for the assessment of pressures and status. The information reported for the water bodies belonging to a group will therefore be identical.

'Significant Pressures' are those pressures which, either alone, or in combination with other pressures prevent or put at risk the achievement of WFD Article 4(1) Environmental Objectives including the achievement of good status, the non-deterioration of status, the avoidance of a

significant and sustained upward trend in pollution of groundwater, and the achievement of objectives in WFD protected areas. This means that for the second RBMPs, all water bodies which are below good status and are not expected to achieve good status in 2015 are at risk and Member States are expected to identify significant pressures for them.

Pressures may combine to cause water bodies to be failing, or to be at risk of failing, WFD Environmental Objectives. For example, a point source discharge may not present a risk on its own, but when combined with a reduction in flow will have an impact on a water body. In that case, both pressures (point source and abstraction) should be identified as significant. The same happens when there are different pressures of the same type but caused by different drivers. For example abstraction for drinking water supply and for industry in a particular water body may not be significant on their own, but if they are when combined, they should be identified as significant.

2.4. Ecological status and exemptions

2.4.1. Introduction

The WFD defines its Environmental Objectives in Article 4 and sets the aim for long term sustainable water management. Article 4(1) defines the WFD's general objective to be achieved in all surface and groundwater bodies, i.e. good status (for natural water bodies) or potential (for Artificial or Heavily Modified Water Bodies) by 2015, and introduces the principle of preventing any further deterioration of status. A number of exemptions to the general objectives are possible under certain conditions.

- Article 4(4) allows for an extension of the deadline beyond 2015.
- Article 4(5) allows for the achievement of less stringent objectives.
- Article 4(6) allows a temporary deterioration in the status of water bodies.
- Article 4(7) sets out conditions in which deterioration of status or failure to achieve certain of the WFD Environmental Objectives may be permitted for new modifications to the physical characteristics of surface water bodies, and deterioration from high to good status may be possible as a result of new sustainable human development activities.

The WFD provides the general framework on exemptions but there is scope for differences in understanding and implementation. From the outset of implementation, it was clear that the use of exemptions needed to be explained further and the rules for application had to be made clearer. These clarifications can be found in the CIS Guidance Document No. 20: Exemptions to the Environmental Objectives[26] published in 2009.

Annex V of the WFD specifies how Member States are to monitor and present overall 'status' classification for each of their water bodies in all water categories, as well as the status for each of the Biological Quality Elements (BQEs) / Quality Elements (QEs) used.

[26] CIS Guidance Document No. 20: Exemptions to the Environmental Objectives: https://circabc.europa.eu/sd/a/2a3ec00a-d0e6-405f-bf66-60e212555db1/Guidance_documentN%C2%B020_Mars09.pdf

2.4.2. How will the European Commission and the EEA use the information reported?

Information on the status of water bodies is the basic indicator which informs whether the implementation of the WFD is successful. The majority of the data and information reported by Member States will be used for visualisation in maps, graphs and charts and for providing information to the public through WISE. Furthermore, the data and maps will provide a comparison of current status with the baseline status reported in the first RBMPs (e.g. answering the question, has the ecological status improved since the Programme of Measures required by the WFD was implemented?). This means that the requested data and maps will be essential for trend analyses, for policy development and for the assessment of policy effectiveness.

Statistics and information will be provided to the European Parliament at EU level. Information will be provided to the public through WISE.

2.4.2.1. Products from reporting

Note: for all relevant products, information on surface water bodies will be presented by number of surface water bodies and by size (length or area) as well as percentage.

Nb	Name of product	Type of product	Scale of information*	Detailed information displayed	Source of detailed information and aggregation rule	Used in 2012 reports?*
1	Number and percentage of surface water bodies of high or good status and expected improvement	Table	WB	Number and percentage of surface water bodies of high or good ecological status or potential and expected improvement. Number and percentage of surface water bodies of good chemical status and expected improvement.	Aggregation on the basis of the information provided at water body level,	Yes
2	Surface water bodies of good ecological status and use of exemptions	Chart	MS	Percentage of surface water bodies currently of good or better ecological status or potential. Percentage of surface water bodies of unknown status. Percentage of surface water bodies in which exemptions are applied.	Aggregation on the basis of the information reported at water body level.	Yes
3	Percentage of surface water bodies of less than good ecological status	Map	RBD	Proportion of classified surface water bodies of less than good ecological status or potential, by Category.	Aggregation on the basis of the information reported at water body level.	Yes
4	Percentage of surface water bodies of unknown status	Table	MS/RBD	Proportion of classified surface water bodies of unknown status.		No

Nb	Name of product	Type of product	Scale of information*	Detailed information displayed	Source of detailed information and aggregation rule	Used in 2012 reports?*
5	River Basin Specific Pollutants (RBSPs) monitored and RBSPs causing failure of good ecological status, with EQS	Table	MS	RBSPs monitored and RBSPs causing failure of good ecological status, with EQS.	Aggregation of information reported at RBD level.	It was not possible to produce (necessary information was not included in reporting requirements)
6	Percentage of failure of good ecological status attributable to RBSPs	Chart	MS	Percentage of failure of good ecological status attributable to RBSPs.	Aggregation of information reported at water body level.	It was not possible to produce (necessary information was not included in reporting requirements)
7	Aggregation tables: Ecological status of surface water bodies	Table	MS/ RBD/SU	Number and size (length/area) of surface water bodies by ecological status or potential class, by Category.	Aggregation on the basis of the information reported at water body level.	Yes
8	Distribution of ecological status or potential of classified rivers, lakes, transitional and coastal	Chart	EU	Percentage of surface water bodies by ecological status or potential class, by Category.	Aggregation on the basis of the information reported at water body level – water bodies with unknown status not included.	Yes
9	Ecological status or potential of classified river water bodies	Chart	MS	Percentage of river water bodies by ecological status or potential class.	Aggregation on the basis of the information reported at water body level – water bodies with unknown status not included.	Yes
10	Ecological status or potential of classified lake water bodies	Chart	MS	Percentage of lake water bodies by ecological status or potential class.	Aggregation on the basis of the information reported at water body level – water bodies with unknown status not included.	Yes
11	Ecological status or potential of classified transitional and coastal water bodies	Chart	MS	Percentage of transitional and coastal water bodies by ecological status or potential class.	Aggregation on the basis of the information reported at water body level – water bodies with unknown status not included.	Yes
12	Ecological status/potential of classified river water bodies, according to population density and percentage of arable land in the river basin	Chart	EU	River basins grouped according to population density and percentage of arable land (five groups each). Ecological status or potential of all river water bodies in the groups aggregated. Proportion presented by class.	Aggregation on the basis of the information reported at water body level supplemented with information on population and land use in the RBDs – water bodies with unknown status not included.	Yes

Nb	Name of product	Type of product	Scale of information*	Detailed information displayed	Source of detailed information and aggregation rule	Used in 2012 reports?*
13	Ecological status/potential of classified river water bodies, according to population density and percentage of arable land	Chart	EU	Water bodies grouped according to population density and percentage of arable land (five groups each). Ecological status or potential of all river water bodies in the groups aggregated. Proportion presented by class	Aggregation on the basis of the information reported at water body level supplemented with information on population and land use per water body.	It was not possible to produce (no information on population and land use was available at water body level).
14	Aggregation tables: Ecological and chemical status of surface water bodies	Table	MS/ RBD/ SU	Number and size (length/area) of chemical status of surface water bodies, by Category.	Aggregation on the basis of the information reported at water body level.	Yes
15	Ecological status/potential of classified surface water bodies, according to broad water types	Chart	EU/MS/RBD	Surface water bodies grouped according to broad water types. Ecological status or potential of all river water bodies in the groups aggregated. Proportion presented by class.	Aggregation on the basis of the information reported at water body level supplemented with information on population and land use per water body.	It was not possible to produce (too many national types and no detailed information on typology available)
16	Trend in median (a) total ammonium, (b) total phosphorus and (c) nitrate concentrations of river water bodies, grouped by ecological status/potential class	Chart	EU	WFD water body data linked with WISE-SoE long time series data on water quality in rivers ((a) total ammonium, (b) total phosphorus and (c) nitrate concentrations). Trend in water quality presented for each class extrapolated to 2027 to illustrate whether water bodies in moderate to poor ecological status or potential are approaching high to good ecological status or potential.	Aggregation on the basis of the information reported at water body level combined with information on river water quality from the WISE-SoE database.	Yes
17	Progress in achieving good status since the first RBMP	Map/ Chart	MS/ RBD/SU	Percentage of water bodies which have achieved good ecological status or potential since the first RBMP.	Aggregation on the basis of the information reported at water body level.	Not relevant in 2010 reporting
18	Progress towards achievement of good status since the first RBMP by quality element	Map/ Chart	MS/ RBD/ SU	Percentage of surface water bodies which have improved ecological status or potential since the first RBMP by quality element.	Aggregation on the basis of the information reported at water body level.	Not relevant in 2010 reporting
19	Reasons behind WFD Article 4(4) exemptions	Chart	MS	Exemptions reported by Member States to extend the deadline of the achievement of good status beyond 2015 and reasons given (natural condition, technical feasibility, disproportionate costs or combinations).	Aggregation on the basis of the information reported at water body level.	Yes

Nb	Name of product	Type of product	Scale of information*	Detailed information displayed	Source of detailed information and aggregation rule	Used in 2012 reports?*
20	**Percentage of surface water bodies of good ecological status in 2015**	Map/ Chart/ Table	EU/MS/RBD/SU	Percentage of surface water bodies of good ecological status or potential in 2015, aggregated for all surface waters, by Category.	Aggregation on the basis of the information reported at water body level.	No

Notes: * Scale of information: EU = European; MS = National, Member State; RBD = River Basin District; SU = Sub-unit; WB = water body

2.4.3. Contents of the 2016 reporting

2.4.3.1. Schema sketch

See Annex 10.2.

2.4.3.2. Information and data to be reported using the schemas

General guidance for QEs:

Reporting of the status assessment of Quality Elements (QEs) is expected not only where monitoring results are available for specific water bodies but also for all water bodies for which this information is available (e.g. through grouping or extrapolation). A status value should, therefore, be given for each of the relevant QEs that have been assessed for the water body and subsequently used to classify the ecological status or potential of the water body.

If the status of QEs is not reported then it is assumed that it is not used in the classification of the ecological status of the water body.

Information regarding the ecological status of surface water bodies should be reported at surface water body level according to the schema SWB.

Schema: SWB (continued)
Class: SurfaceWaterBody (continued) *Properties: maxOccur: unbounded minOccur: 1*
Schema element: swEcologicalStatusOrPotentialValue **Field type / facets:** EcologicalStatusCode_Enum: 1, 2, 3, 4, 5, Unknown, Not applicable **Properties**: maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate the ecological status or potential of the surface water body, based on the most recently assessed status of the surface water body. '1' = High status or maximum potential. '2' = Good status or potential. '3' = Moderate status or potential. '4' = Poor status or potential. '5' = Bad status or potential.

‘Unknown’ = Unknown status or potential. ‘Not applicable’ = Not applicable (for territorial waters only). Quality checks: Within-schema check: if surfaceWaterBodyCategory is 'TeW' then 'Not applicable' must be selected.
Schema element: swEcologicalAssessmentYear Field type / facets: YearRangeType Properties: maxOccurs =1 minOccurs = 1 Guidance on completion of schema element: Required. Provide the year on which the assessment of status or potential is based. This may be the year that the surface water body was monitored. In case of grouping this may be the year in which monitoring took place in the surface water bodies within a group that are used to extrapolate results to non-monitored surface water bodies within the same group. A period is possible (e.g. 2011--2013). Quality checks: Within-schema check: if surfaceWaterBodyCategory is 'TeW' then '0000' must be reported.
Schema element: swEcologicalAssessmentConfidence Field type / facets: Confidence_Enum: 0, 1, 2, 3 Properties: maxOccurs =1 minOccurs = 1 Guidance on completion of schema element: Required. Indicate the confidence on the ecological status or potential assigned, ‘0’ = No information. ‘1’ = Low confidence. ‘2’ = Medium confidence. ‘3’ = High confidence. The criteria used by Member States to assess confidence vary considerably, but general guidance may be: Low = no monitoring data; Medium = supporting QE data and/or limited data on one BQE; High = good data for at least one BQE and the most relevant supporting QE. In case surfaceWaterBodyCategory is 'TeW', '0' should be selected and interpreted as 'Not applicable'.
Schema element: swEcologicalStatusOrPotentialExpectedGoodIn2015 Field type / facets: YesNoNotApplicable_Union_Enum: Yes, No, Not applicable Properties: maxOccurs =1 minOccurs = 1 Guidance on completion of schema element: Required. Indicate whether it is expected that this surface water body will achieve good (or better) ecological status or potential by the end of 2015. This may differ from the data reported under swEcologicalStatusOrPotentialValue 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. The methodology of this assessment should be clearly explained in the

RBMP or background documents (reference reported under classification methodologies (see Section 7.3)).

If an Article 4(4) or 4(5) exemption for ecological status is applied then 'No' should be selected.

'Not applicable' is only valid in case SurfaceWaterCategory is 'TeW'.

Quality checks: Within-schema check: If swEcologicalExemptionType is 'Article 4(4)…' or 'Article 4(5)…' , the option 'No' must be selected from the enumeration list. All other options are not valid selections.

Within-schema check: if surfaceWaterBodyCategory is 'TeW' then 'Not applicable' must be selected.

Schema element: swEcologicalStatusOrPotentialExpectedAchievementDate

Field type / facets: GoodStatus_Enum:

2016--2021

2022--2027

Beyond 2027

Unknown

Less stringent objectives already achieved

Properties: maxOccurs =1 minOccurs = 0

Guidance on completion of schema element: Conditional. If good ecological status or potential will NOT be achieved by 2015 (swEcologicalStatusOrPotentialExpectedGoodIn2015 is No), report the date by which it is expected that it will be achieved in full. The methodology of this assessment should be clearly explained in the RBMP or background documents (reference reported under classification methodologies). If good ecological status or potential will not be achieved by 2015, exemptions should be applied. Please report the date by which it is expected that good ecological status or potential will be achieved in full, not the date relating to individual exemptions. However, please note the following:

Article 4(4) exemptions relate to the extension of deadlines. According to Article 4(4)c of the WFD, postponing the achievement of objectives beyond 2027 is only possible due to natural conditions.

If Article 4(5) exemptions apply, report the date by when the less stringent objective is to be achieved. If the less stringent objective has already been achieved then select 'Less stringent objectives already achieved'. If good ecological status or potential will be achived by 2015 (swEcologicalStatusOrPotentialExpectedGoodIn2015 is Yes) this element should not be reported.

This element should not be reported if surfaceWaterBodyCategory is 'TeW' (territorial waters).

Quality checks: Conditional check: Report if swEcologicalStatusOrPotentialExpectedGoodIn2015 is 'No'. Within-schema check: 'Less stringent objectives already achieved' is only a valid entry if 'Article 4(5)…' is reported under swEcologicalExemptionType.

The following class (child of SurfaceWaterBody) is used to report RBSPs for which the status or potential is less than good:

Schema: SWB (continued)

Class: FailingRBSP *Properties: maxOccur: unbounded minOccur: 0*
Schema element: swFailingRBSP Field type / facets: RBSP_Enum (see Annex 8b) Properties: maxOccurs =1 minOccurs = 1 Guidance on completion of schema element: Required[27]. If the status or potential of QE 3-3 River Basin Specific Pollutants is less than good (as reported in class QualityElement, see below), select the code and name of the RBSP. The RBSPs selected from the enumeration list must be included in the methodology schema (SWMET/SWRBSP/rbsp) where details of all RBSPs' good-moderate EQS are reported, i.e. the RBSPs reported in this element are those that are failing their associated good-moderate EQS in this surface water body. Quality checks: Conditional check: Report if, in Class 'QualityElement', qeStatusOrPotentialValue='3' when qeCode='QE3-3 - River Basin Specific Pollutants'. Cross-schema check: The selected RBSPs must be consistent with the values reported in SWMET/SWRBSP/rbsp
Schema element: swFailingRBSPOther Field type / facets: String100Type Properties: maxOccurs = 1 minOccurs = 0 Guidance on completion of schema element: Conditional. Report CAS number and name of the RBSP failing if not on the enumeration list under swFailingRBSP. Quality checks: Conditional check: report at least 1 if 'EEA_00-00-0 - Other chemical parameter' is chosen under 'swFailingRBSP'.

The following class (child of SurfaceWaterBody) is used to report exemptions at water body level at global ecological status level:

Schema: SWB (continued)
Class: SWEcologicalExemptionType *Properties; max Occur: unbounded minOccur: 1*
Schema element: swEcologicalExemptionType Field type / facets / relationship: ExemptionType_Enum (see Annex 8g) Properties: maxOccurs =1 minOccurs = 1 Guidance on completion of schema element: Required. Report which type(s) of exemption(s) apply if

[27] Please note that the multiplicity of the Class FailingRBSP is 0 to many. Therefore, if there are no RBSPs failing , this whole class does not need to be reported.

good ecological status or potential is not expected to be achieved by 2015. More than one exemption may apply to a surface water body. In case surfaceWaterCategory is 'TeW', 'No exemption' should be reported and interpreted as 'Not applicable'. Quality checks: Within-schema check: 'No exemption' is not compatible with any other option. Within-schema check: If swEcologicalStatusOrPotentialExpectedGoodIn2015 is 'No' then the option 'No exemption' is not possible. One or more of the other options must be selected. Within-schema check: if surfaceWaterCategory is 'TeW' then 'No exemption' must be selected.
Schema element: swEcologicalExemptionPressure Field type / facets / relationship: SignificantPressureType_Enum (see Annex 1a) Properties: maxOccurs =unbounded minOccurs = 0 Guidance on completion of schema element: Conditional. If any Article 4(4), Article 4(5) and/or Article 4(7) exemptions apply to this surface water body for ecological status, report the significant pressure(s) that are causing failure in order to justify the exemption(s). Quality checks: Conditional check: If swEcologicalExemptionType is not 'No exemption', at least one significant pressure type must be selected from the enumeration list (the options 'No significant pressure' and 'Not applicable' are not valid).

Reporting of information for each Quality Element

The following class (child of SurfaceWaterBody) is used to report status and exemptions of the 19 individual quality elements. For each quality element, the following information should be reported. The information should be reported for all surface water categories (rivers, lakes, transitional and coastal waters).

Schema: SWB (continued)
Class: QualityElement *Properties: maxOccurs = 19 minOccurs = 19*
Schema element: qeCode Field type / facets: StatusQE_Enum (see Annex 8h) Properties: maxOccurs = 1 minOccurs = 1 Guidance on completion of schema element: Required. Select in turn each of the quality elements once and provide the associated information. Quality checks: Information for all quality elements should be provided. Each quality element should be chosen only once
Schema element: qeStatusOrPotentialValue

Field type / facets: QEStatusCode_Enum: 1, 2, 3, 4, 5, MonitoredButNotUsed, Unknown, Not applicable

Properties: maxOccurs = 1 minOccurs = 1

Guidance on completion of schema element: Required. Indicate the results of the assessment of this QE for all relevant surface water categories.

‘1’ = High status or maximum potential.

‘2’ = Good status or potential.

‘3’ = Moderate status or potential (for QE1) or less than good status or potential (for QE2 and QE3).

‘4’ = Poor status or potential (this option is only valid for quality elements starting with QE1).

‘5’ = Bad status or potential (this option is only valid for quality elements starting with QE1).

‘MonitoredButNotUsed’ = Monitored but no standard has been developed and/or the QE is not used for status assessment (this option is only valid for quality elements starting with QE2 or QE3).

‘Unknown’ = Unknown status or potential.

‘Not applicable’ = Not applicable

If there is no monitoring information for this QE and/or status is unknown then select ' Unknown' from the enumeration list. If the QE is not applicable in the surface water category or type then select option ‘Not applicable’ from the enumeration list.

Quality checks:

Within-schema check: if surfaceWaterCategory is 'TeW' then 'Not applicable' must be selected.

If qeCode is any quality element starting with QE1, the option ‘MonitoredButNotUsed’ is not valid. If qeCode is any quality element starting with QE2 or QE3, the options ‘4’ and ‘5’ are not valid.

Schema element: qeMonitoringResults

Field type / facets: MonitoringResults_Enum: Monitoring, Grouping, Expert judgement

Properties: maxOccurs = 1 minOccurs = 0

Guidance on completion of schema element: Conditional. If the status is reported, indicate on what basis the status classification was derived:

'Monitoring': means the QE was monitored in this surface water body and the results are used as a basis for classification.

‘Grouping’: the QE was not monitored in this surface water body. Monitoring from other similar water bodies was used as a basis for classification, as described in the methodology for classification.

'Expert judgement': the QE was not monitored in this surface water body. Results from other similar water bodies were not used. The QE status is mainly based on expert judgement.

Quality checks: Conditional check: Report if element qeStatusOrPotentialValue is ‘1’, ‘2’, ‘3’, ‘4’ or ‘5’ (i.e. not ‘MonitoredButNotUsed’, ‘Unknown’, ‘Not applicable’).

Schema element: qeMonitoringPeriod

Field type / facets: YearRangeType

Properties: maxOccurs = 1 minOccurs = 0

Guidance on completion of schema element: Conditional. If the QE was monitored and the classification was derived from the monitoring data available, indicate the year/period of the monitoring data which was used in the classification.

Quality checks: Conditional check: Report if qeMonitoringResults is 'Monitoring'.

Schema element: qeGrouping

Field type / facets: FeatureUniqueEUCodeType

Properties: maxOccurs = unbounded minOccurs = 0

Guidance on completion of schema element: Conditional. If no monitoring data is available for this surface water body and status has been derived through grouping by extrapolating monitoring data from other surface water bodies, indicate the codes of the surface water bodies which have been monitored and used in grouping.

For example, if the status of surface water body A has been determined by extrapolating monitoring data from surface water bodies B and C, then the euSurfaceWaterBodyCode for surface water bodies B and C should be reported in this element.

Quality checks:

Conditional check: Report if qeMonitoringResults is 'Grouping'.

Within-schema check: euSurfaceWaterBodyCode reported in qeGrouping must be consistent with codes reported in SWB/SWCharacterisation/euSurfaceWaterBodyCode.

Schema element: qeStatusOrPotentialChange

Field type / facets: ValueQEX_StatusOrPotentialChange_Enum: +2, +1, 0, -1, -2, Unknown2010, No information

Properties: maxOccurs = 1 minOccurs = 1

Guidance on completion of schema element: Required. If the information is available and if there has been a change in classification since the first RBMP was reported, report that change. Otherwise, report 'No_information'. This covers all cases in which it is not possible to identify a change between 2010 and 2016, for example, new Water Bodies, for which there is no correspondence in the 2010 reporting or new reporting (as is the case for Norway):

'+2' = Improvement by 2 or more classifications.

'+1' = Improvement by 1 classification.

'0' = No change of classification (select as the default).

'-1' = Deterioration by 1 classification.

'-2' = Deterioration by 2 or more classifications.

'Unknown2010' = Status or potential was unknown in 2010.

'No information' = No information available and/or impossible to compare current status or potential with status or potential in 2010.

Schema element: qeStatusOrPotentialComparability

Field type / facets: SoPComparability_Enum:

Consistent change Inconsistent due to changes to monitoring Inconsistent due to changes to assessment methods Inconsistent due to changes to monitoring and assessment methods No information or unknown **Properties:** maxOccurs = 1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. If there has been a change in classification since the first RBMP was reported, indicate whether the reported change in status or potential is considered as being/due to: 'Consistent change' = A real change of status due to measures or due to increased/decreased pressures. 'Inconsistent due to changes to monitoring' = A significant change in monitoring (site, methodology) since the first RBMPs. 'Inconsistent due to changes to assessment methods' = A significant change in the assessment method since the first RBMPs. 'Inconsistent due to changes to monitoring and assessment methods' = A significant change in monitoring (site, methodology) and the assessment method since the first RBMPs. The default value to select should be 'Consistent change'. **Quality checks** Conditional check: Report if qeStatusOrPotentialChange is '+2', '+1', '-1' or '-2'.
Schema element: qeEcologicalExemptionType **Field type / facets:** ExemptionType_Enum (see Annex 8g) **Properties:** maxOccurs = unbounded minOccurs = 1 **Guidance on completion of schema element**: Required. Report which type(s) of exemption(s) apply to this surface water body and QE. More than one exemption may apply. If surfaceWaterCategory is 'TeW' then 'No exemption' must be selected, which should be interpreted as 'Not applicable'. **Quality check**: Within-schema check: the option 'No exemption' is not compatible with any other. If surfaceWaterCategory is 'TeW' then 'No exemption' must be selected.

2.5. Chemical status of surface waters, exemptions and Mixing Zones

2.5.1. Introduction

'Good surface water chemical status' means the chemical status required to meet the Environmental Objectives for surface waters established in Article 4(1)(a) of the WFD, that is the chemical status achieved by a body of surface water in which concentrations of pollutants do not

exceed the environmental quality standards (EQS) established in Annex IX and under Article 16(7), and under other relevant Community legislation setting EQS at Community level. It should be noted that under Article 2(1) of the WFD, territorial waters are included for the assessment and reporting of chemical status.

Decision 2455/2001/EC[28] of the European Parliament and of the Council of 20 November 2001 established the list of Priority Substances in the field of water policy. The Decision identified the substances for which EQS were to be set at Community level which was implemented by means of Directive 2008/105/EC[29] (the EQS Directive (EQSD)). Eight other pollutants that were regulated by Directive 76/464/EEC[30] were also incorporated into the assessment of chemical status.

The EQSD includes a number of other obligations relating to Priority Substances, in particular the trend monitoring of certain Priority Substances in sediment or biota (Article 3(3) EQSD) and the establishment of an inventory of emissions, discharges and losses (Article 5 EQSD, see also Section 9.2).

Directive 2009/90/EC[31] (the QA/QC Directive) on the quality and comparability of chemical monitoring specifies minimum performance criteria to ensure the quality of the analytical results. The deadline for transposition of the QA/QC Directive into national legislation was 21 August 2009, just before the adoption of the first RBMPs.

Directive 2013/39/EU[32], amending the WFD and EQSD as regards Priority Substances, was adopted on 12 August 2013. The revised EQSs for existing Priority Substances should be taken into account for the first time in RBMPs covering the period 2015 to 2021. The newly identified Priority Substances and their EQSs should be taken into account in the establishment of supplementary monitoring programmes and in preliminary Programmes of Measures to be reported by Member States by the end of 2018.

With the aim of achieving good surface water chemical status, the revised EQSs for existing Priority Substances should be met by the end of 2021 and the EQSs for newly identified Priority Substances by the end of 2027. This is without prejudice to Article 4(4) to (9) of the WFD, which includes inter alia provisions for extending the deadline for achieving good surface water chemical status or achieving less stringent Environmental Objectives for specific bodies of water on the grounds of

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[28] Decision No 2455/2001/EC of the European Parliament and of the Council of 20 November 2001 establishing the list of priority substances in the field of water policy and amending Directive 2000/60/EC

[29] Directive 2008/105/EC of the European Parliament and of the Council of 16 December 2008 on environmental quality standards in the field of water policy, amending and subsequently repealing Council Directives 82/176/EEC, 83/513/EEC, 84/156/EEC, 84/491/EEC, 86/280/EEC and amending Directive 2000/60/EC of the European Parliament and of the Council

[30] Council Directive of 4 May 1976 on pollution caused by certain dangerous substances discharged into the aquatic environment of the Community (76/464/EEC)

[31] Commission Directive 2009/90/EC of 31 July 2009 laying down, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, technical specifications for chemical analysis and monitoring of water status

[32] Directive 2013/39/EU of the European Parliament and of the Council of 12 August 2013 amending Directives 2000/60/EC and 2008/105/EC as regards priority substances in the field of water policy

disproportionate cost and/or socio-economic need, provided that no further deterioration occurs in the status of the affected bodies of water.

The determination of surface water chemical status by the 2015 deadline laid down in Article 4 of the WFD should be based, therefore, only on the substances and EQSs set out in the EQSD in the version in force on 13 January 2009 unless those EQSs are stricter than the revised EQS under Directive 2013/39/EU, in which case the revised (less strict) EQSs should be applied[33].

However, Directive 2013/39/EU requires Member States to achieve good chemical status by 2021 for those existing substances for which a more stringent standard has been adopted. This would require that an assessment is included in the second RBMPs to be adopted in 2015 on the basis of the new EQSs and, if necessary, measures should be included in the Programmes of Measures to be operational by 2018 at the latest.

Directive 2013/39/EU allows that, with regard to the presentation of chemical status for the purposes of the update of the Programmes of Measures and the RBMPs to be carried out in accordance with Article 11(8) and Article 13(7) of the WFD, respectively, Member States should be allowed to present separately the impact on chemical status of newly identified Priority Substances and of existing Priority Substances with revised EQSs. This is so that the introduction of new requirements is not mistakenly perceived as an indication that the chemical status of surface waters has deteriorated. In addition to the obligatory map covering all substances, additional maps could be separately provided covering newly identified substances, existing substances with revised EQSs, substances behaving like ubiquitous PBTs, and all other substances.

The EQSD also contains a provision regarding the possibility of designating Mixing Zones (Article 4 EQSD). This is linked with the so-called 'combined approach' (Article 10 WFD). Effluent discharge control regimes are normally designed to ensure that concentrations of Priority Substances or other pollutants in the receiving water do not exceed the EQS. However, if their concentration in the effluent is greater than the EQS value at the point of discharge there will be a zone of EQS exceedance in the vicinity of the point of discharge. Article 4 of the EQSD allows Member States to permit such zones of exceedance in water bodies when a number of criteria are met:

- Mixing Zones may be designated adjacent to points of discharge within which concentrations of one or more substances listed in Part A of Annex 1 of the EQSD may exceed the relevant EQS provided that they do not affect the compliance of the rest of the surface water body with those EQS.

- The Mixing Zones should be restricted to the proximity of the discharge and be proportionate.

- Certain information (such as on the approaches and methodologies applied to define such Mixing Zones; and on the measures taken with a view to reducing the extent of the Mixing Zones in the future) should be provided in the RBMPs (see also Section 7.4).

[33] See recital 9 of Directive 2013/39/EU and Article 3 paragraph 1a of Directive 2008/105/EC as amended by Directive 2013/39/EU. Directive 2013/39/EU adopts a less stringent AA-EQS for Naphthalene in transitional and coastal waters. In the case of Naphthalene this standard should be applied in the determination of chemical status. For all other substances the standards from Directive 2008/105/EC as in force on 13 January 2009 should be applied.

2.5.2. How will the European Commission and the EEA use the information reported?

The information reported by Member States will be used to establish the key indicator on the percentage of water bodies of good chemical status in the River Basin District or Sub-unit. In addition, the majority of the reported information will be used for visualisation purposes and for providing information to the public through WISE. Furthermore, the data and maps will provide a comparison of current status with the baseline status reported in the first RBMP enabling the question 'how has the water quality improved since the Programme of Measures required by the WFD was implemented?' to be answered. This means that the requested data and maps will be essential for trend analyses, for policy development and for the assessment of policy effectiveness.

Statistics and information will be provided to the European Parliament at EU level. Information will be provided to the public through WISE.

The European Commission also needs to identify whether Mixing Zones have been designated and the approaches used (see Section 7.3).

2.5.2.1. Products from reporting

Note: for all relevant products, information on surface water bodies will be presented by number of surface water bodies and by size (length or area) as well as percentage.

Nb	Name of product	Type of product	Scale of information*	Detailed information displayed	Source of detailed information and aggregation rule	Used in 2012 reports?
1	Priority Substances causing failure of good chemical status in surface water bodies	Table	MS	Number of surface water bodies in which each Priority Substance causes failure of good chemical status.	Aggregation of information reported at water body level.	It was not possible to produce (reporting of individual Priority Substances was optional).
2	Percentage of surface water bodies failing good chemical status	Map/ Chart	MS	Percentage of surface water bodies failing good chemical status by Category.	Aggregation of information reported at water body level	It was not possible to produce a complete picture because of large percentages of water bodies in unknown status.
3	Percentage of rivers, lakes, groundwater, transitional and coastal waters of good, poor and unknown chemical status	Chart	EU	Percentage of surface water bodies by chemical status class, by Category.	Aggregation on the basis of the information reported at water body level.	Yes
4	Chemical status of rivers and lakes	Chart	MS	Percentage of river and lake water bodies of poor and good chemical status.	Aggregation on the basis of the information reported at water body level – water bodies with unknown status not included.	Yes
5	Chemical status of rivers and lakes	Map	RBD	Percentage of river and lake water bodies failing to achieve good chemical status.	Aggregation on the basis of the information reported at water body level – water bodies with unknown status not included.	Yes

Nb	Name of product	Type of product	Scale of information*	Detailed information displayed	Source of detailed information and aggregation rule	Used in 2012 reports?
6	Chemical status of transitional and coastal water bodies	Chart	MS	Percentage of transitional and coastal water bodies in poor and good chemical status.	Aggregation on the basis of the information reported at water body level – water bodies with unknown status not included.	Yes
7	Chemical status of transitional, coastal and territorial water bodies	Map	RBD	Percentage of transitional, coastal and territorial water bodies failing to achieve good chemical status.	Aggregation on the basis of the information reported at water body level – water bodies with unknown status not included.	Yes
8	Aggregation tables: Ecological and chemical status of surface water bodies	Table	MS/ RBD/SU	Number and size (length/area) of chemical status of surface water bodies by Category.	Aggregation on the basis of the information reported at water body level.	Yes
9	Progress in achieving good status since the first RBMPs.	Map/ Chart/ Table	MS/ RBD/SU	Percentage of surface water bodies which have achieved good chemical status since the first RBMPs.	Aggregation on the basis of the information reported at water body level.	Not relevant in 2010 reporting
10	Progress towards achievement of good status since the first RBMPs by quality element	Map/ Chart/ Table	MS/ RBD/SU	Percentage of surface water bodies which have improved chemical status since the first RBMPs by quality element.	Aggregation on the basis of the information reported at water body level.	Not relevant in 2010 reporting
11	Reasons behind Article 4(4) exemptions	Chart/ Table	MS	Exemptions reported by Member States to extend the deadline of the achievement of good status beyond 2015 and reasons given (natural condition, technical feasibility, disproportionate costs or combinations).	Aggregation on the basis of the information reported at water body level.	Yes
12	Percentage of surface water bodies of good chemical status in 2015 based on 2008 EQS for PS in 2008 EQSD	Map/ Chart/ Table	EU/MS/ RBD/ SU	Percentage of surface water bodies of good chemical status in 2015, based on 2008 EQS for PS, aggregated for all surface water bodies, by Category.	Aggregation on the basis of the information reported at water body level.	No
13	Percentage of surface water bodies of good chemical status in 2015 based on 2013 EQS for PS in 2008 EQSD	Map/Chart/Table	EU/MS/RBD/ SU	Percentage of surface water bodies of good chemical status in 2015, based on 2013 EQS for PS, aggregated for all surface water bodies, by Category.	Aggregation on the basis of the information reported at water body level.	No
14	Percentage of surface water bodies in good chemical status in 2015 based on 2013 EQS for PS excluding uPBTs in 2008 EQSD	Map/ Chart/ Table	EU/MS/RBD/ SU	Percentage of surface water bodies of good chemical status in 2015, based on 2013 EQS for PS excluding uPBTs in 2008, aggregated for all surface water bodies, by Category.	Aggregation on the basis of the information reported at water body level.	No

Nb	Name of product	Type of product	Scale of information*	Detailed information displayed	Source of detailed information and aggregation rule	Used in 2012 reports?
15	**Percentage of surface water bodies in good chemical status in 2015 based on 2013 EQS for PS including uPBTs in 2008 EQSD**	Map/Chart/Table	EU/MS/RBD/SU	Percentage of surface water bodies of good chemical status in 2015, based on 2013 EQS for PS including uPBTs in 2008, aggregated for all surface water bodies, by Category.	Aggregation on the basis of the information reported at water body level.	No
16	**Differentiated presentation of assessments based on 2008 and 2013 standards**	Map/ Chart	EU/MS/RBD/SU	Comparison of the percentage of surface water bodies of good chemical status based on 2008 and 2013 EQS for PS.	Aggregation on the basis of the information reported at water body level.	No
17	**Designation of mixing zones and exceedances**	Chart/ Table	EU/MS/RBD/SU	Number of Mixing Zones designated. Percentage of Mixing Zones in relation to the whole length/area of surface water bodies (where information available). Substances showing or predicted to show exceedances in the Mixing Zones.	Aggregation of information reported at water body level.	It was not possible to produce (necessary information was not included in reporting requirements)

Notes: * Scale of information: EU = European; MS = National, Member State; RBD = River Basin District; SU = Sub-unit; WB = water body

2.5.3. Contents of the 2016 reporting

2.5.3.1. Schema sketch

See Annex 10.2.

2.5.3.2. Information and data to be reported using the schemas

Information regarding the chemical status of surface water bodies should be reported at surface water body level according to the schema SWB.

Schema: SWB (continued)
Class: SurfaceWaterBody (continued) *Properties: maxOccur: unbounded minOccur: 1*
Schema element: swChemicalStatusValue **Field type / facets:** StatusCode_Enum: 2, 3, U **Properties**: maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate the chemical status of the water body.

‘2’ = Good status. ‘3’ = Poor status. ‘U’ = Unknown status. With the exception of the AA-EQS for naphthalene in transitional waters, coastal waters and territorial waters, this should be based on the standards laid down in EQS Directive 2008/105/EC (version in force on 13 January 2009).
Schema element: swChemicalAssessmentYear **Field type / facets:** YearRangeType **Properties**: maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Provide the year on which the assessment of status is based. This may be the year that the surface water body was monitored. In case of grouping this may be the year in which monitoring took place in the surface water bodies within a group that are used to extrapolate results to non-monitored surface water bodies within the same group. A period is possible (e.g. 2011--2013).
Schema element: swChemicalAssessmentConfidence **Field type / facets:** Confidence_Enum: 0, 1, 2, 3 **Properties**: maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate the confidence on the chemical status assigned. ‘0’ = No information. ‘1’ = Low confidence. ‘2’ = Medium confidence. ‘3’ = High confidence. The criteria used by Member States to assess confidence vary considerably, but general guidance may be: Low = no monitoring data; Medium = limited or insufficiently robust monitoring data for some or all Priority Substances that are discharged in the RBD; High = good data for all Priority Substances that are discharged in the RBD.
Schema element: swChemicalMonitoringResults **Field type / facets:** MonitoringResults_Enum: Monitoring, Grouping, Expert judgement **Properties**: maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. Indicate on what basis the status classification was derived: 'Monitoring': there is monitoring data available from this water body and this is used for classfication. ‘Grouping’: there is no monitoring data available from this water body. Monitoring from other similar water bodies was used as a basis for classification, as described in the methodology for classification.

'Expert judgement': there is no monitoring data available in this surface water body. Results from other similar water bodies were not used. The status is mainly based on expert judgement. **Quality checks**: Quality checks: Conditional check: Report if element swChemicalStatusValue is ‘2’ or ‘3’ (i.e. not 'U').
Schema element: swChemicalStatusGrouping **Field type / facets:** FeatureUniqueEUCodeType **Properties**: maxOccurs =unbounded minOccurs = 0 **Guidance on completion of schema element**: Conditional. If no monitoring data is available for this surface water body and status has been derived through grouping by extrapolating monitoring data from other surface water bodies, indicate the codes of the surface water bodies which have been monitored and used in grouping. For example if the status of surface water body A has been determined by extrapolating monitoring data from surface water bodies B and C, then the euSurfaceWaterBodyCode for surface water bodies B and C should be reported in this element. **Quality checks**: Conditional check: Report if swChemicalMonitoringResults is ‘Grouping’. Within-schema check: euSurfaceWaterBodyCode reported in swChemicalStatusGrouping must be consistent with codes reported in SWB/SurfaceWaterBody/euSurfaceWaterBodyCode.
Schema element: swChemicalStatusExpectedGoodIn2015 **Field type / facets:** YesNoCode_Enum: Yes, No **Properties**: maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether it is expected that this surface water body will achieve good chemical status by the end of 2015. This may differ from the data reported under swChemicalStatusValue 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. The methodology of this assessment should be clearly explained in the RBMP or background documents (reference reported under classification methodologies (see Section 7.4)). If an Article 4(4) or 4(5) exemption for chemical status is applied then 'No' should be selected. **Quality checks**: Within-schema check: If swChemicalExemptionType for any of the substances reported as exceeding is 'Article 4(4)…' or ‘Article 4(5)…’, the option ‘No’ must be selected from the enumeration list.
Schema element: swChemicalStatusExpectedAchievementDate **Field type / facets:** GoodStatus_Enum: 2016--2021 2022--2027 Beyond 2027 Unknown

Less stringent objectives already achieved **Properties**: maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. If good chemical status will NOT be achieved by 2015 (swChemicalStatusExpectedGoodIn2015 is No), report the date by which it is expected that it will be achieved in full. The methodology of this assessment should be clearly explained in the RBMP or background documents (reference reported under classification methodologies). If good chemical status will not be achieved by 2015, exemptions should be applied. Please report the date by which it is expected that good chemical status will be achieved in full, not the date relating to individual exemptions. However, please note the following: Article 4(4) exemptions relate to the extension of deadlines. According to Article 4(4)c of the WFD, postponing the achievement of objectives beyond two further updates of the river basin management plan is only possible due to natural conditions. If Article 4(5) exemptions apply, report the date by when the less stringent objective is to be achieved. If the less stringent objective has already been achieved then select 'Less stringent objectives already achieved'. If good chemical status will be achieved by 2015 (swChemicalStatusExpectedGoodIn2015 is Yes) this element should not be reported. **Quality checks**: Quality checks: Conditional check: Report if swChemicalStatusExpectedGoodIn2015 is 'No'. Within-schema check: 'Less stringent objectives already achieved' is only a valid entry if 'Article 4(5)…' is reported under swChemicalExemptionType.
Schema element: swMixingZones **Field type / facets:** YesNoCode_Enum: Yes, No **Properties**: maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Optional. Report whether Mixing Zones have been designated in the surface water body.
Schema element: swMixingZonesProportion **Field type / facets:** NumberPercentageType **Properties**: maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Optional. Report the percentage of length or area of the surface water body that has been designated as a Mixing Zone.

The following class (child of SurfaceWaterBody) is used to report information about priority substances at water body level. Report all priority substances for which <u>one or more</u> of the following circumstances occur in the relevant water body:

- The substance is causing failure of chemical status due to exceedance of the relevant EQS (element swPrioritySubstanceCausingFailure and swPrioritySubstanceExceedanceType)

- The priority substance has improved from poor to good chemical status since the first RBMP (element swPrioritySubstanceImprovingChemicalStatus)
- The more stringent EQSs adopted in Directive 2013/39/EU caused the status of the surface water body to appear to deteriorate (element swPrioritySubstanceEffectStatusNewThresholds)
- The priority substance exceeds or is expected to exceed the EQS within the mixing zone (optional element swPrioritySubstanceExceedanceInMixingZone)

Schema: SWB (continued)
Class: SWPrioritySubstance *Properties; max Occur: unbounded minOccur: 0*
Schema element: swPrioritySubstanceCode Field type / facets / relationship: PS_Enum (see Annex 8d) Properties: maxOccurs =1 minOccurs = 1 Guidance on completion of schema element: Required[34]. Select each priority substance for which one or more of the following circumstances occur in the relevant water body: - The substance is causing failure of chemical status due to exceedance of the relevant EQS (element swPrioritySubstanceCausingFailure and swPrioritySubstanceExceedanceType) - The priority substance has improved from poor to good chemical status since the first RBMP (element swPrioritySubstanceImprovingChemicalStatus) - The more stringent EQSs adopted in Directive 2013/39/EU caused the status of the surface water body to appear to deteriorate (element swPrioritySubstanceEffectStatusNewThresholds) - The priority substance exceeds or is expected to exceed the EQS within the mixing zone (optional element swPrioritySubstanceExceedanceInMixingZone)
Schema element: swPrioritySubstanceCausingFailure Field type / facets / relationship: YesNoCode_Enum: Yes, No Properties: maxOccurs =1 minOccurs = 1 Guidance on completion of schema element: Required. Indicate if the priority substance is causing failure to achieve good chemical status. Information on exceedances from ubiquitous substances should be reported. For substances for which EQS were made more stringent in the 2013 amendment of the EQS Directive (Anthracene, Brominated diphenylethers, Fluoranthene, Lead and its compounds, Naphthalene, Nickel and its compounds and Polyaromatic hydrocarbons (PAH)), exceedances of either the 2008 EQS or the 2013 EQS, or both, should be reported here. Exceedances of the latter should be reported even when swChemicalStatusValue is good on the basis of the less stringent

[34] Please note that the multiplicity of the Class SWPrioritySubstance is 0 to many. Therefore, if there are no priority substances to report for the relevant water body, this whole class does not need to be reported.

2008 standards, in order to enable the reporting of swPrioritySubstanceExceedanceType and, if appropriate, of swChemicalExemptionType and swChemicalExemptionPressure. The substances causing exceedances to the 2013 EQSs but not to the 2008 EQSs should also be reported under schema element swEffectStatusNewThresholds. See table at the end of this section of the guidance on different scenarios for these substances and the corresponding reporting values. Quality checks: If swChemicalStatusValue is '3', at least 1 substance should be reported as 'Yes' in swPrioritySubstanceCausingFailure. The substances reported under swEffectStatusNewThresholds must be reported here as exceedances.
Schema element: swPrioritySubstanceExceedanceType Field type / facets / relationship: EQStandardType_Enum: AA EQS MAC EQS Both Properties: maxOccurs =1 minOccurs = 0 Guidance on completion of schema element: Conditional. For each Priority Substance exceeding EQS, indicate which EQS is exceeded. 'AA EQS' = Annual Average of the EQS. 'MAC EQS' = Maximum Allowable Concentration of the EQS. 'Both' = Both. Quality checks: Conditional check: report if 'swPrioritySubstanceCausingFailure' is 'Yes'
Schema element: swPrioritySubstanceImprovingChemicalStatus Field type / facets: YesNoCode_Enum: Yes, No Properties: maxOccurs = 1 minOccurs = 1 Guidance on completion of schema element: Required. Report whether the Priority Substance improved from poor to good chemical status since the first RBMP. For the Priority Substances for which the EQSs have changed in the 2013 amendment of the EQS Directive (2013/39/EU), the improvement should refer to the 2008 EQS.
Schema element: swPrioritySubstanceEffectStatusNewThresholds Field type / facets: YesNoNotApplicable_Union_Enum: Yes, No, Not applicable Properties: maxOccurs = 1 minOccurs = 1 Guidance on completion of schema element: Required. If the priority substance is one of the seven for which more stringent EQSs were adopted in Directive 2013/39/EU, indicate if the new standard caused the status of the surface water body to appear to deteriorate. If not one of the seven report 'Not applicable'. The assessment of failure according to the new, more stringent standards is relevant for the purpose of meeting the 2021 good chemical status objective as set in Article 3 paragraph 1a(i) of EQS Directive 2008/105/EC as amended by Directive 2013/39/EU.

Quality checks: The options 'Yes' and 'No' are only valid for the following seven priority substances: Anthracene, Brominated diphenylethers, Fluoranthene, Lead and its compounds, Naphthalene, Nickel and its compounds, Polyaromatic hydrocarbons (PAH). For all other priority substances the option 'Not applicable' must be reported.
Schema element: swPrioritySubstanceExceedanceInMixingZone **Field type / facets:** YesNoCode_Enum: Yes, No **Properties**: maxOccurs = 1 minOccurs = 0 **Guidance on completion of schema element**: Optional. Report whether the Priority Substance exceeds or is expected to exceed the EQS within the Mixing Zone in the surface water body. **Quality checks**: Reporting is possible only if 'swMixingZones' is 'Yes',

The following class (child of SWPrioritySubstances) is used to report exemptions at priority substance level.

Schema: SWB (continued)
Class: SWChemicalExemptionType ***Properties****; max Occur: unbounded minOccur: 0* *Conditional: report if 'swPrioritySubstanceCausingFailure' is 'Yes'.*
Schema element: swChemicalExemptionType **Field type / facets:** ExemptionType_Enum (see Annex 8g) **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Report which type(s) of exemption(s) apply if good chemical status is not expected to be achieved by 2015 for that priority substance. If there are exceedances of the EQSs made more stringent in 2013 (for substances Anthracene, Brominated diphenylethers, Fluoranthene, Lead and its compounds, Naphthalene, Nickel and its compounds and Polyaromatic hydrocarbons (PAH)), report which type(s) of exemption(s) apply if good chemical status is not expected to be achieved by 2021. More than one exemption may apply to a surface water body. Article 4(6) exemptions can also be reported if relevant for chemical status (e.g. accidents). Article 4(7) exemptions are not relevant for good chemical status and therefore cannot be reported. **Quality checks**: Within-schema check: The option 'No exemption' is not compatible with any other. Therefore, if reported, no more instances of 'swChemicalExemptionType' should be reported. The options 'Article4(7) - New modification' and 'Article4(7) - Sustainable human development' are not valid for chemical status and therefore cannot be reported.
Schema element: swChemicalExemptionPressure **Field type / facets**: SignificantPressureType_Enum (see Annex 1a) **Properties:** maxOccurs = unbounded minOccurs = 0

Guidance on completion of schema element: Conditional. If any Article 4(4) or 4(5) exemptions apply to this surface water body for chemical status, report the significant pressure(s) that are causing failure in order to justify the exemption(s).

Quality checks: Conditional check: If swChemicalExemptionType is not 'No exemption', at least one significant pressure type must be selected from the enumeration list.

The options 'No significant pressure' and 'Not applicable' are not valid.

For substances XYZ (Anthracene, Brominated diphenylethers, Fluoranthene, Lead and its compounds, Naphthalene, Nickel and its compounds and Polyaromatic hydrocarbons (PAH)) for which EQS were made more stringent in the 2013 amendment of the EQS Directive, the following scenarios are possible. The table indicates the appropriate values for selected schema elements, according to each scenario:

Scenarios	Scenario 1: GCS is expected to be achieved in 2015 on the basis of both the 2008 and the 2013 EQSs	Scenario 2: GCS is expected to be achieved in 2015 on the basis of the 2008 EQS but not on the basis of the 2013 EQS, which will be achieved only in 2021.	Scenario 3: GCS is expected to be achieved in 2015 on the basis of the 2008 EQS but not on the basis of the 2013 EQS, which will be achieved only after 2021.	Scenario 4: GCS is not achieved in 2015, neither on the basis of 2008 nor 2013 EQS and it is expected to be achieved only after 2021.
Is GCS expected to be achieved in 2015 on the basis of 2008 EQSs?	Yes	Yes	Yes	No
Is GCS expected to be achieved in 2015 on the basis of 2013 EQSs?	Yes	No	No	No
Is GCS expected to be achieved in 2021 on the basis of the 2013 EQSs?	Yes	Yes	No	No
Selected schema element values				
swChemical StatusValue	=2 (good)*	=2 (good)	=2 (good)	=3 (poor)
swChemicalStatus ExpectedGoodIn2015	Yes	Yes	Yes	No
swPrioritySubstance EffectStatusNewThresholds	No	Yes	Yes	No
swPrioritySubstance CausingFailure	No*	Yes	Yes	Yes
swChemical ExemptionType	No exemption	No exemption	Select exemption type	Select exemption type

GCS means Good Chemical Status.
Please note that this table includes only a selection of the elements in this part of the schema. The schema elements not included are to be reported in all scenarios if appropriate, according to the guidance provided.

* In some cases swChemicalStatusValue could be 3 (poor), with GCS expected in 2015. See Guidance on completion of schema element swChemicalStatusExpectedGoodIn2015.

3. REPORTING AT GROUNDWATER BODY LEVEL (SCHEMA GWB)

3.1. Overview of the structure of the 2016 reporting contents

Reporting at groundwater body level is done for each RBD. For the purpose of presentation in this guidance, the contents of reporting are structured according to the following sub-chapters:

- Groundwater body characterisation
- Pressures and impacts on groundwater bodies
- Quantitative status of groundwater bodies
- Chemical status of groundwater bodies

The following sections describe the contents of reporting. The UML diagram of the GWB schema is found in Annex 10.3.

3.2. Characterisation of groundwater

3.2.1. Introduction

Article 5 and Annex II of the WFD requires Member States to identify the location and boundaries of groundwater bodies.

3.2.2. How will the European Commission and the EEA use the information reported?

The European Commission will use the information provided on the level of subdivision of groundwater to ensure that this is adequate to describe the status of groundwater bodies. The information will also be used to assess whether and how Member States have implemented the key obligations of the WFD. Statistics and information will be provided to the European Parliament at EU level. Information will be provided to the public through WISE.

3.2.2.1. Products from reporting

The following products will be produced by the European Commission or the EEA from the data and information reported by Member States

Nb	Name of product	Type of product	Scale of information*	Detailed information displayed	Source of detailed information and aggregation rule	Used in 2012 reports?*
1	Number and average size of groundwater bodies	Table	EU/MS/ RBD/ SU	Number and size (area) of groundwater bodies. Total area of groundwater bodies. Average size of groundwater bodies.	Average: sum of area of all groundwater bodies divided by the number of groundwater bodies. Aggregation on the basis of the information reported at water body level.	SWD pg 71 EEA1 pg 19 WISE WFD database
2	Spatial reference layer of groundwater bodies	Spatial dataset	WB	Mapping of all groundwater bodies.	Spatial dataset including all groundwater bodies.	Yes

Notes: * Scale of information: EU = European; MS = National, Member State; RBD = River Basin District; SU = Sub-unit; WB = water body

3.2.3. Contents of 2016 reporting

3.2.3.1. Schema sketch

See Annex 10.3.

3.2.3.2. Information and data to be reported using the schemas

Information regarding the delineation and characterisation of groundwater bodies should be reported at groundwater body level according to the schema GWB.

Schema: GWB
Class: GroundWaterBody *Properties: maxOccur: unbounded minOccur: 1*
Schema element: euGroundWaterBodyCode **Field type / facets:** FeatureUniqueEUCodeType **Properties**: maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Unique EU code of the groundwater body. Prefix the groundwater body's national, unique code with the Member State's 2-alpha character ISO country code[35]. **Quality checks**: Element check: First 2 characters must be Member State's 2-alpha character ISO country code. Within-schema check: euGroundWaterBodyCode must be unique.
Schema element: groundwaterBodyName **Field type / facets:** String250Type **Properties**: maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Readily understandable name of the groundwater body in English that is meaningful outside of the RBD or Member State.
Schema element: layered **Field type / facets:** YesNoNoInformation_Union_Enum: Yes, No, No information **Properties**: maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether the groundwater body is layered.
Schema element: linkSurfaceWaterBody

[35] Member State's 2-alpha character ISO country code: http://publications.europa.eu/code/en/en-370100.htm (Note: for Greece use 'EL' and United Kingdom use 'UK')

Field type / facets: YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether the groundwater body is associated with one or more surface water bodies.
Schema element: linkSurfaceWaterBodyCode **Field type / facets:** FeatureUniqueEUCodeType **Properties**: maxOccurs =unbounded minOccurs = 0 **Guidance on completion of schema element**: Conditional. If the groundwater body is associated with one or more surface water bodies, report the surface water body codes of the associated surface water bodies. **Quality checks**: Element check: First 2 characters must be the Member State's 2-alpha character ISO country code. Conditional check: Report if linkSurfaceWaterBodies is 'Yes'. Cross-schema check: The reported linkSurfaceWaterBodiesCodes must be consistent with the codes reported in SWB/SurfaceWaterBody/euSurfaceWaterBodyCode.
Schema element: linkTerrestrialEcosystem **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether a terrestrial ecosystem is directly dependent on the groundwater body. In order for terrestrial ecosystems to be considered as part of the classification for groundwater bodies, they need to be 'directly dependent' on the groundwater body. This means that the groundwater body should provide quantity (flow, level) or quality of water needed to sustain the ecosystems which are the reasons for the significance of the groundwater dependent terrestrial ecosystem. This critical dependence upon a groundwater body is most likely to occur where groundwater supplies the groundwater dependent terrestrial ecosystem for a significant part of, or a significant time period during, the year. For more information see Technical Report No. 6 Technical Report on Groundwater - Dependent Terrestrial Ecosystems[36].
Schema element: geologicalFormation **Field type / facets:** GeologicalFormation_Enum: Porous - highly productive Porous - moderately productive Fissured aquifers including karst - highly productive Fissured aquifers including karst - moderately productive Fractured aquifers - highly productive

[36] http://bookshop.europa.eu/en/technical-report-on-groundwater-dependent-terrestrial-ecosystems-pbKHAV12006/

Fractured aquifers - moderately productive Insignificant aquifers - local and limited groundwater Not available Unknown **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Describe the main geological formation of the aquifer type.
Schema element: groundwaterBodyTransboundary **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. The Directive requires coordination among Member States for the management of transboundary Water Bodies. Transboundary water bodies are those crossing the border between countries or constituting part of the border between two countries for a certain length. For reporting purposes in the case of water bodies that cross the border between countries, and for the sake of clarity, each Member State should report on its own part of these trans-boundary Water Bodies. Geographic information should therefore be provided for the part of the Water Body within the reporting Member State and likewise for all elements which have a clear geographical reference (e.g. size, monitoring stations). Each Member State should also report on all elements that apply to the whole water body (status, pressures, etc). For the latter the Commission expects that the information provided by each of the Member States concerned will be identical, as a result of the coordinated management required by the Directive.
Schema element: gwAssociatedProtectedArea **Field type / facets:** YesNoCode_Enum: Yes, No **Properties**: maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether the groundwater body is associated to any protected area.

3.2.3.3.GIS information

GIS information should be reported in GML file format (see Annex 5 for further information) for **all groundwater bodies**, not just those larger than 100 km^2 as was the case in 2010.

For further information and specifications on the reporting of GIS data please refer to Annex 5 (GIS guidance).

3.3. Pressures and impacts on groundwater

3.3.1. Introduction

Article 5 of the WFD requires Member States to identify the significant pressures present in the RBD likely to cause groundwater bodies to be of less than good status. It also requires Member States to assess the impacts on groundwater bodies to support the determination of status.

See section on pressures and impacts for surface water bodies for further background information.

3.3.2. How will the European Commission and the EEA use the information reported?

The purpose of the collection of the information is to identify the main pressures within the RBD. The summary information will be used to compile maps at a European level of relevant pressures and to ensure that relevant pressures have been identified at RBD level. Statistics and information will be provided to the European Parliament at EU wide level. Information will be provided to the public through WISE.

3.3.2.1. Products from reporting

Nb	Name of product	Type of product	Scale of information*	Detailed information displayed	Source of detailed information and aggregation rule	Used in 2012 reports?*
1	Significant pressures affecting groundwater bodies of poor status	Chart	EU/MS/ RBD/ SU	Pressures affecting groundwater bodies of poor quantitative status.	Aggregation on the basis of the information reported at water body level.	Yes
2	Pollutants causing risk / TV exceedance / poor status	Table	EU/MS/ RBD/ SU	Pollutants causing risk in groundwater bodies.	Aggregation on the basis of the information reported at water body level.	No

3.3.3. Contents of 2016 reporting

3.3.3.1. Schema sketch

See Annex 10.3.

3.3.3.2. Information and data to be reported using the schemas

Information regarding the pressures and impacts on groundwater bodies should be reported at groundwater body level according to the schema GWB.

Schema: GWB (continued)
Class: GroundWaterBody (Continued) *Properties: maxOccur: unbounded minOccur: 1*
Schema element: gwSignificantPressureType Field type / facets: SignificantPressureType_Enum (see Annex 1a) Properties: maxOccurs =unbounded minOccurs = 1

Guidance on completion of schema element: Required. Indicate the significant pressure type(s) from the enumeration list.

If a combination of pressure-driver is not significant on its own but it is in combination with others, select all the relevant pressures of that type that are present which make the overall pressure significant (e.g. if abstraction from industry or agriculture is not relevant on their own but they are relevant in combination, select both).

If the quantitative status of the groundwater body is poor, at least one significant pressure type must be reported. The option 'No significant pressure' is not valid.

If the chemical status of the groundwater body is poor, at least one significant pressure type must be reported. The option 'No significant pressure' is not valid.

Quality checks:

Within-schema check: the option 'No significant pressure' is not compatible with any other.

Within-schema check: If GroundWaterBody/gwQuantitativeStatusValue is '3', at least one significant pressure type must be selected from the enumeration list (can include '8 Unknown pressures'). The option 'No significant pressure' is not a valid selection.

The option 'Not applicable' is not valid.

Schema element: gwSignificantPressureOther

Field type / facets: String1000Type

Properties: maxOccurs =1 minOccurs = 0

Guidance on completion of schema element: Conditional. If '**7 – Anthropogenic pressure - Other**' is selected from the enumeration list and reported under gwSignificantPressureType, provide details of any other anthropogenic pressures which are relevant in this element. This element should only be reported if the pressure type is not included in the enumeration list under gwSignificantPressureType.

Quality checks: Conditional check: Report if '**7 – Anthropogenic pressure - Other**' is selected from the enumeration list under gwSignificantPressureType.

Schema element: gwSignificantImpactType

Field type / facets: SignificantImpactType_Enum (see Annex 1b)

Properties: maxOccurs =unbounded minOccurs = 1

Guidance on completion of schema element: Required. Indicate the impact type(s) from the enumeration list.

If the quantitative status of the groundwater body is poor, at least one significant impact type or the option '**UNKN - Unknown impact type**' must be reported. The option '**NOSI - No significant impact**' is not valid.

If the chemical status of the groundwater body is poor, at least one significant impact type or the option '**UNKN - Unknown impact type**' must be reported. The option '**NOSI - No significant impact**' is not valid.

Quality checks:

Within-schema check: the option '**NOSI - No significant impact**' is not compatible with any other.

Within-schema check: If GroundWaterBody/gwQuantitativeStatusValue is '3', at least one significant impact type or the option 'UNKN - Unknown impact type' must be selected from the enumeration list. The option 'NOSI - No significant impact' is not a valid selection. Within-schema check: If GroundWaterBody/gwChemicalStatusValue is '3', at least one significant impact type or the option 'UNKN - Unknown impact type' must be selected from the enumeration list. The option 'NOSI - No significant impact' is not a valid selection. The option ' NOTA - Not applicable' is not valid.
Schema element: gwSignificantImpactOther Field type / facets: String1000Type Properties: maxOccurs =1 minOccurs = 0 Guidance on completion of schema element: Conditional. If ' OTHE - Other significant impact type' is selected from the enumeration list under gwSignificantImpactType, provide details of any other impact types which are relevant in this element. This element should only be reported if the impact type is not included in the enumeration list under gwSignificantImpactType. Quality checks: Conditional check: Report if ' OTHE - Other significant impact type' is selected from the enumeration list under gwSignificantImpactType.

3.3.3.3. Glossary: clarification of terms and reporting requirements

Some Member States which have a large number of groundwater bodies with low pressures **group groundwater bodies** for the assessment of pressures and status. The information reported for the groundwater bodies belonging to a group will therefore be identical.

3.4. Quantitative status of groundwater and exemptions

3.4.1. Introduction

Annex V and Article 4 of the WFD specify how Member States are to monitor groundwater, and present and report the results of the quantitative status assessment and the methodology used to classify groundwater bodies.

Article 4(4-9) of the WFD allows Member States to extend the deadlines for the achievement of good status or to set other, less stringent objectives under certain specified circumstances. Additional information can be found in the CIS Guidance Document No. 20: Guidance Document on Exemptions to the Environmental Objectives[37] . Article 4(4-9) goes on to require Member States to provide information regarding such extensions or other objectives, and reasons, in the River Basin Management Plans.

[37] https://circabc.europa.eu/sd/a/2a3ec00a-d0e6-405f-bf66-60e212555db1/Guidance_documentN%C2%B020_Mars09.pdf

3.4.2. How will the European Commission and the EEA use the information reported?

Key indicators of the level of compliance with the WFD will be the proportion of groundwater bodies in good quantitative status in the RBD or Sub-unit, together with the number of groundwater bodies at risk of failing good quantitative status.

The majority of the data and information reported by Member States will be used for visualisation in maps, graphs and charts, and for providing information to the public through WISE. Furthermore, the data and maps will provide a comparison of current status with the baseline status reported in the first RBMPs (e.g. answering the question: has quantitative status improved since the Programme of Measures required by the WFD was implemented?) This means that the requested data and maps will be essential for trend analyses, for policy development and for the assessment of policy effectiveness.

Statistics and information will be provided to the European Parliament at EU level. Information will be provided to the public through WISE.

3.4.2.1. Products from reporting

Note: for all relevant products, information on groundwater bodies will be presented by number of groundwater bodies and by size (area) as well as percentage.

Nb	Name of product	Type of product	Scale of information*	Detailed information displayed	Source of detailed information and aggregation rule	Used in 2012 reports?*
1	**Number, area and percentage of groundwater bodies of good quantitative status and expected improvement**	Table	WB	Number, area and percentage of groundwater bodies of good quantitative status and expected improvement since the first RBMPs.	Aggregation on the basis of the information provided at water body level.	Yes
2	**Drivers responsible for failure of good quantitative status**	Table	RBD	Number and area of groundwater bodies failing good quantitative status due to each driver. Percentage of groundwater bodies failing good status due to each driver in relation to total number of groundwater bodies failing good status.	Aggregation on the basis of the information on pressures provided at water body level	It was not possible to produce (drivers were not reported unless linked to pressures reported at detailed level, which was optional)
3	**Quantitative status of groundwater bodies**	Chart	National	Percentage of groundwater bodies of poor and good quantitative status by area.	Aggregation on the basis of the information reported at water body level.	No
4	**Quantitative status of groundwater bodies**	Map	RBD	Percentage of groundwater bodies not achieving good quantitative status by area.	Aggregation on the basis of the information reported at water body level – water bodies with unknown status not included.	Yes

5	**Aggregation tables: Quantitative and chemical status of groundwater bodies**	Table	MS/RBD	Number and size (area) of groundwater bodies by quantitative status class.	Aggregation on the basis of the information reported at water body level.	Yes
6	**Progress in achieving good quantitative status since the first RBMP**	Map/ Chart	MS/RBD	Number, area and percentage of groundwater bodies which have achieved good quantitative status since the first RBMPs.	Aggregation on the basis of the information reported at groundwater body level.	Not relevant in 2010 reporting
7	**Improvement in quantitative status since the first RBMP**	Map/ Chart	National/ RBD	Percentage of water bodies which have improved quantitative status since the first RBMP	Aggregation on the basis of the information reported at water body level.	Not relevant in 2010 reporting
8	**Reasons behind Article 4(4) exemptions**	Chart	MS	Exemptions reported by Member States to extend the deadline of the achievement of good quantitative status beyond 2015 and reasons given (natural condition, technical feasibility, disproportionate costs or combinations).	Aggregation on the basis of the information reported at water body level.	Yes
9	**Percentage of groundwater bodies expected to be of good quantitative status in 2015**	Map/ Chart/ Table	EU/MS/ RBD	Number, area and percentage of groundwater bodies expected to be of good quantitative status in 2015.	Aggregation on the basis of the information reported at water body level.	No

Notes: * Scale of information: EU = European; MS = National, Member State; RBD = River Basin District; SU = Sub-unit; WB = water body

3.4.3. Contents of the 2016 reporting

3.4.3.1. Schema sketch

See Annex 10.3.

3.4.3.2. Information and data to be reported using the schemas

Information regarding the quantitative status of groundwater bodies should be reported at groundwater body level according to the schema GWB.

Schema: GWB (continued)
Class: GroundWaterBody (continued) *Properties: maxOccurs = unbounded minOccurs = 1*
Schema element: gwAtRiskQuantitative **Field type / facets:** YesNoCode_Enum: Yes, No **Properties**: maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Report whether the groundwater body is at

risk of failing to be of good quantitative status. Please follow the approach given in the 'CIS Guidance Document No. 26: Risk assessment and the use of conceptual models'[38].
Schema element: gwReasonsForRiskQuantitative **Field type / facets:** QuantitativeFailure_Enum: Water balance Surface water Groundwater dependent terrestrial ecosystems Saline or other intrusion **Properties**: maxOccurs =unbounded minOccurs = 0 **Guidance on completion of schema element**: Conditional. If the groundwater body is at risk of failing to be of good quantitative status, select reasons from the 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: Groundwater Status and Trends Assessment[39]. **Quality checks**: Conditional check: Report if gwAtRiskQuantitative is 'Yes'.
Schema element: gwEORiskQuantitative **Field type / facets:** GWEORiskQuantitative_Enum: Uses or functions Surface waters / terrestrial ecosystems Both **Properties**: maxOccurs =1 minOccurs = 0

[38] CIS Guidance Document No. 26: Risk assessment and the use of conceptual models: https://circabc.europa.eu/sd/a/8564a357-0e17-4619-bd76-a54a23fa7885/Guidance%20No%2026%20-%20GW%20risk%20assessment%20and%20conceptual%20models.pdf

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

Guidance on completion of schema element: Conditional. If the groundwater body is at risk of failing to be of good quantitative status, select 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.

Quality checks: Conditional check: Report if gwAtRiskQuantitative is 'Yes'.

Schema element: gwQuantitativeStatusValue

Field type / facets: StatusCode_Enum: 2, 3, U

Properties: maxOccurs =1 minOccurs = 1

Guidance on completion of schema element: Required. Indicate the quantitative status of the groundwater body, based on the most recently assessed status of the groundwater body.

'2' = Good status.

'3' = Poor status.

'U' = Unknown status.

Schema element: gwQuantitativeReasonsForFailure

Field type / facets: QuantitativeFailure_Enum:

Water balance

Surface water

Groundwater dependent terrestrial ecosystems

Saline or other intrusion

Properties: maxOccurs =unbounded minOccurs = 0

Guidance on completion of schema element: Conditional. If the groundwater body is of poor quantitative status, select reasons from the 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[40]. **Quality checks**: Conditional check: Report if gwQuantitativeStatusValue is '3'.
Schema element: gwQuantitativeAssessmentYear **Field type / facets:** YearRangeType **Properties**: maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Provide the year on which the assessment of status is based. This may be the year that the groundwater body was monitored. In case of grouping this may be the year in which monitoring took place in the groundwater bodies within a group that are used to extrapolate results to non-monitored groundwater bodies within the same group. A period is possible (e.g. 2011--2013).
Schema element: gwQuantitativeAssessmentConfidence **Field type / facets:** Confidence_Enum: 0, 1, 2, 3 **Properties**: maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate the confidence on the quantitative status assigned. '0' = No information. '1' = Low confidence (e.g. no monitoring data, or no conceptual model or understanding of the system). '2' = Medium confidence (e.g. limited or insufficiently robust monitoring data and expert judgment plays a significant role in assessment of status). '3' = 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). The criteria used by Member States to assess confidence vary considerably, but the above examples provide some general guidance. For further information, please see 'CIS Guidance Document No. 7: Monitoring under the Water Framework Directive'[41] and 'CIS Guidance Document No. 15: Groundwater monitoring'[42].
Schema element: gwQuantitativeStatusExpectedGoodIn2015 **Field type / facets:** YesNoCode_Enum: Yes, No

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

[41] https://circabc.europa.eu/sd/a/63f7715f-0f45-4955-b7cb-58ca305e42a8/Guidance%20No%207%20-%20Monitoring%20(WG%202.7).pdf

[42] https://circabc.europa.eu/sd/a/e409710d-f1c1-4672-9480-e2b9e93f30ad/Groundwater%20Monitoring%20Guidance%20Nov-2006_FINAL-2.pdf

Properties: maxOccurs =1 minOccurs = 1

Guidance on completion of schema element:

Required. Indicate whether it is expected that this groundwater body will achieve good quantitative status by the end of 2015.

This may differ from the data reported under gwQuantitativeStatusValue 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. The methodology of this assessment should be clearly explained in the RBMP or background documents (reference reported under classification methodologies). If an Article 4(5) exemption for quantitative status is applied then 'No' should be selected.

Quality checks: Within-schema check: If gwQuantitativeExemptionType is 'Article 4(4)...' or Article 4(5)…', the option 'No' must be selected from the enumeration list.

Schema element: gwQuantitativeStatusExpectedAchievementDate

Field type / facets: GoodStatus_Enum:

2016--2021

2022--2027

Beyond 2027

Unknown

Less stringent objectives already achieved

Properties: maxOccurs =1 minOccurs = 0

Guidance on completion of schema element: Conditional. If good quantitative status will not be achieved by 2015 (gwQuantitativeStatusExpectedGoodIn2015 is No), report the date by which it is expected that it will be achieved in full. The methodology of this assessment should be clearly explained in the RBMP or background documents (reference reported under classification methodologies).

If good quantitative status will not be achieved by 2015, exemptions should be applied. Please report the date by which it is expected that good quantitative status will be achieved in full, not the date relating to individual exemptions. However, please note the following:

Article 4(4) exemptions relate to the extension of deadlines. According to Article 4(4)c of the WFD, postponing the achievement of objectives beyond 2027 is only possible due to natural conditions.

If Article 4(5) exemptions apply, report the date by when the less stringent objective is to be achieved. If the less stringent objective has already been achieved then select 'Less stringent objectives already achieved'.

If good quantitative status will be achived by 2015 (gwQuantitativeStatusExpectedGoodIn2015is Yes) this element should not be reported.

Quality checks: Conditional check: Report if gwQuantitativeStatusExpectedGoodIn2015 is 'No'.

Within-schema check: 'Less stringent objectives already achieved' is only a valid entry if 'Article 4(5)…' is reported under gwQuantitativeExemptionType.

Schema element: gwQuantitativeExemptionType **Field type / facets:** ExemptionType_Enum (see Annex 8g) **Properties:** maxOccurs =unbounded minOccurs = 1 **Guidance on completion of schema element**: Required. Report which type(s) of exemption(s) apply if good quantitative status is not expected to be achieved by 2015. More than one exemption may apply to a groundwater body. **Quality checks**: Within-schema check: 'No exemption' is not compatible with any other option. Within-schema check: if gwQuantitativeStatusExpectedGoodIn2015is 'No' then the option 'No exemption' is not possible. One or more of the other options must be selected.
Schema element: gwQuantitativeExemptionPressure **Field type / facets:** SignificantPressureType_Enum (see Annex 1a) **Properties**: maxOccurs =unbounded minOccurs = 0 **Guidance on completion of schema element**: Conditional. If any Article 4(4), Article 4(5), Article 4(6) and/or Article 4(7) exemptions apply to this groundwater body for quantitative status, report the significant pressure(s) that are causing failure in order to justify the exemption(s). **Quality checks**: Conditional check: If gwQuantitativeExemptionType is not 'No exemption', at least one significant pressure type must be selected from the enumeration list. The options 'No significant pressure' and 'Not applicable' are not valid.

3.5. Chemical status of groundwater and exemptions

3.5.1. Introduction

Annex V of the WFD specifies how Member States are to monitor groundwater and present chemical status classification results. The detailed provisions and criteria for status assessments are laid down in the Groundwater Directive (GWD) (2006/118/EC)[43].

In addition to the reporting requirements of the WFD, the GWD introduces several additional reporting requirements to ensure that groundwater body status has been defined according to its provisions, and in a consistent and comparable way across the EU.

Both the WFD and GWD require that the results of the chemical status assessment and the methodology used to classify groundwater bodies are reported. The requirements are laid down in WFD Annex V, GWD Article 4, and Annex III (reporting requirements in GWD Article 4.4 and Annex III point 5).

[43] Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration: http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1410784650720&uri=CELEX:32006L0118

Articles 4(4) to 4(9) of the WFD allow Member States to extend the deadlines for the achievement of good status or to set other objectives under certain specified circumstances. Additional information can be found in the CIS Guidance Document No. 20: Exemptions to the Environmental Objectives[44] agreed in 2005.

Articles 4(4) to 4(9) go on to require Member States to provide information in the RBMP regarding such extensions or other objectives and their reasons.

3.5.2. How will the European Commission and the EEA use the information reported?

The information reported by Member States will be used to establish the key indicator on the proportion of groundwater bodies of good chemical status in the River Basin District or Sub-unit, together with the number of groundwater bodies at risk of not achieving good chemical status. The majority of the reported information will be used for visualisation purposes and for providing information to the public through WISE. Furthermore, the data and maps will provide a comparison of current status with the baseline status reported in the first RBMP enabling the question 'how has the water quality improved since the Programme of Measures required by the WFD was implemented?' to be answered. This means that the requested data and maps will be essential for trend analysis, for policy development and for the assessment of policy effectiveness.

Statistics and information will be provided to the European Parliament at EU level. Information will be provided to the public through WISE.

3.5.2.1. Products from reporting

Note: for all relevant products, information on groundwater bodies will be presented by number of groundwater bodies and by size (area) as well as percentage.

Nb	Name of product	Type of product	Scale of information*	Detailed information displayed	Source of detailed information and aggregation rule	Used in 2012 reports?*
1	**Number, area and percentage of groundwater bodies of good chemical status and expected improvement**	Table	WB	Number, area and percentage of groundwater bodies of good chemical status and expected improvement since the first RBMPs.	Aggregation on the basis of the information provided at water body level.	Yes
2	**Drivers responsible for failure of good chemical status**	Table	RBD/SU	Number and area of groundwater bodies failing good chemical status due to each driver. Percentage of groundwater bodies failing good chemical status due to each driver in relation to total number of groundwater bodies failing good status.	Aggregation on the basis of the information on pressures provided at water body level.	It was not possible to produce (drivers were not reported unless linked to pressures reported at detailed level, which was optional)

[44] CIS Guidance Document No. 20: Exemptions to the Environmental Objectives: https://circabc.europa.eu/sd/a/2a3ec00a-d0e6-405f-bf66-60e212555db1/Guidance_documentN%C2%B020_Mars09.pdf

3	Chemical status of groundwater bodies	Chart	MS	Percentage of groundwater bodies of poor and good chemical status by area.	Aggregation on the basis of the information reported at water body level – water bodies with unknown status not included	Yes
4	Chemical status of groundwater bodies	Map	RBD	Percentage of groundwater area not achieving good chemical status.	Aggregation on the basis of the information reported at water body level – water bodies with unknown status not included.	Yes
5	Percentage of groundwater bodies not achieving good chemical status due to nitrate	Map	RBD	Percentage of groundwater body area not achieving good chemical status due to nitrate	Aggregation on the basis of the information reported at water body level – water bodies with unknown status not included.	Yes
6	Aggregation tables: Quantitative and chemical status of groundwater bodies	Table	MS/ RBD/SU	Number and size (area) of groundwater bodies by chemical status class.	Aggregation on the basis of the information reported at water body level.	Yes
7	Progress in achieving good chemical status since the first RBMP	Map/ Chart	MS/ RBD/SU	Number, area and percentage of water bodies which have achieved good chemical status since the first RBMPs.	Aggregation on the basis of the information reported at water body level.	Not relevant in 2010 reporting
8	Improvement in chemical status since the first RBMP	Map/ Chart	MS/ RBD/SU	Percentage of water bodies which have improved status since the first RBMP	Aggregation on the basis of the information reported at water body level.	Not relevant in 2010 reporting
9	Reasons behind Article 4(4) exemptions	Chart	MS	Exemptions reported by Member States to extend the deadline of the achievement of good status beyond 2015 and reasons given (natural condition, technical feasibility, disproportionate costs or combinations).	Aggregation on the basis of the information reported at water body level.	No
10	Instances where Article 4(2)c of the Groundwater Directive has been applied	Chart	MS/ RBD/SU	Number of groundwater bodies in which exceedances of quality standards and/or threshold values do not result in a failure of good chemical status	Aggregation on the basis of the information reported at water body level.	No
11	Percentage of groundwater bodies expected to be of good chemical status in 2015	Map/ Chart/ Table	EU/MS/RBD/ SU	Number, area and percentage of groundwater bodies expected to be of good chemical status in 2015.	Aggregation on the basis of the information reported at water body level.	No
12	Percentage of groundwater bodies at risk	Map/ Chart/ Table	EU/MS/RBD/ SU	Percentage of groundwater bodies at risk.	Aggregation on the basis of the information reported at water body level.	No

13	**Percentage of groundwater bodies subject to an environmentally significant and sustained anthropogenically induced upward trend**	Map/ Chart/ Table	EU/MS/RBD/ SU	Percentage of groundwater bodies showing a significant and sustained anthropogenically induced upward trend	Aggregation on the basis of the information reported at water body level.	No

Notes: * Scale of information: EU = European; MS = National, Member State; RBD = River Basin District; SU = Sub-unit; WB = water body; Site = monitoring site

3.5.3. Proposed contents of the 2016 reporting

3.5.3.1. Schema sketch

See Annex 10.3.

3.5.3.2. Information and data to be reported using the schemas

Information regarding the chemical status of groundwater bodies should be reported at groundwater body level according to the schema GWB.

Schema: GWB (continued)
Class: GroundWaterBody (continued) *Properties: maxOccurs = unbounded minOccurs = 1*
Schema element: gwAtRiskChemical **Field type / facets:** YesNoCode_Enum: Yes, No **Properties**: maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Report whether the groundwater body is at risk of failing to be of good chemical status. Please follow the approach given in the 'CIS Guidance Document No. 26: Risk assessment and the use of conceptual models'[45].
Schema element: gwEORiskChemical **Field type / facets:** EQORiskChemical_Enum: Uses or functions Surface waters / terrestrial ecosystems Both **Properties**: maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. If the groundwater body is at risk of failing

[45] CIS Guidance Document No. 26: Risk assessment and the use of conceptual models: https://circabc.europa.eu/sd/a/8564a357-0e17-4619-bd76-a54a23fa7885/Guidance%20No%2026%20-%20GW%20risk%20assessment%20and%20conceptual%20models.pdf

to be of good chemical status, select 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[46].

Quality checks: Conditional check: Report if gwAtRiskChemical is 'Yes'.

Schema element: gwChemicalStatusValue

Field type / facets: StatusCode_Enum: 2, 3, U

Properties: maxOccurs =1 minOccurs = 1

Guidance on completion of schema element: Required. Indicate the chemical status of the groundwater body, based on the most recently assessed status of the groundwater body.

'2' = Good status.

'3' = Poor status.

'U' = Unknown status.

Schema element: gwChemicalReasonsForFailure

Field type / facets: ReasonsForFailure_Enum:

Surface water

Groundwater dependent terrestrial ecosystems

Saline or other intrusion

Drinking Water Protected Area

General water quality assessment

Properties: maxOccurs =unbounded minOccurs = 0

Guidance on completion of schema element: Conditional. If the groundwater body is of poor chemical status, select reasons from the enumeration list:

'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

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

induced sustained changes in flow direction.

'Drinking Water Protected Area' = Deterioration in quality of waters for human consumption.

'General water quality assessment' = Significant impairment of human uses; significant environmental risk from pollutants across the groundwater body.

Further guidance can be found in CIS Guidance Document 18 on the Groundwater Status and Trends Assessment[47].

Quality checks: Conditional check: Report if gwChemicalStatusValue is '3'.

Schema element: gwChemicalAssessmentYear

Field type / facets: YearRangeType

Properties: maxOccurs =1 minOccurs = 1

Guidance on completion of schema element: Required. Provide the year on which the assessment of status is based. This may be the year that the groundwater body was monitored. In case of grouping this may be the year in which monitoring took place in the surface water bodies within a group that are used to extrapolate results to non-monitored groundwater bodies within the same group. A period is possible (e.g. 2011--2013).

Schema element: gwChemicalAssessmentConfidence

Field type / facets: Confidence_Enum: 0, 1, 2, 3

Properties: maxOccurs =1 minOccurs = 1

Guidance on completion of schema element: Required. Indicate the confidence on the chemical status assigned.

'0' = No information.

'1' = Low confidence (e.g. no monitoring data, or no conceptual model or understanding of the system).

'2' = Medium confidence (e.g. limited or insufficiently robust monitoring data and expert judgment plays a significant role in assessment of status).

'3' = 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).

The criteria used by Member States to assess confidence vary considerably, but the above examples provide some general guidance.

For further information, please see 'CIS Guidance Document No. 7: Monitoring under the Water Framework Directive'[48] and 'CIS Guidance Document No. 15: Groundwater monitoring'[49].

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

[48] https://circabc.europa.eu/sd/a/63f7715f-0f45-4955-b7cb-58ca305e42a8/Guidance%20No%207%20-%20Monitoring%20(WG%202.7).pdf

[49] https://circabc.europa.eu/sd/a/e409710d-f1c1-4672-9480-e2b9e93f30ad/Groundwater%20Monitoring%20Guidance%20Nov-2006_FINAL-2.pdf

Schema element: gwChemicalStatusExpectedGoodIn2015

Field type / facets: YesNoCode_Enum: Yes, No

Properties: maxOccurs =1 minOccurs = 1

Guidance on completion of schema element: Required. Indicate whether it is expected that this groundwater body will achieve good chemical status by the end of 2015.

This may differ from the data reported under GWChemicalStatusValue because the assessment of status contained in the RBMP will most likely be based on monitoring data from the period 2010-2014, given that the 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. Methodology of this assessment should be clearly explained in background documents (reference reported under classification methodologies).

If an Article 4(4) or Article 4(5) exemption for chemical status is applied then 'No' should be selected.

Quality checks: Within-schema check: If gwChemicalExemptionType is 'Article 4(4)...' or 'Article 4(5)…' , the option 'No' must be selected from the enumeration list.

Schema element: gwChemicalStatusExpectedAchievementDate

Field type / facets: GoodStatus_Enum:

2016--2021

2022--2027

Beyond 2027

Unknown

Less stringent objectives already achieved

Properties: maxOccurs =1 minOccurs = 0

Guidance on completion of schema element: Conditional. If good chemical status will NOT be achieved by 2015 (gwChemicalStatusExpectedGoodIn2015 is No), report the date by which it is expected that it will be achieved in full. The methodology of this assessment should be clearly explained in the RBMP or background documents (reference reported under classification methodologies). If good chemical status will not be achieved by 2015, exemptions should be applied. Please report the date by which it is expected that good chemical status will be achieved in full, not the date relating to individual exemptions. However, please note the following:

Article 4(4) exemptions relate to the extension of deadlines. According to Article 4(4)c of the WFD, postponing the achievement of objectives beyond 2027 is only possible due to natural conditions.

If Article 4(5) exemptions apply, report the date by when the less stringent objective is to be achieved. If the less stringent objective has already been achieved then select 'Less stringent objectives already achieved'.

Quality checks: Conditional check: report if gwChemicalStatusExpectedGoodIn2015 is 'No'.

Within-schema check: 'Less stringent objectives already achieved' is only a valid entry if 'Article 4(5)…' is reported under gwChemicalExemptionType.

The following class (child of GroundWaterBody) is used to report information about relevant pollutants at water body level. Report all pollutants and indicators for which one or more of the following circumstances occur in the relevant water body:

- The pollutant or indicator is causing risk of failure of chemical status (element gwPollutantCausingRisk)
- The pollutant or indicator is causing failure of chemical status due to exceedance of the relevant EQS or threshold value (element gwPollutantCausingFailure)
- The pollutant or indicator is showing an upward trend (element gwPollutantUpwardTrend)
- The pollutant or indicator is showing a trend reversal (element gwPollutantTrendReversal)
- The pollutant or indicator is showing exceedance(s) of the EQS or threshold value but after an appropriate investigation according to Article 4(2)(c) and Annex III of the Groundwater Directive the Member States considers that this does not result in a failure of chemical status (element gwPollutantExcedancesNotCounted)
- Background levels have been set for the pollutant or indicator (elements gwPollutantBackgroundLevelSet, gwPollutantBackgroundLevelValue and gwPollutantBackgroundLevelUnit)

Schema: GWB
Class: GWPollutant *Properties: maxOccurs =unbounded minOccurs = 0*
Schema element: gwPollutantCode Field type / facets: ChemicalSubstances_Union_Enum (see Annex 8e) Properties: maxOccurs = 1 minOccurs = 1 Guidance on completion of schema element: Required[50]. Select each pollutant and indicator for which one or more of the following circumstances occur in the relevant water body: • The pollutant or indicator is causing risk of failure of chemical status (element gwPollutantCausingRisk) • The pollutant or indicator is causing failure of chemical status due to exceedance of the relevant EQS or threshold value (element gwPollutantCausingFailure) • The pollutant or indicator is showing an upward trend (element gwPollutantUpwardTrend) • The pollutant or indicator is showing a trend reversal (element gwPollutantTrendReversal) • The pollutant or indicator is showing exceedance(s) of the EQS or threshold value but after an appropriate investigation according to Article 4(2)(c) and Annex III of the Groundwater Directive the Member States considers that this does not result in a failure of chemical status (element gwPollutantExcedancesNotCounted) • Background levels have been set for the pollutant or indicator (elements gwPollutantBackgroundLevelSet, gwPollutantBackgroundLevelValue and gwPollutantBackgroundLevelUnit)

[50] Please note that the multiplicity of the Class GWPollutant is 0 to many. Therefore, if there are no pollutants or indicators to report for the relevant water body, this whole class does not need to be reported.

Schema element: gwPollutantOther **Field type / facets**: string250Type **Properties**: maxOccurs = 1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. If 'gwPollutantCode' is 'EEA_00-00-0 Other chemical parameter' please indicate in this field the CAS number (if relevant) and the name of the pollutant or indicator. **Quality check**: Conditional check: report if 'gwPollutantCode' is 'EEA_00-00-0 Other chemical parameter'.
Schema element: gwPollutantCausingRisk **Field type / facets:** YesNoUnknownUnclear_Union_Enum: Yes, No, Unknown/unclear **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate if the pollutant or indicator is casing risk of failing to be of good chemical status in the relevant water body. **Quality checks**: If gwAtRiskChemical is 'Yes' then at least one pollutant or indicator should be reported as 'Yes' in gwPollutantCausingRisk.
Schema element: gwPollutantCausingFailure **Field type / facets:** YesNoCode_Enum: Yes, No **Properties**: maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate if the pollutant or indicator is causing failure to achieve good chemical status. **Quality checks**: If 'gwChemicalStatusValue' is '3' at least 1 pollutant or indicator should be reported as 'Yes' in 'gwPollutantCausingFailure'.
Schema element: gwPollutantUpwardTrend **Field type / facets:** YesNoUnknownUnclear_Union_Enum: Yes, No, Unknown/unclear **Properties**: maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element:** Required. Indicate whether there is a significant and sustained upward trend in the concentration of pollutant(s) or indicator(s) of pollution.
Schema element: gwPollutantTrendReversal **Field type / facets:** YesNoUnknownNotApplicableCode_Enum: Yes, No, Unknown, Not applicable **Properties**: maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether there is a trend reversal in the concentration of the pollutant(s) or indicator(s) of pollution. **Quality checks:** Within-schema check: the option 'Not applicable' is only valid if the element 'upwardTrend' is 'No'.
Schema element: gwPollutantsExceedancesNotCounted **Field type / facets:** YesNoCode_Enum: Yes, No

Properties: maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate if there are exceedances of the pollutant or indicator which are not considered as failures to achieving good chemical status (cases in which Article 4(2)c of the GWD applies).
Schema element: gwPollutantBackgroundLevelSet **Field type / facets**: YesNoCode_Enum: Yes, No **Properties**: maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether a background level of natural substances has been set.
Schema element: gwPollutantBackgroundLevelValue **Field type / facets:** String100Type Properties: maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. If a background level is set, report the numeric value or range of the natural background level. **Quality checks**: Conditional check: report if 'gwPollutantBackgroundLevelSet' is 'Yes'.
Schema element: gwPollutantBackgroundLevelUnit **Field type / facets:** UnitOfMeasure_Enum (see Annex 8f) **Properties**: maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. If a background level is set, select the relevant units for the natural background concentrations or levels (the reporting unit of Conductivity is milli Siemens per metre). **Quality checks**: Conditional check: report if 'gwPollutantBackgroundLevelSet' is 'Yes'.

The following class (child of GWPollutant) is used to report exemptions at pollutant level.

Schema: GWB (continued)
Class: GWChemicalExemptionType *Properties; max Occur: unbounded minOccur: 0* *Conditional: report if 'gwPollutantCausingFailure' is 'Yes'.*
Schema element: gwChemicalExemptionType **Field type / facets:** GWChemicalExemptionType_Union_Enum (see Annex 8g) **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Report which type(s) of exemption(s) apply if good chemical status is not expected to be achieved by 2015 for that pollutant or indicator. **Quality checks**:

Within-schema check: The option 'No exemption' is not compatible with any other. Therefore, if reported, no more instances of 'gwChemicalExemptionType' should be reported. The options 'Article4(7) - New modification' and 'Article4(7) - Sustainable human development' are not valid for groundwater chemical status and therefore cannot be reported.
Schema element: gwChemicalExemptionPressure **Field type / facets**: SignificantPressureType_Enum (see Annex 1a) **Properties:** maxOccurs = unbounded minOccurs = 0 **Guidance on completion of schema element**: Conditional. If any GWD Article 6(3) or WFD Article 4(4) or 4(5) exemptions apply to this groundwater body for chemical status, report the significant pressure(s) that are causing failure in order to justify the exemption(s). **Quality checks**: Conditional check: If gwChemicalExemptionType is not 'No exemption', at least one significant pressure type must be selected from the enumeration list. The options 'No significant pressure' and 'Not applicable' are not valid.

4. MONITORING (SCHEMA MONITORING)

4.1. Introduction

Article 8.1 of the WFD requires Member States to establish monitoring programmes for the assessment of the status of surface water and of groundwater in order to provide a coherent and comprehensive overview of water status within each RBD. These requirements include monitoring of Protected Areas as far as the status of surface water and groundwater is concerned. The results of monitoring play a key role in determining whether water bodies are of good status and what measures need to be included in the RBMPs in order to reach good status by 2015. Precise and reliable monitoring results are therefore a prerequisite for sound planning of investments in the Programmes of Measures (PoMs).

The WFD implementation reports required by Article 18 of the WFD should include, among other aspects, 'a review of the status of surface water and groundwater in the Community undertaken in co-ordination with the European Environment Agency'. In the first implementation report, this review was based on both the State of the Environment (SoE) information provided by EEA Member Countries[51] through the EIONET reporting process, and the status and pressure results reported at water body level (chapter 2 and 3 of this guidance) by Member States. Better streamlining between WFD and SoE reporting is still needed to ensure the most beneficial outcome of this two-level approach. For the second RBMPs, the review of status under Article 18 could significantly benefit from the inclusion of the WFD monitoring results on water quality data and biological data into the overall status assessment. Details could be included on the development of progress made since the first RBMPs, for example in the trends of status, pressures and impacts, and where objectives have not been fully met.

[51] http://bookshop.europa.eu/en/technical-report-on-groundwater-dep

Reporting should reflect the monitoring carried out that has informed the second RBMPs. Given that monitoring programmes are usually dynamic and multi-annual (i.e. in the cases of quality elements with lower frequencies of monitoring), reporting should reflect, as accurately as possible, the monitoring that has informed the preparation of the second RBMPs. **Reporting is not intended to include information regarding future monitoring programmes or planned changes**.

The selection of the quality elements (QEs) and parameters to be monitored should enable the detection of all significant pressures on water bodies. This is particularly important where the pressures and impacts assessments may not have been adequate enough to identify all potential pressures and impacts in the RBD, perhaps because of the lack of information or methods, or because of unexpected, anthropogenic activities within the RBD.

The results of surveillance monitoring should ensure that the potential impacts of all pressures on water bodies in the RBDs are detected. Incomplete coverage of QEs and water bodies in surveillance monitoring could lead to the non-detection of significant pressures, the incorrect classification of water status, and inappropriate targeting of measures. Surveillance monitoring must also be able to detect long-term natural changes and those arising from anthropogenic pressures.

The selection of biological quality elements (BQEs) for operational monitoring should focus on those most sensitive to the identified pressures and impacts on water bodies. The results of operational monitoring are used (together with the results of surveillance monitoring) in the classification of water bodies and to monitor progress of implemented measures in achieving the objectives of the Directive.

The results of monitoring are used in the assessment and classification of the status of water bodies (ecological and chemical for surface waters, chemical and quantitative for groundwater). The amount of monitoring undertaken in terms of QEs, parameters, frequency and numbers of monitoring sites should be sufficient to obtain a reliable and robust assessment of the status of all water bodies in the RBDs. Insufficient monitoring leads to a low confidence in the classification of water bodies and, as a result, the (expensive) measures required to achieve objectives may be incorrectly targeted, and/or objectives such as the restoration of water bodies to good status may not be achieved.

Directive 2009/90/EC[52] lays down technical specifications for the chemical analysis and monitoring of water status with the aim of improving the quality and comparability of monitoring results by establishing minimum performance criteria for methods of analysis to be applied by Member States when monitoring water status, sediment and biota, as well as rules for demonstrating the quality of analytical results.

4.1.1. How will the European Commission and the EEA use the information reported?

The European Commission will check comparability of the monitoring programmes between Member States, and consistency with the requirements of Annex V of the WFD and the outcome of the Article 5 analysis. Moreover, the European Commission will use this information to inform the

[52] http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1411979700659&uri=CELEX:32009L0090

European Parliament and the public about progress in the Member States in the implementation of the WFD. Finally, some of the base data are necessary to update a reference dataset with which monitoring results can be related and exchanged between the Member States and the European institutions more easily at a later stage.

Data on water quality, including from monitoring BQEs and Priority Substances, will be used by the EEA in producing trend assessments and overviews of the status of, and pressures affecting, Europe's surface waters and groundwater. The assessment of information reported in the second RBMPs will focus on illustrating improvement in status, and progress made in reducing pressures.

The wealth of information already reported by EEA Member Countries (including EU Member States) on water quality and BQEs via the EIONET water priority data flows (WISE-SoE) can be most effectively interpreted when streamlined with the WFD reporting. In the context of the implementation of the SEIS principles[53], monitoring results from the EIONET water monitoring sites which are also, in the main, WFD surveillance monitoring sites, can be used in the mutual exchange of information between the SoE and WFD assessments and provide a common basis for the assessment of status and pressures. The SoE assessments would be further enhanced with monitoring results from WFD operational monitoring sites.

Statistics and information will be provided to the European Parliament at EU level. Information will be provided to the public through WISE.

4.2. Products from reporting

Nb	Name of product	Type of product	Scale of information*	Detailed information displayed	Source of detailed information and aggregation rule	Used in 2012 reports?*
1	Surface water monitoring sites	Map	Site	Map of surface water monitoring sites by Category.	Geographical location of monitoring sites as reported.	Yes
2	Number of surveillance, operational and total monitoring sites by water category	Table	MS	Number of surveillance, operational and total monitoring sites per surface water Category. Number of surveillance, operational and quantitative monitoring sites for groundwater.	Aggregation on the basis of the information reported at monitoring site level.	Yes
3	Number of surveillance and operational monitoring sites per 1000 km2	Chart	MS	Number of surveillance and operational monitoring sites per 1000 km^2	Aggregation on the basis of the information reported at monitoring site level and total surface area of the RBD.	Yes

[53] SEIS – shared environmental information systems – collect once use multiple times

4	Number of monitoring sites in surface waters used for monitoring the different types of quality elements	Table	MS	Number of monitoring sites in surface waters used for monitoring the different types of quality elements (biological; hydromorphological; physico-chemical including non-priority specific pollutants; Priority Substances).	Aggregation on the basis of the information reported at monitoring site level.	Yes
5	Percentage of surface water bodies included in surveillance monitoring compared to total number of surface water bodies	Chart	MS	Percentage of surface water bodies included in surveillance monitoring compared to total number of surface water bodies.	Aggregation on the basis of the water body information reported at monitoring site level.	Yes
6	Number of river water bodies included in surveillance monitoring	Chart	MS	Number of river water bodies included in surveillance monitoring, benchmarked to criteria in WFD Annex V Section 1.3.1.	Aggregation on the basis of the water body information reported at monitoring site level. Benchmark is MS land area divided by 2500 km^2.	Yes
7	Percentage of surface water bodies in surveillance monitoring in which all relevant biological quality elements are monitored	Chart	MS	Percentage of surface water bodies in surveillance monitoring in which all relevant biological quality elements are monitored.	Aggregation on the basis of the water body information reported at monitoring site level.	Yes
8	Percentage of surface water bodies included in operational monitoring compared to surface water bodies with significant pressures	Chart	MS	Percentage of surface water bodies included in operational monitoring and compared to surface water bodies with significant pressures.	Aggregation on the basis of the water body information reported at monitoring site level.	Yes
9	Percentage of surface water bodies included in operational monitoring compared to total failing good ecological status	Chart	MS	Percentage of surface water bodies included in operational monitoring compared to total number of surface water bodies failing to achieve good ecological status.	Aggregation on the basis of the water body information reported at monitoring site and at water body level.	No

10	Number of operational sites in relation to the population density of the Member State	Chart	MS	Number of operational sites in relation to the population density of the Member State; population density is used as an indicator of the amount of potential pressure from human activity.	Aggregation on the basis of the water body information reported at monitoring site level.	Yes
11	Percentage of surface water bodies included in operational monitoring in which each biological quality element is measured	Chart	MS	Percentage of surface water bodies included in operational monitoring in which phytoplankton, other aquatic flora, macroinvertebrates and fish are monitored.	Aggregation on the basis of the water body information reported at monitoring site level.	Yes
12	Percentage of surface water bodies monitored and classified (on the basis of monitoring or extrapolation) for chemical status	Chart	MS	Percentage of surface water bodies classified for chemical status compared to the percentage of water bodies monitored for Priority Substances.	Aggregation on the basis of information reported at water body and monitoring site levels.	Yes
13	Percentage of surface water bodies in which each Priority Substance is monitored	Chart	MS	Percentage of surface water bodies in which each Priority Substance is monitored.	Aggregation on the basis of information reported at water body and monitoring site levels.	It was not possible to produce (reporting of individual priority substances was optional; in addition in many cases information was not available in RBMP or background documents; generally very poor reporting of chemical status reflecting implementation gaps)
14	Number of surface water monitoring sites per Priority Substance	Chart or table	EU/MS / RBD/SU	Number of monitoring sites per Priority Substance differentiating matrix and purpose (status and trend).	Aggregation on the basis of the water body information reported at monitoring site level.	No

15	Number of Priority Substances reliably monitored in surveillance and/or operational monitoring	Chart	MS	Number of Priority Substances monitored in accordance with QA/QC Directive performance requirements in surveillance and/or operational monitoring.	Aggregation of information reported at RBD level.	It was not possible to produce (necessary information on QA/QC Directive implementation was not included in reporting requirements because not yet implemented)
16	Priority Substances subjected to trend monitoring in sediment	Table	MS	Priority substances subjected to trend monitoring in sediment.	Aggregation of information reported at water body level.	It was not possible to produce (necessary information was not included in reporting requirements)
17	Priority Substances subjected to trend monitoring in biota	Table	MS	Priority Substances subjected to trend monitoring in biota (by MS)	Aggregation of information reported at water body level.	It was not possible to produce (necessary information was not included in reporting requirements)
18	Priority Substances showing upward trend in biota or sediment	Table	MS	Priority Substances showing upward trend in biota or sediment, with matrix	Aggregation of information reported at water body level.	It was not possible to produce (necessary information was not included in reporting requirements)
19	Groundwater monitoring sites	Map	Site	Map of groundwater monitoring sites for quantitative and chemical monitoring.	Geographical location of monitoring sites as reported.	Yes
20	Number of monitoring sites for quantitative and chemical groundwater monitoring	Chart	MS	Number of monitoring sites for quantitative and chemical groundwater monitoring.	Aggregation on the basis of the water body information reported at monitoring site level.	Yes

21	Density of groundwater monitoring sites for quantitative and chemical monitoring	Chart	MS	Number of groundwater monitoring sites per 1000km^2 of groundwater area for quantitative and chemical monitoring.	Aggregation on the basis of the information reported at monitoring site level and total surface area of the RBD.	Yes
22	Percentage of groundwater bodies in quantitative monitoring	Chart	MS	Percentage of groundwater bodies included in quantitative monitoring.	Aggregation on the basis of the water body information reported at monitoring site level.	Yes
23	Number of monitoring sites per groundwater body for quantitative monitoring	Chart	EU	Number of groundwater bodies with 0, 1, 2-5, 6-10, and 11 and more monitoring sites for quantitative monitoring.	Aggregation on the basis of the water body information reported at monitoring site level.	Yes
24	Percentage of groundwater bodies in chemical surveillance monitoring	Chart	MS	Percentage of groundwater bodies in chemical surveillance monitoring.	Aggregation on the basis of the water body information reported at monitoring site level.	Yes
25	Groundwater bodies included in chemical surveillance monitoring where all core parameters are monitored	Chart	MS	Percentage of groundwater bodies included in chemical surveillance monitoring where all core parameters are monitored.	Aggregation on the basis of the information reported at monitoring site level.	Yes
26	Percentage of groundwater bodies in chemical operational monitoring	Chart	MS	Percentage of groundwater bodies in chemical operational monitoring.	Aggregation on the basis of the water body information reported at monitoring site level.	Yes
27	Relative number of groundwater bodies included in operational monitoring and those with significant pressures	Chart	MS	Relative number of groundwater bodies included in operational monitoring and those with significant pressures.	Aggregation on the basis of the water body information reported at monitoring site level.	Yes
28	Number of monitoring sites per groundwater body for chemical monitoring	Chart	EU	Number of groundwater bodies with 0, 1, 2-5, 6-10, and 11 and more monitoring sites for chemical monitoring.	Aggregation on the basis of the water body information reported at monitoring site level.	Yes

29	Trend in median (a) total ammonium, (b) total phosphorus and (c) nitrate concentration of river water bodies, grouped by ecological status/poten-tial class	Chart	EU	WFD water body information linked with WISE-SoE long time series data on water quality in rivers for (a) total ammonium, (b) total phosphorus and (c) nitrate concentration. The trend in water quality is presented for each ecological class and extrapolated to 2027 to illustrate if water bodies of moderate to poor ecological status will approach high or good ecological status.	Aggregation on the basis of the information reported at water body level combined with information on river water quality from the WISE-SoE database.	Yes

Notes: * Scale of information: EU = European; MS = National, Member State; RBD = River Basin District; SU = Sub-unit; WB = water body; Site = monitoring site

Example of combining water quality results with information on ecological status and potential – more examples are available in ETC/ICM 2012[54].

Figure 3 Rivers: Concentration range (1st quartile, median and 3rd quartile) of annual average nutrient concentrations in river water bodies in different classes of ecological status or potential (high to bad)

Notes: Average of mean annual water quality concentration values over the years 2005-2010. Based on results from 3368 WISE-SoE river monitoring sites in 16 Member States, dominated by river monitoring sites in France (1416 sites) and the UK (555 sites).

4.3. Contents of the 2016 reporting

The data and information on monitoring to be reported under Article 8 of the WFD include a description of the monitoring sites, a specification of the different QEs and chemical substances monitored at each site, and information relating to the associated monitoring programmes.

54 http://icm.eionet.europa.eu/ETC_Reports/EcoChemStatusPressInEurWaters_201211/Ecological_and_chemical_status_and_pressures_ETC_13112012_Published.pdf

Figure 4 presents a conceptual overview of the monitoring data reported under the WFD and the monitoring results reported to the EEA (WISE-SoE). In both reporting streams, the monitoring sites have a unique site code, which allows the information to be joined with the spatial data and additional information reported in the common WISE Spatial Data reporting flow.

Figure 4: Conceptual overview of reporting of WFD monitoring metadata (Article 8) and reporting monitoring results to EEA WISE SoE

Member States are expected to report to EEA WISE SoE:

- Water quality results including Priority Substances and River Basin Specific Pollutants to EEAs Waterbases on groundwater, rivers, lakes, transitional waters and coastal waters
- Results from monitoring Biological Quality Elements to EEAs Waterbases on rivers, lakes, transitional waters and coastal waters

The reporting requirements are further described in the Reporting Obligations Database (ROD)[55]

The information reported under the WISE Spatial Data flow provides the common reference spatial data sets for monitoring sites and water bodies. This information is shered across thematic data to ensure consistency between the different water related directives (WFD, NiD, UWWT, Bathing Water) and WISE-SoE.

4.3.1. Schema sketch

See Annex 10.4.

[55] http://rod.eionet.europa.eu/.

4.3.2. Data and information to be reported using the schemas

Information regarding monitoring programmes should be reported at RBD level.

Schema: Monitoring
Class: Programme *Properties: maxOccurs = unbounded minOccurs = 1*
Schema element: euProgrammeCode Field type / facets: FeatureUniqueEUCodeType Properties: maxOccurs = 1 minOccurs = 1 Guidance on completion of schema element: Required. Unique EU code of the monitoring programme. Prefix the monitoring programme's national, unique code with the Member State's 2-alpha character ISO country code. The same code reported in 2007 and 2010 should be used for monitoring programmes still in existence. Quality checks: Element check: First 2 characters must be the Member State's 2-alpha character ISO country code. Within-schema check: euProgrammeCode must be unique.
Schema element: programmeName Field type / facets: String250Type Properties: maxOccurs =1 minOccurs = 1 Guidance on completion of schema element: Required. Readily understandable name of the monitoring programme in English that is meaningful outside of the RBD or Member State. It should reflect its purpose, such as surveillance, operational, investigative or drinking water monitoring programme, and the water categories in which it is undertaken.
Schema element: programmeCategoryRW Field type / facets: YesNoCode_Enum: Yes, No Properties: maxOccurs =1 minOccurs = 1 Guidance on completion of schema element: Required. Indicate if this monitoring programme is used for rivers.
Schema element: programmeCategoryLW Field type / facets: YesNoCode_Enum: Yes, No Properties: maxOccurs =1 minOccurs = 1 Guidance on completion of schema element: Required. Indicate if this monitoring programme is used for lakes.
Schema element: programmeCategoryTW Field type / facets: YesNoCode_Enum: Yes, No Properties: maxOccurs =1 minOccurs = 1 Guidance on completion of schema element: Required. Indicate if this monitoring programme is

used for transitional waters.
Schema element: programmeCategoryCW **Field type / facets:** YesNoCode_Enum: Yes, No **Properties**: maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate if this monitoring programme is used for coastal waters.
Schema element: programmeCategoryTeW **Field type / facets:** YesNoCode_Enum: Yes, No **Properties**: maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate if this monitoring programme is used for territorial waters.
Schema element: programmeCategoryGW **Field type / facets:** YesNoCode_Enum: Yes, No **Properties**: maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate if this monitoring programme is used for groundwater.
Schema element: programmeReference **Field type / facets:** ReferenceType (see Annex 9) **Properties**: maxOccurs = unbounded minOccurs = 1 **Guidance on completion of schema element:** Required. Provide references or hyperlinks to the documents and sections where relevant information relating to the monitoring programmes can be found. Guidance on what should be included in this document is provided in Section 4.3.4.

The following class is used to provide information on the surface and groundwater monitoring sites.

Schema: Monitoring (continued)
Class: MonitoringSite ***Properties**: maxOccurs = unbounded minOccurs = 1*
Schema element: euMonitoringSiteCode **Field type / facets:** FeatureUniqueEUCodeType

Properties: maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Unique EU code of the surface water monitoring site. Prefix the surface water monitoring site's national, unique code with the Member State's 2-alpha character ISO country code[56]. **Quality checks**: Element check: First 2 characters must be the Member State's 2-alpha character ISO country code. Within-schema check: euMonitoringSiteCode must be unique.
Schema element: euMonitoringSiteName **Field type / facets:** String250Type **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Readily understandable name of the monitoring site in English that is meaningful outside of the RBD or Member State.
Schema element: euWaterBodyCode **Field type / facets:** FeatureUniqueEUCodeType **Properties**: maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Unique EU code of the surface or groundwater body as reported in the SWB or GWB schemas in which the monitoring site is physically located in or near (in the rare cases where the monitoring site is not physically located in the water body). **Quality checks**: Cross-schema check: The water body code must be included in SWB/SurfaceWaterBody/euSurfaceWaterBodyCode or in GWB/GroundWaterBody/euGroundWaterBodyCode.
Schema element: waterCategory **Field type / facets:** WaterCategory_Enum: RW, LW, TW, CW, TeW, GW **Properties**: maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Report the water category of the water body that is monitored (where the site is physically located in or near). **Quality checks**: if 'waterCategory' is 'GW' then 'euWaterBodyCode' should be included in GWB/GroundWaterBody/euGroundWaterBodyCode.
Schema element: ecologicalMonitoring **Field type / facets:** YesNoNotApplicable_Union_Enum: Yes, No, Not applicable **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether the monitoring site is used

[56] Member State's 2-alpha character ISO country code: http://publications.europa.eu/code/en/en-370100.htm (Note: for Greece use 'EL' and United Kingdom use 'UK')

for ecological monitoring. For groundwater monitoring sites report 'Not applicable' **Quality checks**: Within-schema check: 'Not applicable' must be selected if 'waterCategory' is 'GW'.
Schema element: chemicalMonitoring **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether the surface or groundwater monitoring site is used for chemical monitoring.
Schema element: quantitativeMonitoring **Field type / facets:** YesNoNotApplicable_Union_Enum: Yes, No, Not applicable **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether the groundwater monitoring site is used for quantitative monitoring. For surface water monitoring sites report 'Not applicable' **Quality checks**: Within-schema check: 'Not applicable' must be selected if 'waterCategory' is not 'GW'.
Schema element: quantitativeFrequency **Field type / facets:** nonNegativeInteger **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. If the groundwater monitoring site is used for quantitative monitoring, report the frequency of monitoring. Further guidance on what should be reported is provided in the glossary in section 4.3.5. **Quality checks**: Conditional check: Report if 'quantitativeMonitoring' is 'Yes'.
Schema element: quantitativeCycle **Field type / facets:** nonNegativeInteger **Properties**: maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. If the groundwater monitoring site is used for quantitative monitoring, report the cycle of monitoring. Further guidance on what should be reported is provided in the glossary in section 4.3.5. **Quality checks**: Conditional check: Report if 'quantitativeMonitoring' is 'Yes'.
Schema element: quantitativeLastMonitored **Field type / facets:** YearRangeType **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. If the groundwater monitoring site is used for quantitative monitoring, report the most recent year in the format YYYY that was monitored. Enter 9999 if parameter has yet to be measured. **Quality checks**: Conditional check: Report if 'quantitativeMonitoring' is 'Yes'.

Schema element: wellSpring **Field type / facets:** WellSpring_Enum:Well, Spring, Other **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. For groundwater sites, indicate whether the groundwater monitoring site is a well, spring or other. **Quality checks**: Conditional check: report it 'waterCategory' is 'GW'
Schema element: depth **Field type / facets:** MonitoringDepth_Enum:Upper, Medium, Lower, Mixed **Properties**: maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. For groundwater monitoring sites, indicate the groundwater layer within the groundwater body in which sampling occurs. Please see visualization of multi-layered GWBs in sections 1.3 and 2.3 of Annex 4. **Quality checks**: Conditional check: report it 'waterCategory' is 'GW'

The following class (child of MonitoringSite) is used to report each QE monitored at the surface water monitoring site:

Schema: Monitoring (continued)
Class SWEcologicalMonitoring *Properties: maxOccurs = unbounded minOccurs = 0* *Conditional check: report at least 1 if ecologicalMonitoring is 'Yes'*
Schema element: qeCode **Field type / facets:** QualityElement_Enum (see Annex 8h) **Properties**: maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required[57]. Select all the quality elements (QEs) monitored at this surface water monitoring site from the enumeration list.
Schema element: qeDescription **Field type / facets:** String100Type **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. If 'QE1-5 - Other species' has been selected from the enumeration list and reported under qualityElementCode, provide the name of the other QE(s) monitored at this surface water monitoring site **Quality checks**: Conditional check: Report if 'QE1-5 - Other species' is selected from the

[57] Please note that the multiplicity of the Class SWEcologicalMonitoring is 0 to many. Therefore, if there are no quality elements monitored at this site this whole class does not need to be reported.

enumeration list under qualityElementCode.
Schema element: qeFrequency **Field type / facets:** nonNegativeInteger **Properties**: maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Report the frequency at which each QE is monitored at this surface water monitoring site. Further guidance on what should be reported is provided in the glossary in section 4.3.5.
Schema element: qeCycle **Field type / facets:** nonNegativeInteger **Properties**: maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Report the monitoring cycle relating to each QE monitored at this surface water monitoring site. Further guidance on what should be reported is provided in the glossary in section 4.3.5.
Schema element: qeLastMonitored **Field type / facets:** YearRangeType **Properties**: maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Report the most recent year in the format YYYY that each QE was monitored at this surface water monitoring site. Enter 9999 if the QE has yet to be measured.

The following class (child of MonitoringSite) is used to report each chemical substance monitored at the surface or groundwater monitoring site:

Schema: Monitoring (continued)
Class ChemicalMonitoring ***Properties:*** *maxOccurs = unbounded minOccurs = 0* *Conditional check: report at least 1 if 'chemicalMonitoring' is 'Yes'*
Schema element: chemicalSubstanceCode **Field type / facets:** ChemicalSubstances_Union_Enum (see Annex 8e) **Properties**: maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Report each chemical substance or parameter which is monitored at this site. Please note that, as regards surface waters and according to the WFD, Priority Substances are included in the assessment of chemical status and non-priority River Basin Specific Pollutants are included in the assessment of ecological status. However, for the sake of simplicity in the reporting of monitoring data, they are required to be reported together.Please note that the following pollutants and parameters are only valid for groundwater (for surface waters most of them are

included in ecological status or, in the case of pesticides, can be reported individually): Hardness, Water temperature, Dissolved oxygen, CODMn, Total organic carbon (TOC), Chloride, Sulphate, Electrical conductivity, pH, Hydrogen carbonate (bicarbonate) HCO3, Acid capacity to pH 4.5, Nitrate, Total phosphorus, Pesticides (active substances in pesticides, including their relevant metabolites, degradation and reaction products) – Total.
Schema element: chemicalSubstanceOther **Field type / facets:** String100Type **Properties**: maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. If 'chemicalSubstanceCode' is 'Other' please indicate in this field the CAS number (if relevant) and the name of the chemical substance. **Quality checks**: Conditional check: report if 'chemicalSubstanceCode' is 'EEA_00-00-0 – Other chemical parameter'.
Schema element: chemicalMatrix **Field type / facets:** Matrix_Enum: Water Biota Biota - fish Biota - other Sediment Sediment - suspended sediment Sediment - settled sediment **Properties**: maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Report the matrix in which each chemical substance is monitored. For groundwater monitoring sites report 'Water'.
Schema element: chemicalPurpose **Field type / facets:** ChemicalPurpose_Enum: Status, Trend, Both **Properties**: maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Report if the chemical monitoring is used for status assessment, trend assessment or both.
Schema element: chemicalFrequency **Field type / facets:** nonNegativeInteger **Properties**: maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Report the frequency at which each chemical substance is monitored at this monitoring site. Further guidance on what should be reported is provided in the glossary in section 4.3.5.
Schema element: chemicalCycle

Field type / facets: nonNegativeInteger **Properties**: maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Report the monitoring cycle relating to each chemical substance monitored at this monitoring site. Further guidance on what should be reported is provided in the glossary in section 4.3.5.
Schema element: chemicalLastMonitored **Field type / facets:** YearRangeType **Properties**: maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Report the most recent year in the format YYYY that each chemical substance was monitored at this monitoring site. Enter 9999 if the chemical substance has yet to be measured.

The following class (child of MonitoringSite) is used to report the purpose and the programme that is linked to it:

Schema: Monitoring (continued)
Class MonitoringPurpose ***Properties:*** *maxOccurs = unbounded minOccurs = 1*
Schema element: monitoringPurpose **Field type / facets:** MonitoringPurpose_Enum (see Annex 8i) **Properties**: maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Report each monitoring purpose of each monitoring site.
Schema element: euProgrammeCode **Field type / facets:** FeatureUniqueEUCodeType **Properties**: maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Report the EU monitoring programme code under which the relevant purpose is implemented in this site. **Quality check**: Element check: First 2 characters must be the Member State's 2-alpha character ISO country code. Within-schema check: the code must be included in *Monitoring/Programme/euProgrammeCode*

4.3.3. GIS information

The location of monitoring sites needs to be reported separately as GML files (see Annex 5 GIS guidance for further information).

4.3.4. Guidance on contents of RBMPs and background documents

The following provides guidance on the aspects that the European Commission expects to find in the relevant chapters on monitoring in the RBMPs or in background documents. This guidance is not intended to be comprehensive in terms of what the Member States have to include in their RBMPs or background documents, rather to provide certain concrete elements of information that the European Commission expects to find.

The RBMPs or background documents should include:

- Summaries of the significant changes in the monitoring programmes undertaken since the first reporting exercise in 2007, the first RBMPs in 2010, those used to inform the development of the second RBMPs up to 2015, and those planned to be undertaken up to 2021.

- Detailed information on the design of each type of monitoring programme, including the objectives of monitoring, QEs selected, the rationale for the number and location of monitoring sites chosen, the level of confidence and precision, etc.

Surface Waters

- Which of the requirements and objectives laid down in Annex V 1.3.1 of the WFD are incorporated into the design of the surveillance monitoring programme for surface waters? To provide information for:

  - supplementing and validating the impact assessment procedure detailed in Annex II,

  - the efficient and effective design of future monitoring programmes,

  - the assessment of long-term changes in natural conditions,

  - the assessment of long-term changes resulting from widespread anthropogenic activity,

  - an assessment of the overall surface water status within each catchment or sub-catchments within the RBD.

- Surveillance monitoring requires that parameters indicative of all BQEs, all hydromorphological QEs, all general physicochemical QEs, and (conditionally) priority list pollutants which are discharged into the river basin or sub-basin, and (conditionally) other pollutants discharged in significant quantities in the river basin or sub-basin, are monitored. How have water bodies and QEs been selected for surveillance monitoring (e.g. in relation to all potential pressures, on the basis of emissions inventories)?

- The reasons for the exclusion of any QEs that are not monitored in water bodies included in surveillance monitoring (e.g. lack of suitable method, practical considerations, scientific justification).

- The operational monitoring programme should respond to the significant pressures identified in the pressures and impacts analysis required under Article 5 of the WFD. Which

BQEs are selected in the operational monitoring programme to respond to different pressures and impacts? Please present a table similar to the following:

Biological Quality Elements used in operational monitoring (indicate in each cell the relevant BQEs from the enumeration list in Annex 8h):

Impact	Rivers	Lakes	Transitional waters	Coastal waters
Nutrient pollution				
Organic pollution				
Chemical contamination of water				
Chemical contamination of sediment				
Saline pollution				
Acidification				
Elevated temperatures				
Altered habitats as a result of hydrological and morphololgical alterations				
Other impacts				

- How are Priority Substances monitored in sediments and/or biota to assess long-term trends of Priority Substances? Article 3.3 of Directive 2008/105/EC[58] (Article 3.6 in the current version as amended by Directive 2013/39/EU[59]) states that 'Member States shall determine the frequency of monitoring in sediment and/or biota so as to provide sufficient data for a reliable long-term trend analysis. As a guideline, monitoring should take place every three years, unless technical knowledge and expert judgment justify another interval.' Indicate the Priority Substances for which the monitoring of long-term trends is undertaken and in how many stations, with the matrices used and frequencies applied.

- The WFD allows the grouping of water bodies for monitoring and assessment. Only similar types of water bodies can be grouped, for example, where the ecological conditions are similar, or almost similar, and in terms of the magnitude and type of pressure or combination of pressures on the water bodies. In all cases, grouping must be technically or scientifically justifiable. Also, the monitoring of sufficient indicative or representative water bodies in the sub-groups of surface water or groundwater bodies would have to provide for an acceptable level of confidence and precision in the results of monitoring, and in particular the classification of water body status. Explain and justify the basis for grouping,

[58] Directive 2008/105/EC of the European Parliament and of the Council of 16 December 2008 on environmental quality standards in the field of water policy, amending and subsequently repealing Council Directives 82/176/EEC, 83/513/EEC, 84/156/EEC, 84/491/EEC, 86/280/EEC and amending Directive 2000/60/EC of the European Parliament and of the Council

[59] Directive 2013/39/EU of the European Parliament and of the Council of 12 August 2013 amending Directives 2000/60/EC and 2008/105/EC as regards priority substances in the field of water policy

the categories of water bodies to which grouping has been applied and the extent of the application. Explain any differences in methodology between water categories.

- A summary of how the requirements associated with surface water and groundwater Drinking Water Protected Areas have been incorporated into the monitoring programmes for the WFD.

- A summary of transboundary monitoring networks for surface water and groundwater bodies, including transboundary countries that are not part of the EU.

Groundwater

- For surveillance monitoring, Annex V of the WFD requires Member States to monitor a set of core parameters in all groundwater bodies and parameters indicative of pressures in groundwater bodies identified as being at risk. In the case of operational monitoring, Member States should monitor only those parameters which are indicative of the pressures to which the body is subject. How have the parameters in groundwater monitoring programmes been selected to respond to different pressures and impacts?

- How are groundwater chemical status monitoring programmes designed in order to detect significant and sustained upward trends in pollutants? Indicate which of the following aspects were incorporated into the monitoring programmes, and how:

    - Trend assessment only carried out in groundwater bodies at risk of not meeting WFD Environmental Objectives,

    - Trend assessment on groundwater bodies not currently at risk in order to distinguish long-term trends both as a result of changes in natural conditions and through anthropogenic activity.

    - Trend assessment based on surveillance and operational monitoring data from individual monitoring sites.

    - Statistical method for assessing trends at each monitoring site (statistical method adapted to initial conditions such as regression analysis for normal distributions and non-parametric tests for non-normal distributed time series).

    - Individual parameter concentrations (or values) below the Limit of Quantification (LOQ) replaced by half of the value of the highest LOQ occurring in the time series being analysed.

    - How were upward trends identified in sufficient time to allow measures to be implemented?

    - Length of time series considered to be appropriate to detect significant trends.

    - How were baseline levels for substances which occur both naturally and from anthropogenic sources considered?

- How was it ensured that upward trends can be distinguished from natural variation with an adequate level of confidence and precision?
- What was considered to be an acceptable level of confidence in the trend assessment?

4.3.5. Glossary: clarification of terms and reporting requirements

The Frequency and Cycle elements are used together to describe the frequency at which the QEs or chemical substances at surface water monitoring sites, or chemical parameters at groundwater monitoring sites, are monitored.

Frequency is the number of determination or sampling events made in a year when monitoring is undertaken. For example, '12' equates to approximately 12 monthly determinations, '4' equates to determinations approximately every 3 months, '2' equates to determinations approximately every 6 months or twice a year, and '1' equates to 1 determination in the year.

Cycle is the period (years) between the years when monitoring is undertaken within the 6 year planning cycle. For example, '1' indicates that the element will be monitored every year in the 6 year cycle, '2' is once every 2 years (i.e. 3 times in the cycle), and '3' is once every 3 years (i.e. twice in the cycle). '0' should be used to indicate that the monitoring programme will be implemented once per cycle and, depending on the results, future monitoring will be decided.

Some QEs (e.g. QE2-1 Hydrological regime: rivers) or parameters (e.g. groundwater level) are measured continuously. In these cases, enter '365' in the Frequency element and '1' in the Cycle element.

Some examples are given below.

Frequency	Cycle	Description
12	1	The element is determined monthly every year
1	2	The element is determined once every two years
12	0	The element is determined monthly for one year only (i.e. the cycle is not repeated)
365	1	The element is determined daily every year or continuously (e.g. water table level or river flow)

5. PROTECTED AREAS (SCHEMAS SWB AND GWB)

5.1. Introduction

According to Article 6 and Annex IV of the WFD, Member States shall ensure the establishment of a register or registers of all areas lying within each RBD which have been designated as requiring special protection under specific Community legislation for the protection of their surface water

and groundwater, or for the conservation of habitats and species directly depending on water, including the protection of Natura 2000 sites and economically significant aquatic species (e.g. shellfish).

A summary of the register of Protected Areas should be part of the RBMPs, including maps indicating the location of each Protected Area and a description of the Community, national or local legislation under which the Protected Areas have been designated. **It is expected that all Protected Areas will be reported under the surface water body (SWB) and groundwater body (GWB) schemas**, through their links to the surface and groundwater bodies[60].

The relevant EU legislation for the protection of water with more stringent objectives includes the following directives:

- Drinking Water Directive (80/778/EEC, as amended by Directive 98/83/EC).
- Shellfish Directive (2006/113/EC)[61].
- Freshwater Fish Directive (2006/44/EC)[62].
- Bathing Water Directive (2006/7/EC)[11].
- Nitrates Directive (91/676/EEC)[9].
- Urban Wastewater Treatment Directive (91/271/EEC)[8].
- Birds Directive (2009/147/EC)[63].
- Habitats Directive (92/43/EEC)[64].

The Freshwater Fish Directive and the Shellfish Directive were repealed on 22 December 2013. According to the WFD, the level of protection should be maintained through the inclusion of the designated areas as Protected Areas under WFD. The necessary additional objectives and measures should be included in the RBMPs and PoMs.

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60 If the Member State applies a 'whole territory' approach for Urban Waste Water Treatment and/or Nitrates Directive, it should not report surface water bodies as Protected Areas.

61 Directive 2006/113/EC of the European Parliament and of the Council of 12 December 2006 on the quality required of shellfish waters http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32006L0113&from=EN

62 Directive 2006/44/EC of the European Parliament and of the Council of 6 September 2006 on the quality of fresh waters needing protection or improvement in order to support fish life http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32006L0044&qid=1439559844301&from=EN

63 Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32009L0147&qid=1439559916722&from=EN

64 Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31992L0043&qid=1439559990883&from=EN

For water bodies which are designated as Protected Areas, the Environmental Objectives set are beyond good status, as more stringent objectives have been set for those areas in the relevant Community legislation.

Annex VII (7)(1) of the WFD requires that the RBMPs contain 'a summary of the measures required implementing Community legislation for the protection of water'. The additional measures for Protected Areas should be an integral part of the RBMPs in order to ensure that the requirements of those Protected Areas are included in the overall management of the RBDs and to ensure the coherence of the entire water planning with the objectives already established by other Community and national legislation.

Article 4.1(c) of the WFD states that 'Member States shall achieve compliance with any standards and objectives at the latest 15 years after the date of entry into force of this Directive, unless otherwise specified in the Community legislation under which the individual Protected Areas have been established'. Therefore, water bodies in the Protected Areas must be of good status by 2015 at the latest, and earlier if required by another piece of Community legislation. If a water body is not of good status then it would be expected that an exemption under Article 4.4 of the WFD has been applied.

The additional measures can be of the same nature as those for the WFD (e.g. measures to reduce nitrogen loss from agriculture, or measures to improve the hydromorphological status in a river) but they need to reach a higher level of improvement of status. Alternatively, they may need to address different aspects of pollution which are not included in the WFD definition of good status (e.g. microbiological standards for the protection of shellfish and bathing waters). There can also be different kinds of measures targeted towards the specific objectives for the protection of the area.

As with any other WFD Environmental Objective, exemptions may apply provided the conditions in the relevant Articles are fulfilled. In the case of Protected Areas, it needs to be ensured that the WFD exemptions do not undermine the objectives under the relevant legislation. Reporting of exemptions linked to Protected Areas refer only to the additional objectives set (e.g. based on Article 4(1)(c). Exemptions from the WFD Environmental Objectives in Articles 4(1)(a) and 4(1)b are reported in the context of the reporting of the relevant status of surface or groundwater (see relevant parts of sections 2 and 3).

5.1.1. How will the European Commission and the EEA use the information reported?

The European Commission will use the information reported by Member States on Protected Areas to ensure that a register of Protected Areas has been established in the RBD, and that the appropriate levels of protection are in place. Statistics and information will be provided to the European Parliament at EU level. Information will be provided to the public through WISE.

5.2. Products from reporting

Nb	Name of product	Type of product	Scale of information*	Detailed information displayed	Source of detailed information and aggregation rule	Used in 2012 reports?*
1	Number of Protected Areas of each type	Table	MS	Number of Protected Areas of each type reported.	Aggregation on the basis of the reported register of Protected Areas.	Yes

Nb	Name of product	Type of product	Scale of information*	Detailed information displayed	Source of detailed information and aggregation rule	Used in 2012 reports?*
2	Number of Protected Areas	Chart	MS	Number of Protected Areas of each type.	Aggregation on the basis of the information reported at Protected Area level.	Yes
3		Table	MS	Number of protected areas (by type) achieving objectives	Aggregation on the basis of the information reported at Protected Area level.	No

Notes: * Scale of information: EU = European; MS = National, Member State; RBD = River Basin District; SU = Sub-unit; WB = water body; Site = monitoring site

5.3. Contents of the 2016 reporting

5.3.1. Schema sketch

See Annex 10.2 (for surface water bodies schema SWB) and Annex 10.3 (for groundwater bodies schema GWB).

5.3.2. Data and information to be provided using the schemas

Information regarding Protected Areas associated with surface water bodies should be reported at surface water body level according to the schema SWB (see Introduction and section 5.3.4 Glossary for further explanation).

Schema: SWB (continued)
Class SWAssociatedProtectedArea *Properties: maxOccurs = unbounded minOccurs = 0* *Conditional check: report at least 1 if 'swAssociatedProtectedArea' is 'Yes'*
Schema element: euProtectedAreaCode Field type / facets: FeatureUniqueEUCodeType

Properties: maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required[65]. Unique EU code(s) of the (water-dependent) Protected Area(s) associated to the surface water body. If applicable, report the code of the Protected Area as previously reported under other directives. If it has not been reported under other Directives, report the code reported under the GML schema ProtectedAreas (see Annex 5 GIS guidance). If not already included in the first two characters of the code when reported under other directives, prefix the unique code with the Member State's 2-alpha character ISO country code. **Quality checks**: Element check: First 2 characters must be the Member State's 2-alpha character ISO country code. Cross-schema check: the reported euProtectedAreaCode must be consistent with the codes reported in ProtectedArea/thematicIdIdentifier.
Schema element: protectedAreaType **Field type / facets:** ProtectedAreaType_Enum: Bathing Birds Fish Shellfish Habitats Urban Waste Water Treatment Directive Sensitive Area Nitrates Article 7 Abstraction for Drinking Water Other **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Report the type for each Protected Area related to the surface water body. If the Member State applies a 'whole territory' approach for Urban Waste Water Treatment and/or Nitrates Directive, surface water bodies should not be reported as Protected Areas.
Schema element: protectedAreaOtherType **Field type / facets:** String250Type **Properties:** maxOccurs =unbounded minOccurs = 0 **Guidance on completion of schema element**: Conditional. If the type of Protected Area is reported as 'Other', provide more information.

[65] Please note that the multiplicity of the Class SWAssociatedProtectedArea is 0 to many. Therefore, if there are no associated protected areas to report for the relevant water body, this whole class does not need to be reported

Quality checks: Conditional check: Report if 'protectedAreaType' is 'Other'.

Schema element: protectedAreaAssociationType

Field type / facets: ProtAreaAssociationType_Enum:

Within Protected Area

Overlapping / partly within Protected Area

Dynamically / hydrologically connected with Protected Area

Properties: maxOccurs =1 minOccurs = 1

Guidance on completion of schema element: Required. Report the type of association that the surface water body has with the Protected Area. The boundaries of surface water bodies and Protected Areas will not always directly coincide with each other.

'Within Protected Area' = The surface water body is located entirely within the Protected Area. The Protected Area may be associated with more than one surface water body.

'Overlapping / partly within Protected Area' = The surface water body overlaps or is located partly within the Protected Area, or overlaps more than one Protected Area.

'Dynamically / hydrologically connected with Protected Area' = The surface water body is dynamically or hydrologically connected with the Protected Area without being located entirely or partly within it.

Schema element: protectedAreaHabitatsBirdsObjectivesSet

Field type / facets: ProtectedAreaHabitatsBirdsObjective_Enum:

Yes, specific water objectives have been set to protect all water dependent habitats and species.

Yes, some specific water objectives have been set to protect water dependent habitats and species but work is still on-going to determine needs.

No, no specific water objectives have been set to protect water dependent habitats and species because the achievement of WFD good status is sufficient to achieve favourable conservation status.

No, no specific water objectives have been set to protect water dependent habitats and species because additional needs are not known.

Properties: maxOccurs =1 minOccurs = 0

Guidance on completion of schema element: Conditional. Indicate whether specific water objectives have been set to protect relevant water dependent protected habitats and species by selecting the appropriate option from the enumeration list.

Quality checks: Element check: A valid option must be selected from the enumeration list. Only one option can be selected.

Conditional check: Report if 'protectedAreaType' is 'Habitats' or 'Birds'.

Schema element: protectedAreaHabitatsBirdsObjectivesMet

Field type / facets: : YesNoNoInformation_Union_Enum: Yes, No, No information

Properties: maxOccurs =1 minOccurs = 0

Guidance on completion of schema element: Conditional. Indicate whether the objectives set to

protect water dependent habitats and species in Habitats and Birds Protected Areas are met:

'Yes': the specific water objectives set to protect water dependent habitats and species are met.

'No': the specific water objectives set to protect water dependent habitats and species are not yet met.

'No information'

Quality checks: Conditional check: Report if protectedAreaType is 'Habitats' or 'Birds' AND protectedAreaHabitatsBirdsObjectivesSet is either of the two 'Yes…' options.

Schema element: protectedAreaDrinkingWaterObjectivesSet

Field type / facets: YesNo_Enum: Yes, No

Properties: maxOccurs =1 minOccurs = 0

Guidance on completion of schema element: Conditional. Indicate whether additional, specific standards have been set to protect drinking water by selecting the appropriate option from the enumeration list:

'Yes': specific standards have been set in the surface water body / Protected Area for all relevant parameters to protect the drinking water quality.

'No': no specific standards have been set in the surface water body / Protected Area to protect the drinking water quality.

In this context, 'standards' mean specific quality objectives for pollutants for the protection of drinking water. Select 'No' if it is considered that other measures taken are sufficient to protect drinking water.

Quality checks: Conditional check: Report if protectedAreaType is 'Article 7 Abstraction for drinking water'.

Schema element: protectedAreaDrinkingWaterObjectivesMet

Field type / facets: YesNoNoInformation_Union_Enum: Yes, No, No information

Properties: maxOccurs =1 minOccurs = 0

Guidance on completion of schema element: Conditional. Indicate whether the specific standards set to protect drinking water quality in Article 7 Abstraction for Drinking Water Protected Areas are met:

'Yes': the specific standards set in the surface water body / Protected Area to protect the drinking water quality are met.

'No': the specific standards set in the surface water body / Protected Area to protect the drinking water quality are not met.

'No information'

Quality checks: Conditional check: Report if protectedAreaType is 'Article 7 Abstraction for Drinking Water' AND protectedAreaDrinkingWaterObjectivesSet is 'Yes…'.

Schema element: protectedAreaShellfishObjectivesSet

Field type / facets: ProtectedAreaShellfishObjective_Enum:

Yes, microbiological standards have been set to protect shellfish and these are identical to those in

the repealed Shellfish Directive 2006/113/EC. Yes, microbiological standards have been set to protect shellfish and these are different to those in the repealed Shellfish Directive 2006/113/EC. No, no microbiological standards have been set to protect shellfish. **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. Indicate whether microbiological standards have been set to protect shellfish by selecting the appropriate option from the enumeration list. **Quality checks**: Conditional check: Report if protectedAreaType is 'Shellfish'.
Schema element: protectedAreaShellfishObjectivesMet **Field type / facets:** YesNoNoInformation_Union_Enum: Yes, No, No information **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. Indicate whether the microbiological standards set to protect shellfish in Shellfish Protected Areas are met: 'Yes': the microbiological standards set to protect shellfish are met. 'No': the microbiological standards set to protect shellfish are not met. 'No information' **Quality checks**: Conditional check: Report if protectedAreaType is 'Shellfish' AND protectedAreaShellfishObjectivesSet is either of the two 'Yes…' options.
Schema element: protectedAreaComment **Field type / facets:** String1000Type **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Optional. If objectives have not been set or standards have not been met for the Protected Area, provide further explanation (which objectives have not been set, which standards have not been met, reasons, etc).
Schema element: protectedAreaExemption **Field type / facets:** ExemptionType_Enum (see Annex 8g) **Properties**: maxOccurs =unbounded minOccurs = 1 **Guidance on completion of schema element**: Required. Report which type(s) of exemption(s) from the relevant Protected Area objectives or standards apply at surface water body level, or 'No exemption'. More than one exemption may apply. Provide further details in the RBMP and/or background documents. For more information see Section 5.4.4 below. **Quality checks**: Conditional check: report for each euProtectedAreaCode reported if swAssociatedProtectedArea is 'Yes'. Within-schema check: the option 'No exemption' is not compatible with any other.

Information regarding Protected Areas associated with groundwater bodies should be reported at groundwater body level according to the schema GWB (see section 5.3.4 Glossary for further explanation).

Schema: GWB (continued)
Class GWAssociatedProtectedArea *Properties: maxOccurs = unbounded minOccurs = 0* *Conditional check: report at least 1 if 'gwAssociatedProtectedArea' is 'Yes'*
Schema element: euProtectedAreaCode Field type / facets: FeatureUniqueEUCodeType Properties: maxOccurs =1 minOccurs = 1 Guidance on completion of schema element: Required[66]. Unique EU code(s) of the (water-dependent) Protected Area(s) associated to the groundwater body. If applicable, report the code of the Protected Area as previously reported under other directives. If it has not been reported under other Directives, report the code reported under the GML schema ProtectedAreas (see Annex 5 GIS guidance). If not already included in the first two characters of the code when reported under other directives, prefix the unique code with the Member State's 2-alpha character ISO country code. Quality checks: Element check: First 2 characters must be the Member State's 2-alpha character ISO country code. Cross-schema check: the reported euProtectedAreaCode must be consistent with the codes reported in ProtectedArea/thematicIdIdentifier
Schema element: protectedAreaType Field type / facets: ProtectedGWAreaType_Enum: Birds Habitats Nitrates Article 7 Abstraction for Drinking Water Other Properties: maxOccurs =1 minOccurs = 1 Guidance on completion of schema element: Conditional. Report the type for each Protected Area related to the groundwater body. Fewer types of Protected Area are relevant to groundwater bodies. 'Birds' and 'Habitats' are relevant if protected habitats and species rely on groundwater dependent surface waters or terrestrial ecosystems.

[66] Please note that the multiplicity of the Class GWAssociatedProtectedArea is 0 to many. Therefore, if there are no associated protected areas to report for the relevant water body, this whole class does not need to be reported

Quality checks: Conditional check: report for each euProtectedAreaCode reported.
Schema element: protectAreaOtherType **Field type / facets:** String250Type **Properties:** maxOccurs =unbounded minOccurs = 0 **Guidance on completion of schema element**: Conditional. If the type of Protected Area is reported as 'Other', provide more information. **Quality checks**: Conditional check: Report if 'protectedAreaType' is 'Other'.
Schema element: protectedAreaAssociationType **Field type / facets:** ProtAreaAssociationType_Enum: Within Protected Area Overlapping / partly within Protected Area Dynamically / hydrologically connected with Protected Area **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Report the type of association that the groundwater body has with the Protected Area. The boundaries of groundwater bodies and Protected Areas will not always directly coincide with each other. 'Within Protected Area' = The groundwater body is located entirely within the Protected Area. The Protected Area may be associated with more than one groundwater body. 'Overlapping / partly within Protected Area' = The groundwater body overlaps or is located partly within the Protected Area, or overlaps more than one Protected Area. 'Dynamically / hydrologically connected with Protected Area' = The groundwater body is dynamically or hydrologically connected with the Protected Area without being located entirely or partly within it. **Quality checks**: Conditional check: report for each euProtectedAreaCode reported
Schema element: protectedAreaHabitatsBirdsObjectivesSet **Field type / facets:** ProtectedAreaHabitatsBirdsObjective_Enum: Yes, specific water objectives have been set to protect all water dependent habitats and species. Yes, some specific water objectives have been set to protect water dependent habitats and species but work is still on-going to determine needs. No, no specific water objectives have been set to protect water dependent habitats and species because the achievement of WFD good status is sufficient to achieve favourable conservation status. No, no specific water objectives have been set to protect water dependent habitats and species because additional needs are not known. **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. Indicate whether specific water objectives have been set to protect relevant groundwater dependent protected habitats and species by

selecting the appropriate option from the enumeration list.

Quality checks: Conditional check: Report if 'protectedAreaType' is 'Habitats' or 'Birds'.

Schema element: protectedAreaHabitatsBirdsObjectivesMet

Field type / facets: YesNoNoInformation_Union_Enum: Yes, No, No information

Properties: maxOccurs =1 minOccurs = 0

Guidance on completion of schema element: Conditional. Indicate whether the objectives set to protect groundwater dependent habitats and species in Habitats and Birds Protected Areas are met:

'Yes': the specific groundwater objectives set to protect groundwater dependent habitats and species are met.

'No': the specific groundwater objectives set to protect groundwater dependent habitats and species are not yet met.

'No information'

Quality checks: Conditional check: Report if protectedAreaType is 'Habitats' or 'Birds' AND protectedAreaHabitatsBirdsObjectivesSet is either of the two 'Yes' options.

Schema element: protectedAreaDrinkingWaterObjectivesSet

Field type / facets: YesNo_Enum: Yes, No

Properties: maxOccurs =1 minOccurs = 0

Guidance on completion of schema element: Conditional. Indicate whether additional, specific standards have been set to protect drinking water:

'Yes': specific standards have been set in the groundwater body / Protected Area for all relevant parameters to protect the drinking water quality.

'No': no specific standards have been set in the groundwater body / Protected Area to protect the drinking water quality.

In this context, 'standards' mean specific quality objectives for pollutants for the protection of drinking water. Select 'No…' if it is considered that other measures taken are sufficient to protect drinking water.

Quality checks: Conditional check: Report if protectedAreaType is 'Article 7 Abstraction for Drinking Water'.

Schema element: protectedAreaDrinkingWaterObjectivesMet

Field type / facets: YesNoNoInformation_Union_Enum: Yes, No, No information

Properties: maxOccurs =1 minOccurs = 0

Guidance on completion of schema element: Conditional. Indicate whether the specific standards set to protect drinking water quality in Article 7 Abstraction for Drinking Water Protected Areas are met:

'Yes': the specific standards set in the groundwater body / Protected Area to protect the drinking water quality are met.

'No': the specific standards set in the groundwater body / Protected Area to protect the drinking water quality are not met.

'No information' **Quality checks**: Conditional check: Report if protectedAreaType is 'Article 7 Abstraction for Drinking Water' AND protectedAreaDrinkingWaterObjectivesSet is 'Yes'.
Schema element: protectedAreaComment **Field type / facets:** String1000Type **Properties**: maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Optional. If objectives have not been set or standards have not been met for the Protected Area, provide further explanation (which objectives have not been set, which standards have not been met, reasons, etc).
Schema element: protectedAreaExemption **Field type / facets:** ExemptionType_Enum (see Annex 8g) **Properties:** maxOccurs =unbounded minOccurs = 1 **Guidance on completion of schema element**: Conditional. Report which type(s) of exemption(s) from the relevant Protected Area objectives or standards apply at groundwater body level (if any). More than one exemption may apply. Provide further details in the RBMP and/or background documents. For more information see Section 5.4.4 below. **Quality checks**: Conditional check: report for each euProtectedAreaCode reported if gwAssociatedProtectedArea is 'Yes'. Within-schema check: the option 'No exemption' is not compatible with any other.

5.3.3. GIS Information

GIS information in GML file format should be reported for Protected Areas according to the specifications of the guidance for reporting spatial data (see Annex 5 GIS Guidance). If the Protected Areas are already reported under other directives (e.g. Natura 2000 Protected Areas under the Habitats Directive, bathing waters under the Bathing Water Directive, sensitive areas under UWWTD or vulnerable zones under the Nitrates Directive) they do not need to be reported again under the WFD.

5.3.4. Glossary: clarification of terms and reporting requirements

WFD Article 7 Drinking Water Protected Areas:

According to Article 7.2 of the WFD, Member States should ensure that, under the water treatment regime applied, the resulting water will meet the requirements of the Drinking Water Directive. For this purpose, Member States are expected to set additional standards in the water bodies used for the abstraction of drinking water. Reporting requests information on whether this is the case and whether these standards are met.

Bathing Water Directive:

In general, Member States would not be expected to provide information on the status of bathing waters under the WFD as there is an annual reporting exercise that provides this information and this has been successfully integrated into WISE.

Birds and Habitats Directives:

'Favourable conservation status' of protected habitats and species is not assessed at site level but at national level per biogeographic region, taking into account the overall situation. Water dependent habitats and species may require more stringent protection than that afforded by the WFD objective of good status, i.e. more stringent standards for some physico-chemical parameters, high status for specific hydromorphological parameters or specific quantities of water. In the context of the WFD reporting, therefore, Member States would be expected to report whether the specific and additional needs of water dependent habitats and species have been evaluated and set as objectives under the WFD Article 4(1)c. The status of the Protected Area is then assessed against these specific additional water objectives and the result of such assessment reported. Note that there may be cases where the WFD relevant objectives are met but still the habitats and species are not in favourable conservation status, due to other non-water dependent requirements. In addition, the schema element CommentValueStatusProtArea can be used to provide additional information about the habitats or species that are relevant in the Protected Areas overlapping with each particular water body.

Shellfish Directive:

Microbiological standards are essential for the quality of shellfish water. It is requested to report if these standards have been set (or maintained from the shellfish water directive) and if they are met.

Fish Directive:

It is considered that the WFD objective of good ecological status integrates fully the objectives of the Fish Directive, so no further information is requested as regards specific objectives and status for this type of Protected Area.

Nitrates Directive:

It is considered that the WFD objective of good ecological status integrates fully the objectives of the Nitrates Directive of protecting from eutrophication, so no further information is requested as regards specific objectives and status for this type of Protected Area. In addition, there is a regular reporting exercise under the Nitrates Directive.

Urban Waste Water Treatment Directive:

This type of Protected Area is reported in the Register of Protected Areas (schema PA) but status information is not relevant in this context. Eutrophication status is captured by WFD ecological status.

6. Reporting at MS level: Competent Authorities, RBDs and Sub-units (schema RBDSUCA)

6.1. Introduction

The WFD defines the River Basin District (RBD) as 'the area of land and sea, made up of one or more neighbouring river basins together with their associated groundwaters and coastal waters'. 'A 'river basin' means the area of land from which all surface run-off flows through a sequence of streams, rivers and, possibly, lakes into the sea at a single river mouth, estuary or delta.' One river basin, including all its tributaries, must not be divided between different RBDs. One RBD may, however, include several (sometimes smaller) river basins, and shall also include associated coastal waters and groundwaters (e.g. Bothnian Bay (SE) or Adour-Garonne (FR)).

The RBD is the main unit for management of river basins as specified in Article 3(1) for which Competent Authorities (in both national and international RBDs) need to be identified that will manage the administrative arrangements and apply the rules of the Directive (Article 3(2) and Article 3(3)) within the RBD. Through Article 3(4) and Article 3(5) there is a requirement to co-ordinate the actions (nationally and internationally) to achieve the Environmental Objectives established by the Directive (Article 4) through the planned PoMs.

This designation of RBDs is, therefore, one of the core aspects of the integrated river basin management approach setting out the geographical extent for the co-ordination of water resources. The principle of holistic water management at the catchment level, from source to sea and based on surface waters and associated groundwaters, rather than on administrative boundaries, is reflected in the requirement for RBD designation.

The WFD requires the designation of Competent Authorities (Article 3, Annex I) within each RBD including for the portion of any international RBD lying within their territory. Member States notified the European Commission of their Competent Authorities in 2004. In addition to name and geographical coverage, information was also provided on the legal and administrative responsibilities of each Competent Authority and of its role within each RBD. Where the Competent Authority acts as a co-ordinating body for other Competent Authorities, a list is required of these bodies together with a summary of the institutional relationships established to ensure co-ordination. The RBMPs should also include a list of Competent Authorities in accordance with Annex I (Annex VII.10).

6.1.1. How will the European Commission and the EEA use the information reported?

The European Commission will use the information reported by Member States to ensure that appropriate governance arrangements are in place to enable the proper implementation of the WFD. The information will also be used to identify the relevant Competent Authorities involved in the implementation of the WFD, should further information be required. Statistics and information will be provided to the European Parliament at EU level. Information will be provided to the public through WISE.

6.2. Products from reporting

Nb	Name of product	Type of product	Scale of information*	Detailed information displayed	Source of detailed information and aggregation rule	Used in 2012 reports?*
1	**Basic information on RBDs and Sub-units**	Table	EU/MS/RBD/SU	Number and size (area) of national and international RBDs and Sub-units.	Aggregated information on the basis of information provided at RBD/Sub-unit level.	No

6.3. Contents of the 2016 reporting

6.3.1. Schema sketch

See Annex 10.1.

6.3.2. Information and data to be reported using the schemas

Information regarding the Competent Authorities and RBDs within a Member State should be reported at Member State level.

Information should be reported for each Competent Authority in the Member State.

Schema: RBDSUCA
Class CompetentAuthority *Properties: maxOccurs = unbounded minOccurs = 1*
Schema element: euCACode **Field type / facets:** FeatureUniqueEUCodeType **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Unique EU code of the Competent Authority. Prefix the Competent Authority's national, unique code with the Member State's 2-alpha character ISO country code. Where a number of small Competent Authorities (e.g. 'municipalities') each have a key involvement they can be reported as a single, generic group rather than each Competent Authority being reported as a separate entity. **Quality checks**: Element check: First 2 characters must be the Member State's 2-alpha character ISO country code.[67] Within-schema check: euCACode must be unique.
Schema element: competentAuthorityName **Field type / facets:** String250Type **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Official name of the Competent Authority in

[67] Member State's 2-alpha character ISO country code: http://publications.europa.eu/code/en/en-370100.htm (Note: for Greece use 'EL' and United Kingdom use 'UK')

English. Where a number of small Competent Authorities (e.g. 'municipalities') each have a key involvement they can be reported as a single, generic group rather than each Competent Authority being reported as a separate entity. In that case please indicate in the name the number of individual authorities represented by the generic entry, e.g. Municipalities in the RBD – 365 authorities.
Schema element: competentAuthorityNameNL **Field type / facets:** String250Type **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Official name of the Competent Authority in the Member State's national language. Where a number of small Competent Authorities (e.g. 'municipalities') each have a key involvement they can be reported as a single, generic group rather than each Competent Authority being reported as a separate entity.
Schema element: competentAuthorityNameNLLanguage **Field type / facets:** LanguageCode_Enum (see Annex 8j) **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Language used for reporting the name of the Competent Authority in the Member State's national language.
Schema element: linkToCompetentAuthority **Field type / facets:** String1000Type **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Website address of the Competent Authority. If a generic group of Competent Authorities are reported (see guidance under competentAuthorityName and competentAuthorityNameNL), report the prime Competent Authority's website address, if any. If not, report 'Not available'.
Schema element: acronym **Field type / facets:** String100Type **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Optional. Acronym of the Competent Authority (if applicable).
Schema element: street **Field type / facets:** String100Type **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Optional. Street address of the Competent Authority in English.
Schema element: city

Field type / facets: String100Type **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Optional. City address of the Competent Authority in English.
Schema element: cityNL **Field type / facets:** String100Type Properties: maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Optional. City address of the Competent Authority in the Member State's national language.
Schema element: country **Field type / facets:** String100Type **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Optional. Country address of the Competent Authority in English.
Schema element: postcode **Field type / facets:** String100Type **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Optional. Postcode address of the Competent Authority in English.
Schema element: mainRole **Field type / facets:** Roles_Enum: List of roles (see Annex 8k) **Properties:** maxOccurs =unbounded minOccurs = 1 **Guidance on completion of schema element**: Required. Identify the Competent Authority's main role(s) in the implementation of the WFD in the RBD. More than one role can be selected from the enumeration list. All of the main roles included in the enumeration list must be covered by at least one Competent Authority within the Member State. A single Competent Authority may or may not be responsible for all of the main roles. **Quality checks**: Within-schema check: Each main role must be covered by at least one Competent Authority within the Member State.
Schema element: otherRole **Field type / facets:** Roles_Enum:List of roles (see Annex 8k) **Properties:** maxOccurs =unbounded minOccurs = 0 **Guidance on completion of schema element**: Optional. If relevant, identify the role(s) where the Competent Authority contributes or supports another Competent Authority in a particular role.

Information should be reported for each RBD in the Member State.

Schema: RBDSUCA (continued)
Class RBD *Properties: maxOccurs = unbounded minOccurs = 1*
Schema element: euRBDCode Field type / facets: FeatureUniqueEUCodeType Properties: maxOccurs =1 minOccurs = 1 Guidance on completion of schema element: Required. Unique EU code of the River Basin District. Prefix the RBD's national, unique code with the Member State's 2-alpha character ISO country code. Quality checks: Element check: First 2 characters must be the Member State's 2-alpha character ISO country code. [68] Within-schema check: euRBDCode must be unique.
Schema element: rbdName Field type / facets: String250Type Properties: maxOccurs =1 minOccurs = 1 Guidance on completion of schema element: Required. Readily understandable name of the RBD in English that is meaningful outside of the RBD or Member State.
Schema element: rbdArea Field type / facets: NumberDecimalType Properties: maxOccurs =1 minOccurs = 1 Guidance on completion of schema element: Required. Area of the RBD in km^2 <u>including</u> coastal waters but <u>excluding</u> territorial waters as required for the chemical status under WFD Article 2(1).
Schema element: rbdAreaExclCW Field type / facets: NumberDecimalType Properties: maxOccurs =1 minOccurs = 1 Guidance on completion of schema element: Required. Area of the RBD in km^2 <u>excluding</u> coastal waters and territorial waters.
Schema element: internationalRBD Field type / facets: YesNoCode_Enum: Yes, No Properties: maxOccurs =1 minOccurs = 1 Guidance on completion of schema element: Required. Indicate whether the RBD is part of an

[68] Member State's 2-alpha character ISO country code: http://publications.europa.eu/code/en/en-370100.htm (Note: for Greece use 'EL' and United Kingdom use 'UK')

international RBD.
Schema element: internationalRBDName **Field type / facets:** String250Type **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. Report the name of the international RBD in English of which this RBD is a part. **Quality checks**: Conditional check: Report if internationalRBD is 'Yes'.
Schema element: primeCompetentAuthority **Field type / facets:** FeatureUniqueEUCodeType **Properties:** maxOccurs =unbounded minOccurs = 1 **Guidance on completion of schema element**: Required. Report the euCACode of the RBD's Prime Competent Authority. An RBD will usually have only one Prime Competent Authority. The introduction of more than one Prime Competent Authority is reserved for those cases in which there is more than one Competent Authority with equivalent level of competences (e.g. over different geographical areas within the RBD) with no established hierarchy and/or where none has a defined role as co-ordinator. **Quality checks**: Within-schema check: The reported euCACode(s) must be consistent with the codes reported in RBDSUCA/CompetentAuthority/euCACode.
Schema element: otherCompetentAuthority **Field type / facets / relationship**: FeatureUniqueEUCodeType **Properties:** maxOccurs =unbounded minOccurs = 0 **Guidance on completion of schema element**: Conditional. If relevant, report the euCACode(s) of other Competent Authority(ies) in the RBD. **Quality checks**: Within-schema check: The reported euCACode(s) must be consistent with the codes reported in *RBDSUCA*/*CompetentAuthority*/euCACode.
Schema element: subUnitsDefined **Field type / facets / relationship**: YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether the RBD has been divided into Sub-units.

The following class (child of RBD) is used to report the sub-units within the RBD:

Schema: RBDSUCA
Class: SubUnit ***Properties:*** *maxOccurs = unbounded minOccurs = 0*

Conditional check: report at least 1 sub-unit if 'subUnitsDefined' is 'Yes'.
Schema element: euSubUnitCode **Field type / facets:** FeatureUniqueEUCodeType **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required[69]. If the RBD has been divided into Sub-units, report the unique EU code of each Sub-unit. Prefix the Sub-unit's national, unique code with the Member State's 2-alpha character ISO country code.[70]
Schema element: subUnitName **Field type / facets:** String250Type **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Readily understandable name of the Sub-unit in English that is meaningful outside of the RBD or Member State.
Schema element: subUnitArea **Field type / facets:** NumberDecimalType **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Area of the Sub-unit in km^2 including coastal waters.
Schema element: subUnitAreaExclCW **Field type / facets:** NumberDecimalType **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Area of the Sub-unit in km^2 excluding coastal waters and territorial waters.

6.3.3. GIS information

GIS information in GML file format should be reported for RBDs and Sub-units according to the specifications of the guidance for reporting spatial data (see Annex 5 GIS Guidance).

6.3.4. Guidance on the contents of the RBMPs/background documents

The following provides guidance on the aspects that the European Commission expects to find in the relevant chapters on Competent Authorities, RBDs and Sub-units in the RBMPs or in background documents. This guidance is not intended to be comprehensive in terms of what the

[69] Please note that the multiplicity of the Class SubUnit is 0 to many. Therefore, if there are no sub-units in the RBD this whole class does not need to be reported

[70] Member State's 2-alpha character ISO country code: http://publications.europa.eu/code/en/en-370100.htm (Note: for Greece use 'EL' and United Kingdom use 'UK')

Member States have to include in their RBMPs or background documents, rather to provide certain concrete elements of information that the European Commission expects to find.

Change in Competent Authorities

An explanation should be provided if the Competent Authorities, or their roles, have changed since the publication of the first RBMPs. This should include information on the reasons for the changes and how the changes will support the improved implementation of the WFD.

Co-ordination

A detailed summary of how co-ordination is achieved between Competent Authorities within the same RBD and Member State should be provided. This should include:

- How co-ordination is achieved between Competent Authorities with different roles.
- How co-ordination is achieved between Competent Authorities who share a role (e.g. for issuing permits, enforcement etc).

7. REPORTING AT RBD/SUB-UNIT LEVEL FOR SURFACE WATER (SCHEMA SWMET)

7.1. Overview of reporting of methodologies for surface water bodies

Reporting of methodologies for surface water bodies is done for each RBD. For the purpose of presentation in this guidance, the contents of reporting are structured according to the following sub-chapters:

- Methodologies characterisation
- Methodologies classification of ecological status
- Methodologies classification of chemical status
- Overall management objectives (nutrients, river continuity)
- Definition of significant pressures and impacts
- Methodologies for exemptions

The following sections describe the contents of reporting. The UML diagram of the SWMET schema is found in Annex 10.5.

7.2. Methodologies characterisation

7.2.1. Introduction

Article 5 of the WFD requires Member States to identify surface water bodies that will be used for assessing progress with, and achievement of, the WFD's Environmental Objectives. In addition, under certain conditions, Article 4(3) of the WFD permits Member States to identify and designate artificial water bodies (AWB) and heavily modified water bodies (HMWB). AWB and HMWB are required to achieve Good Ecological Potential (GEP) by 2015.

Identifying the size of surface water bodies was an important parameter that had implications on the design of the monitoring programmes and on the development of appropriate programmes of measures. A stepwise process for the identification of AWB and HMWB resulted in a provisional

identification by 2004. Full identification should have been completed by 2010 for publication in the first RBMPs. The characterisation of surface water body types, including the identification of AWB and HMWB, may have been reviewed and revised as part of the review and update (if necessary) of the Article 5 analysis, required by December 2013.

Article 5 also requires Member States to analyse the characteristics of surface water bodies and to provide a summary report on surface water characterisation, including general information on their typology.

7.2.2. How will the European Commission and the EEA use the information reported?

The European Commission will use the information provided to check that small water bodies received sufficient consideration when not delineated as such, and to check compliance in the designation of AWB and HMWB. Statistics and information will be provided to the European Parliament at EU level. Information will be provided to the public through WISE.

7.2.2.1. Products from Reporting

The European Commission will produce tables showing:

- an overview of how small water bodies have been covered by the different Member States and water categories

7.2.3. Contents of the 2016 reporting

7.2.3.1. Schema sketch

See Annex 10.5.

7.2.3.2. Information and Data to be reported using the schemas

For each type of surface water body, report the following information:

Schema: SWMET
Class SWType *Properties: maxOccurs = unbounded minOccurs = 1*
Schema element: swTypeCode Field type / facets: String100Type Properties: maxOccurs =1 minOccurs = 1 Guidance on completion of schema element: Required. Member State code for the characterisation type of the water body, as reported for each water body in the surface water schema (SWB), and the RBMP and background documents. If typology for HMWBs and/or AWBs has been derived and used it should be reported here. This will allow reporting of e.g. physico-chemical standards linked to these types under the schema SWMET. Details on the typologies are no longer requested but a brief description of the type is required in TypeName and reference to where further details can be found in the RBMP and background documents. In the previous reporting exercise in 2010, some Member States reported more characterisation

types than were subsequently reported with surface water bodies. Please ensure consistency in the data reported. **Quality assurance checks:** Cross-schema check: The reported swTypeCode must be consistent with the codes reported in SWB/SurfaceWaterBody/surfaceWaterBodyTypeCode.
Schema element: swTypeDescription **Field type / facets:** String1000Type **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Briefly describe the type (e.g. small, lowland, siliceous rivers). Provide a reference to where further details can be found in the RBMP and background documents.
Schema element: swIntercalibrationType **Field type / facets:** SWIntercalibrationType_Enum (see Annex 8a) **Properties:** maxOccurs =unbounded minOccurs = 1 **Guidance on completion of schema element**: Required. If the surface water body type corresponds with an intercalibration type, report the intercalibration type code (not name). The intercalibration type reported in this element must be appropriate to the surface water body's Category. If there is no corresponding intercalibration type, select 'Not applicable'. **Quality checks**: Cross-schema check: The reported intercalibrationType must be consistent with the codes reported in SWB/SurfaceWaterBody/surfaceWaterBodyIntercalibrationType
Schema element: swTypeCategory **Field type / facets:** SWCategory_Enum: RW, LW, TW, CW **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Report the category of surface water body to which this type refers. 'RW' = River water body. 'LW' = Lake water body. 'TW' = Transitional water body. 'CW' = Coastal water body.
Schema element: swTypeSpecificReferenceConditionsForBQEs **Field type / facets:** AllSomeNone_Enum: All, Some, None **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether type-specific reference conditions have been established for this surface water type for all relevant BQEs: 'All': Yes, reference conditions have been set for this type for all relevant BQEs 'Some': Partly, reference conditions have been set for this type for some BQEs

'None': No, reference conditions have not been set for this type for any BQEs
Schema element: swTypeSpecificReferenceConditionsForHyMoQEs **Field type / facets:** AllSomeNone_Enum: All, Some, None **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether type-specific reference conditions have been established for this surface water type for all relevant hydromorphological QEs. 'All': Yes, reference conditions have been set for this type for all relevant hydromorphological QEs 'Some': Partly, reference conditions have been set for this type for some hydromorphological QEs 'None': No, reference conditions have not been set for this type for any hydromorphological QEs
Schema element: swTypeSpecificReferenceConditionsForPhysChemQEs **Field type / facets:** AllSomeNone_Enum: All, Some, None **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether type-specific reference conditions have been established for this surface water type for all relevant physico-chemical QEs: 'All': Yes, reference conditions have been set for this type for all relevant physico-chemical QEs 'Some': Partly, reference conditions have been set for this type for some physico-chemical QEs 'None': No, reference conditions have not been set for this type for any physico-chemical QEs

The following class is used to report information on methodologies:

Schema: SWMET (continued)
Class SWMethodologies *Properties: maxOccurs = 1 minOccurs = 1*
Schema element: typologyMethodologyReference **Field type / facets:** ReferenceType (see Annex 9) **Properties:** maxOccurs =unbounded minOccurs = 1 **Guidance on completion of schema element**: Required. Provide references or hyperlinks to the documents and sections where relevant information relating to the typology methodology can be found. Guidance on what should be included in this document is provided in Section 7.2.3.3.
Schema element: smallWBsMethodologyReference **Field type / facets:** ReferenceType (see Annex 9) **Properties:** maxOccurs =unbounded minOccurs = 1 **Guidance on completion of schema element**: Required. Provide references or hyperlinks to the documents and sections where relevant information relating to the methodology for small water bodies can be found. Guidance on what should be included in this document is provided in Section

7.2.3.3.
Schema element: minimumCatchmentAreaRivers **Field type / facets:** NumberDecimalType **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. If defined, state the minimum catchment area in km² for a river to be delineated as a water body in the RBMP. If not defined report -8888. **Quality checks**: Element check: Report -8888 if a minimum catchment area of rivers has not been defined.
Schema element: minimumSurfaceAreaLakes **Field type / facets:** NumberDecimalType **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. If defined, state the minimum surface area in km² for a lake to be delineated as a water body in the RBMP. If not defined report -8888. **Quality checks**: Element check: Report -8888 if a minimum surface area of lakes has not been defined.
Schema element: otherMinimumCriteria **Field type / facets:** String1000Type **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Optional. If the minimum criteria used for the delineation of river water bodies is not based on catchment area, or for lake water bodies is not based on surface area, describe the criteria used.
Schema element: iRBDTypologyCoOrdinationReference **Field type / facets:** ReferenceType (see Annex 9) **Properties:** maxOccurs =unbounded minOccurs = 0 **Guidance on completion of schema element**: Conditional. Provide references or hyperlinks to the documents and sections where relevant information relating to the co-ordination of typology methodology in international RBDs can be found. Guidance on what should be included in this document is provided in Section 7.2.3.3. **Quality checks**: Cross-schema check: Report if RBDSUCA/RBD/internationalRBD is 'Yes'.
Schema element: hmwbMethodologyReference **Field type / facets:** ReferenceType (see Annex 9) **Properties:** maxOccurs =unbounded minOccurs = 1 **Guidance on completion of schema element**: Required. Provide references or hyperlinks to the documents and sections where any relevant information relating to the methodology for the designation of AWB and HMWB, can be found. Guidance on what should be included in this document is provided in Section 7.2.3.3.

7.2.3.3. Guidance on contents of RBMPs/Background Documents

The following provides guidance on the aspects that the European Commission expects to find in the relevant chapters on methodologies in the RBMPs or in background documents. This guidance is not intended to be comprehensive in terms of what the Member States have to include in their RBMPs or background documents, rather to provide certain concrete elements of information that the European Commission expects to find.

Typology

- The background documents accompanying the RBMPs should include a detailed description of the typology methodology, with information on whether system A or B has been used, typology factors (descriptors) and related ranges, methods for testing typology versus biological data, and setting the type-specific reference conditions.

- Member States with a coastline where no transitional waters have been delineated should include a clear justification for this in these documents.

- For international RBDs, it should be indicated whether typology was co-ordinated with the Member States and third countries sharing the international RBD and, if so, how this co-ordination was achieved and the results. If the typology was not co-ordinated, provide reasons why, steps that have been taken to address this shortcoming and by when co-ordination will be achieved.

Small water bodies

- Describe the approach that has been taken to deal with small water bodies including information on the size threshold used for the delineation of water bodies for rivers, lakes and transitional waters.

Reference conditions

- Describe the reference conditions for all types and quality elements (biological, physico-chemical and hydromorphological). If there are gaps, identify them explicitly. Identify any quality elements which are not considered reliable for some types (under WFD Annex II section 1.3.vi) and explain the basis of information.

Designation of HMWBs

- Describe in detail the methodology for the designation of HMWBs, including:
    - Criteria used for the identification of substantial change in character. Thresholds should be included if they have been used (such as percentage, length or area of the water body affected by modification, the size of dams or impoundment).
    - Type of physical alterations considered for the designation of HMWB.
    - Criteria used for the assessment of significant adverse effect on the use. Indicate if thresholds have been used for the different water uses to define significant adverse

effect (such as percentage of losses in energy production, agricultural production, and increase in risk of flooding).

- List the water uses behind the designated HMWB and the number or percentage of water bodies for each use.
- Explain how WFD Article 4(3)b has been applied (better environmental option). Which 'other means' have been considered for each water use. Describe all cases in which this assessment has concluded that there is a need to restore a water body and achieve the beneficial objectives through other means which are significantly better environmental options.

For further information, refer to the following CIS Guidance Documents:

- CIS Guidance Document No. 2: Identification of Water Bodies[71]
- CIS Guidance Document No. 4: Identification and Designation of Heavily Modified and Artificial Water Bodies[72]
- CIS Guidance Document No. 5: Transitional and Coastal Waters – Typology, Reference Conditions and Classification Systems[73]
- CIS Guidance Document No. 10: Rivers and Lakes - Typology, Reference Conditions and Classification Systems[74].

In addition, refer to the Intercalibration Official Decision[75] and Technical Reports[76].

7.2.3.4. Glossary: clarification of terms and reporting requirements

Wider environment:

WFD Article 4(3)(a)(i) refers to the 'wider environment'. 'Consequently a restricted definition of environment would not be appropriate and the environment is considered to include the natural

[71] https://circabc.europa.eu/sd/a/655e3e31-3b5d-4053-be19-15bd22b15ba9/Guidance%20No%202%20-%20Identification%20of%20water%20bodies.pdf

[72] https://circabc.europa.eu/sd/a/f9b057f4-4a91-46a3-b69a-e23b4cada8ef/Guidance%20No%204%20-%20heavily%20modified%20water%20bodies%20-%20HMWB%20(WG%202.2).pdf

[73] https://circabc.europa.eu/sd/a/85912f96-4dca-432e-84d6-a4dded785da5/Guidance%20No%205%20-%20characterisation%20of%20coastal%20waters%20-%20COAST%20(WG%202.4).pdf

[74] https://circabc.europa.eu/sd/a/dce34c8d-6e3d-469a-a6f3-b733b829b691/Guidance%20No%2010%20-%20references%20conditions%20inland%20waters%20-%20REFCOND%20(WG%202.3).pdf

[75] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:332:0020:0044:EN:PDF

[76] https://circabc.europa.eu/sd/a/61fbcb5b-eb52-44fd-810a-63735d5e4775/IC_GUIDANCE_FINAL_16Dec2010.pdf

environment and the human environment including archaeology, heritage, landscape and geomorphology'[77].

7.3. Methodologies classification ecological status and potential

7.3.1. Introduction

Annex V of the WFD specifies how Member States are to monitor and present 'status' classification. The European Commission needs to ensure that 'good status/potential' has been defined according to the provisions of the Directive, and in a consistent and comparable way throughout the EU. The status requirements refer to all QEs in the Directive, chemical and biological. The normative provisions of Annex V provide a starting point. However, interpretation and application of these definitions may differ which may lead to a wide range of variation between the Member States. In this respect, it is important to compare the criteria and thresholds that Member States have set. Whilst it is recognised that the intercalibration exercise has set out to ensure that the definition of high and good ecological status is consistent, the intercalibration exercise will not result in the findings of whether the Member States have followed the results of intercalibration or whether class boundaries have been established for all required water body types and quality elements. However, the intercalibration exercise has provided a useful template for the collection of such information which has been used in the development of this WFD Reporting Guidance.

7.3.2. How will the European Commission and the EEA use the information reported?

Information reported by Member States will be used to check whether Member States have established a status classification scheme in accordance with the WFD, and to determine whether status classes are consistent with the Directive, comprehensive, and comparable between Member States and RBDs. The comparison of assessment criteria and thresholds will make the level and ambition of environmental protection more transparent and will allow the identification of differences in assessment methods, in terms of whether they are comprehensive and comparable.

Statistics and information will be provided to the European Parliament at EU level. Information will be provided to the public through WISE.

7.3.2.1. Products from reporting

The following products will be produced:

- Table of assessment methods status – are methods available for each water category and type? For each BQE.
- Table of pressures to which the method is sensitive.
- Table of nutrient standards – are standards available for each water category and type? For each nutrient (level 3 + parameter name, e.g. Total Phosphorus)?

[77] CIS Guidance Document No. 4: Identification and Designation of Heavily Modified and Artificial Water Bodies https://circabc.europa.eu/sd/a/f9b057f4-4a91-46a3-b69a-e23b4cada8ef/Guidance%20No%204%20-%20heavily%20modified%20water%20bodies%20-%20HMWB%20(WG%202.2).pdf

Statistics can also be derived of the main methodological approaches used by Member States.

7.3.3. Contents of 2016 reporting

7.3.3.1. Schema sketch

See Annex 10.5.

7.3.3.2. Information and data to be reported using the schemas

The following class is used to report information on assessment methods for BQEs.

Schema: SWMET (continued)
Class BQEMethod *Properties: maxOccurs = unbounded minOccurs = 1*
Schema element: bqeMethodName Field type / facets: String250Type Properties: maxOccurs =1 minOccurs = 1 Guidance on completion of schema element: Required. Provide the name(s) of the assessment method(s) used for this BQE and category. The name(s) must be the same name(s) used in the RBMPs or background documents.
Schema element: bqeCode Field type / facets: BQE_Enum (see Annex 8h) Properties: maxOccurs =1 minOccurs = 1 Guidance on completion of schema element: Required. Select the BQE for which the assessment method applies.
Schema element: bqeCategoryRW Field type / facets: YesNoCode_Enum: Yes, No Properties: maxOccurs = 1 minOccurs = 1 Guidance on completion of schema element: Required. Does the assessment method apply to rivers?
Schema element: bqeCategoryLW Field type / facets: YesNoCode_Enum: Yes, No Properties: maxOccurs = 1 minOccurs = 1 Guidance on completion of schema element: Required. Does the assessment method apply to lakes?
Schema element: bqeCategoryTW Field type / facets: YesNoCode_Enum: Yes, No Properties: maxOccurs = 1 minOccurs = 1 Guidance on completion of schema element: Required. Does the assessment method apply to transitional waters?

Schema element: bqeCategoryCW **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Does the assessment method apply to coastal waters?
Schema element: bqePercentageOfTypes **Field type / facets:** NumberDecimal0100Type **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Report the percentage of types for this BQE and category for which an assessment method is fully developed.
Schema element: bqeSensitivityImpactNutrients **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Is the assessment method mainly sensitive to nutrient pollution?
Schema element: bqeSensitivityImpactOrganic **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Is the assessment method mainly sensitive to organic pollution?
Schema element: bqeSensitivityImpactChemical **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Is the assessment method mainly sensitive to chemical pollution?
Schema element: bqeSensitivityImpactSaline **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Is the assessment method mainly sensitive to saline pollution?
Schema element: bqeSensitivityImpactAcidification **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Is the assessment method mainly sensitive to acidification?

Schema element: bqeSensitivityImpactTemperature **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Is the assessment method mainly sensitive to elevated temperatures?
Schema element: bqeSensitivityImpactHydrological **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Is the assessment method mainly sensitive to altered habitats due to hydrological changes?
Schema element: bqeSensitivityImpactMorphological **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Is the assessment method mainly sensitive to altered habitats due to morphological changes?
Schema element: bqeSensitivityImpactOther **Field type / facets:** String100Type **Properties:** maxOccurs = 1 minOccurs = 0 **Guidance on completion of schema element**: Optional. If relevant, report any other impact to which the assessment method is mainly sensitive that is not covered in the previous questions.

The following class is used to report information on assessment methods for supporting QEs.

Schema: SWMET (continued)
Class SWSupportingQE ***Properties:*** *maxOccurs = unbounded minOccurs = 1*
Schema element: supportingQECode **Field type / facets:** SupportingQE_Enum (see Annex 8h): **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Select each supporting hydromorphological and physico-chemical QE in turn from the enumeration list and report the information in each of the following schema elements for each supporting QE.
Schema element: supportingQECategoryRW **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Is this supporting QE assessed in terms of

ecological status/potential in rivers?
Schema element: supportingQECategoryLW **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Is this supporting QE assessed in terms of ecological status/potential in lakes?
Schema element: supportingQECategoryTW **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Is this supporting QE assessed in terms of ecological status/potential in transitional waters?
Schema element: supportingQECategoryCW **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Is this supporting QE assessed in terms of ecological status/potential in coastal waters?
Schema element: supportingQESensitivityBQE **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether the classification boundaries for this supporting QE are related to the class boundaries for the sensitive BQEs.

The following class is used to report information on standards for general physico-chemical QEs including nutrients.

Schema: SWMET (continued)
Class SWPhysicoChemicalQE *Properties: maxOccurs = unbounded minOccurs = 1*
Schema element: physChemQECode **Field type / facets:** PhysChemQE_Enum (see Annex 8h): **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Select each physico-chemical QE at the level 4 of aggregation in turn from the enumeration list and report the information in each of the following schema elements for each QE. If the QE for which there is a standard is not included the enumeration list please select the most relevant 'Other' QE and describe in more detail in physChemQEOther.

Schema element: physChemQEOther **Field type / facets:** String100Type **Properties:** maxOccurs = 1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. Report details of the physico-chemical QE for which there is a standard if it is not included the enumeration list in physChemQECode. **Quality checks**: Conditional check: Report if physChemQECode is 'QE3-1-1-2 Other determinand for transparency', 'QE3-1-2-2 Other determinand for thermal conditions', 'QE3-1-3-3 Other determinand for oxygenation conditions', 'QE3-1-4-2 Other determinand for salinity', 'QE3-1-5-2 Other determinand for acidification status' or 'QE3-1-6-9 Other determinand for nutrient conditions'.
Schema element: physChemCategoryRW **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Does this physico-chemical standard apply to rivers?
Schema element: physChemCategoryLW **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Does this physico-chemical standard apply to lakes?
Schema element: physChemCategoryTW **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Does this physico-chemical standard apply to transitional waters?
Schema element: physChemCategoryCW **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Does this physico-chemical standard apply to coastal waters?
Schema element: physChemTypeCode **Field type / facets:** String100Type **Properties:** maxOccurs = unbounded minOccurs = 1 **Guidance on completion of schema element**: Required. For each standard, report the Member State code for the characterisation type of the water body, as reported in the surface water characterisation schema (in schema element surfaceWaterBodyTypeCode), and the RBMP and background documents.

If the standard applies to all national types, please enter 'All' (in English). More than one type can be added for the same standard value. If the types used in the derivation of physico-chemical standards are different from those used in the assessment of BQEs, please enter the specific national physico-chemical types. If so, please ensure the specific methodology document relating to the derivation of standards (and in particular how it is ensured that all biological types are covered by the standards) is uploaded to WISE or made available on the web. **Quality checks**: Within-schema check: The reported physChemTypeCode must be consistent with the codes reported in SWMET/SWType/swTypeCode or the entry 'All'.
Schema element: physChemValue **Field type / facets:** String20Type **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Report the value or range of the physico-chemical standard representing the good-moderate boundary only.
Schema element: physChemUnit **Field type / facets:** UnitOfMeasure_Enum (see Annex 8f) **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Report the unit of the physico-chemical standard. If 'Other' is selected then provide more information on the unit in physChemUnitOther.
Schema element: physChemUnitOther **Field type / facets:** String10Type **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. Report if the unit of the physico-chemical standard is reported as 'Other' in physChemUnit. **Quality checks**: Conditional check: Report if physChemUnit is 'Other'.
Schema element: physChemStandardType **Field type / facets:** : PhysChemStandardType_Enum: AA-EQS, MAC-EQS, 95 Percentile, Other **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Select the type of physico-chemical standard applied. 'AA-EQS' = Annual Average EQS 'MAC-EQS' = Maximum Allowable Concentration EQS '95th percentile' = 95th percentile 'Other' = Other
Schema element: physChemStandardOther **Field type / facets:** String10Type

Properties: maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. Report if the type of physico-chemical standard applied is reported as 'Other' in physChemStandardType. **Quality checks**: Conditional check: Report if physChemStandardType is 'Other'.
Schema element: physChemGMBoundary **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether the physico-chemical standard is consistent to the good-moderate status boundary of the relevant sensitive BQEs.

The following class is used to report each good-moderate EQS for each River Basin Specific Pollutant (previously known as QE3-3 Non-Priority Specific Pollutants and QE3-4 Other National Pollutants in the 2010 reporting exercise).

Schema: SWMET (continued)
Class SWRBSP *Properties: maxOccurs = unbounded minOccurs = 1*
Schema element: rbspCode **Field type / facets:** RBSP_Enum (see Annex 8b) **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Select each River Basin Specific Pollutant (RBSP) with a good-moderate EQS from the enumeration list. If there is more than one standard per substance (e.g. because there are different standards for different categories or matrices), the same RBSP can be introduced more than once.
Schema element: rbspOther **Field type / facets:** string100Type **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. If 'rbspCode' is 'EEA_00-00-0 - Other chemical parameter' please indicate in this field the CAS number (if relevant) and the name of the RBSP. **Quality check**: Conditional check: report if 'rbspCode' is 'EEA_00-00-0 - Other chemical parameter'.
Schema element: rbspMatrix **Field type / facets:** Matrix_Enum: Water Biota Biota - fish

Biota - other Sediment Sediment - settled sediment Sediment - suspended sediment **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Select the matrix in which the standard for the RBSP is applied for the purpose of assessment of ecological status.
Schema element: rbspCategoryRW **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Does the standard apply to rivers?
Schema element: rbspCategoryLW **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Does the standard apply to lakes?
Schema element: rbspCategoryTW **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Does the standard apply to transitional waters?
Schema element: rbspCategoryCW **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Does the standard apply to coastal waters?
Schema element: rbspStandardType **Field type / facets:** EQStandardType_Enum AA-EQS MAC-EQS Both Other **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Select the type of standard applied for each RBSP and matrix. 'AA-EQS' = Annual Average EQS.

'MAC-EQS' = Maximum Allowable Concentration EQS. 'Both' = Both AA and MAC EQS 'Other' = Other type of standard
Schema element: rbspValue **Field type / facets:** String100Type **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. For every combination of RBSP, matrix, standard type and category, report the value or range of the RBSP standard representing the good-moderate boundary only.
Schema element: rbspUnit **Field type / facets:** UnitOfMeasure_Enum (see Annex 8f) **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Report the unit of the RBSP standard.
Schema element: rbspScale **Field type / facets:** GeographicalScale_Enum (see Annex 8l) **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Report the geographical scale at which the RBSP standard is applied.
Schema element: rbspTechGuidance **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether the RBSP standard has been derived in accordance with the 2011 Technical Guidance Document No 27[78].
Schema element: rbspAnalyticalMethod **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether the analytical method used meets the minimum performance criteria laid down in Article 4.1 of the QA/QC Directive (2009/90/EC)[79] for the strictest standard applied. See Section 7.4.1 on fulfilment of the QA/QC Directive.
Schema element: rbspAnalyticalMethodBAT

[78] https://circabc.europa.eu/sd/a/0cc3581b-5f65-4b6f-91c6-433a1e947838/TGD-EQS%20CIS-WFD%2027%20EC%202011.pdf

[79] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:201:0036:0038:EN:PDF

Field type / facets: YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. If the analytical method does not meet the minimum performance criteria laid down in Article 4.1 of the QA/QC Directive, indicate whether the analytical method complies with the requirements laid down in Article 4.2 of the QA/QC Directive (2009/90/EC)[80] for the strictest standard applied.

The following class is used to report targeted questions on the classification of ecological status and the definition of good ecological potential (GEP).

Schema: SWMET (continued)
Class SWTargetedQ *Properties: maxOccurs = 1 minOccurs = 1*
Schema element: oneOutAllOut **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether the 'one-out, all-out' principle been applied in deriving the overall classification of the ecological status of a water body.
Schema element: groupingExtrapolation **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether the grouping of water bodies has been used in extrapolating the assessment and classification of ecological status from monitored water bodies to those water bodies with no monitoring sites.
Schema element: gepDefined **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether good ecological potential (GEP) has been defined.
Schema element: gepLevel **Field type / facets:** GEPLevel_Enum: At water body level For groups of HMWBs/AWBs of the same use/physical modification Other approach

[80] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:201:0036:0038:EN:PDF

Properties: maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. Indicate at what level GEP has been defined. **Quality checks**: Conditional check: Report if gepDefined is 'Yes'.
Schema element: gepApproach **Field type / facets:** GEPApproach_Enum: CIS Guidance Approach Mitigation Measures (Prague) Approach Hybrid CIS/Prague Approach. **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. Report the approach that has been adopted for defining GEP. **Quality checks**: Conditional check: Report if gepDefined is 'Yes'.
Schema element: gepBiology **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. Indicate whether GEP has been defined in terms of biology (BQEs). **Quality checks**: Conditional check: Report if gepDefined is 'Yes'.
Schema element: mitigationMeasures **Field type / facets:** MitigationMeasure_Enum (see Annex 8m) **Properties:** maxOccurs = unbounded minOccurs = 0 **Guidance on completion of schema element**: Conditional. Select the mitigation measures without significant adverse effects on the use or the wider environment from the enumeration list that have been identified to define GEP. More than one mitigation measure may be selected. **Quality checks**: Conditional check: Report if gepDefined is 'Yes'.
Schema element: bqeForMEPGEP **Field type / facets:** BQE_Enum (see Annex 8h): **Properties:** maxOccurs = unbounded minOccurs = 0 **Guidance on completion of schema element**: Conditional. Select the BQEs from the enumeration list for which biological values were derived to define MEP and GEP. More than one BQE may be selected. **Quality checks**: Conditional check: Report if gepDefined is 'Yes'.
Schema element: gesGepComparison **Field type / facets:** YesNoCode_Enum: Yes, No

Properties: maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. Indicate whether good ecological status (GES) and GEP have been compared, e.g. measured on a common scale[81]. If 'Yes', provide a document describing the comparison that has been carried out. If 'No', provide a document explaining why a comparison has not been carried out. Provide a reference or hyperlink to the relevant document and section where specific information can be found. This information must be uploaded to WISE or made available on the web. Guidance on the naming of files and documents to be uploaded to WISE is included in the user manual for reporting to WISE (see Annex 6). If a hyperlink to information stored on a Member State's server is reported, the Member State must guarantee that the hyperlink will remain stable and active for a period of 6 years after reporting, and that the information referred to will not be revised or updated. **Quality checks**: Conditional check: Report if gepDefined is 'Yes'.
Schema element: ecologicalStatusMethodReference **Field type / facets:** ReferenceType (see Annex 9) **Properties:** maxOccurs =unbounded minOccurs = 1 **Guidance on completion of schema element**: Required. Provide references or hyperlinks to technical documents describing the methodologies used for the assessment of ecological status. Guidance on what should be included in this document is provided in Section 7.3.3.3.
Schema element: gepMethodReference **Field type / facets:** ReferenceType (see Annex 9) **Properties:** maxOccurs =unbounded minOccurs = 1 **Guidance on completion of schema element**: Required. Provide references or hyperlinks to technical documents describing the methodologies used for the assessment of ecological potential. Guidance on what should be included in this document is provided in Section 7.3.3.3.
Schema element: driversFailureEcologicalStatusPotentialReference **Field type / facets:** ReferenceType (see Annex 9) **Properties:** maxOccurs =unbounded minOccurs = 1 **Guidance on completion of schema element**: Required. Provide references or hyperlinks to technical documents describing the drivers and impacts behind the failures of good ecological status and potential. Guidance on what should be included in this document is provided in Section 7.3.3.3.

[81] On comparability between GEP and GES, see conclusions of the 2010 CIS HMWB workshop, paragraph 60A: https://circabc.europa.eu/sd/a/cd419883-ff4d-4d43-a82b-aef3d33e04ed/Conclusions%20HMWB%20workshop%20Brussels%20March%202009.pdf

7.3.3.3. Guidance on contents of RBMPs/background documents

The following provides guidance on the aspects that the European Commission expects to find in the relevant chapters on methodologies in the RBMPs or in background documents. This guidance is not intended to be comprehensive in terms of what the Member States have to include in their RBMPs or background documents, rather to provide certain concrete elements of information that the European Commission expects to find.

Development of ecological status methods

- Method for the aggregation of monitoring data from different monitoring sites within a surface water body to derive an overall assessment of status.
- Methodology to deal with the no-deterioration objective when classifying surface water bodies, in particular for water bodies close to the high/good or good/moderate boundaries and considering the development of pressures on the water body.
- Development of fully WFD compliant assessment methods for the biological, hydromorphological and physico-chemical QEs.
- Remaining gaps and inconsistences in assessment methods described, with plans identified for their resolution.
- Major changes between the first and second RBMPs in the assessment methodology of ecological status.
- Methods used for translating the results from intercalibrated types to all other national types.
- Description of the application of the 'one-out, all-out' principle. If this has not been applied, a detailed justification and description of the alternative procedure that has been used must be provided.
- Metholodology for the grouping of surface water bodies and deriving status of non-monitored water bodies.
- Methods for assessing the confidence and precision of the different parts of the classification system; confidence and precision achieved; and plans in place to improve the level of confidence and precision, if any.
- Methodology for the selection of River Basin Specific Pollutants (RBSP).

Development of GEP

- Information on the comparison between the Prague Approach and the CIS Approach for the identification of GEP, if this has been done.
- Information on the mitigation measures that have been identified to achieve GEP and the ecological changes or improvements expected to be achieved.

- Information on how the slight deviation of GEP from MEP has been defined in terms of biological values (CIS Approach) or excluded mitigation measures (Prague Approach).
- Information on the comparison of GES and GEP, if this has been done.
- A description of the ecological changes that the mitigation measures are designed to achieve.
- Clarification in terms of which ecological improvements will be achieved by implementing the selected mitigation measures for reaching GEP.

Drivers and impacts behind failure

Include the following table in the RBMP or background document on the drivers and impacts behind the failure of ecological status. The cells should contain the number of surface water bodies failing due to the relevant driver and impact. Surface water bodies may fail due to more than one combination of drivers and impacts and, therefore, the reported values when summed are not expected to equate to the total number of failing surface water bodies. Ideally, this table should be developed for each surface water category (or at least differentiating coastal waters from the other surface water categories).

Impact / Driver	Agri-culture	Climate change	Energy hydro-power	Energy non-hydro-power	Fisheries and aqua-culture	Flood protection	Forestry	Industry	Tourism and recreation	Transport	Urban developmen t	Unknown / Other
N pollution												
P pollution												
Organic pollution												
Chemical pollution												
Saline pollution												
Acidification												
Elevated temperatures												
Altered habitats due to hydrological changes												
Altered habitats due to morphological changes												
Microbiological pollution												
Other significant impacts												

There will be cases where data and information are not available to produce this kind of table. This may be particularly the case for certain pressures which are more difficult to quantify and/or in complex RBDs subject to many pressures where it is difficult to disaggregate the pressure-measure relationships.

On this basis, Member States are requested to report data and information to the best extent possible and, for the pressures, where this information is available or can be derived on the basis of reasonable efforts. In this regard, lack of reporting of this information does not imply a failure to comply with the WFD obligations.

References:

For further information, refer to the following CIS Guidance Documents:

- CIS Guidance Document No. 2: Identification of Water Bodies[82]
- CIS Guidance Document No. 4: Identification and Designation of Heavily Modified and Artificial Water Bodies[83]
- CIS Guidance Document No. 5: Transitional and Coastal Waters – Typology, Reference Conditions and Classification Systems[84]
- CIS Guidance Document No. 10: Rivers and Lakes - Typology, Reference Conditions and Classification Systems.[85]
- CIS Guidance Document No. 13: Overall Approach to the Classification of Ecological Status and Ecological Potential[86]

7.4. Methodologies classification chemical status

7.4.1. Introduction

The legislation covering the assessment of chemical status is presented in detail in the introduction to Section 2.5.

Annex V of the WFD specifies how Member States are to monitor and present chemical status classification. The European Commission needs to ensure that chemical status has been addressed according to the provisions of the Directive, and in a consistent and comparable way throughout the EU. The normative provisions of Annex V provide a starting point. However, interpretation and application of these provisions may differ, which may lead to a wide range of variation between the Member States. It is, therefore, important to be able to compare the criteria and thresholds that Member States have applied.

The RBMPs should include information at RBD level on trend monitoring according to Article 3(3) of the Environmental Quality Standards Directive (Directive 2008/105/EC)[87] and on the designation of mixing zones according to Article 4. Where a Member State has designated mixing zones, the RBMP must include a description of:

- The approaches and methodologies applied to define such zones.

[82] https://circabc.europa.eu/sd/a/655e3e31-3b5d-4053-be19-15bd22b15ba9/Guidance%20No%202%20-%20Identification%20of%20water%20bodies.pdf

[83] https://circabc.europa.eu/sd/a/f9b057f4-4a91-46a3-b69a-e23b4cada8ef/Guidance%20No%204%20-%20heavily%20modified%20water%20bodies%20-%20HMWB%20(WG%202.2).pdf

[84] https://circabc.europa.eu/sd/a/85912f96-4dca-432e-84d6-a4dded785da5/Guidance%20No%205%20-%20characterisation%20of%20coastal%20waters%20-%20COAST%20(WG%202.4).pdf

[85] https://circabc.europa.eu/sd/a/dce34c8d-6e3d-469a-a6f3-b733b829b691/Guidance%20No%2010%20-%20references%20conditions%20inland%20waters%20-%20REFCOND%20(WG%202.3).pdf

[86] https://circabc.europa.eu/sd/a/06480e87-27a6-41e6-b165-0581c2b046ad/Guidance%20No%2013%20-%20Classification%20of%20Ecological%20Status%20(WG%20A).pdf

[87] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:348:0084:0097:en:PDF

- The measures taken with a view to reducing the extent of the mixing zones in the future.

7.4.2. How will the European Commission and the EEA use the information reported?

Information reported by Member States on will be used by the European Commission to establish whether Member States have properly implemented the requirements of the WFD and EQSD in relation to the application of EQSs for Priority Substances, trend monitoring and the implementation of the provisions relating to mixing zones. Statistical tables of the main methodological methods used will be produced.

Statistics and information will be provided to the European Parliament at EU wide level. Information will be provided to the public through WISE.

7.4.3. Contents of the 2016 reporting

7.4.3.1. Schema sketch

See Annex 10.5.

7.4.3.2. Information and data to be reported using the schemas

Provide information on all the standards used for the assessment of chemical status for all substances. This part of the schema will make reference to the values from the version of Directive 2008/105/EC[87] in force on 13 January 2009, except for the AA-EQS for naphthalene in transitional and coastal waters, which will be from the version of that Directive in force since 14 September 2013[88].

Schema: SWMET (continued)
Class SWPrioritySubstance *Properties: maxOccurs = unbounded minOccurs = 1*
Schema element: psCode Field type / facets: PS_Enum (see Annex 8d) Properties: maxOccurs =1 minOccurs = 1 Guidance on completion of schema element: Required. There will be one entry per Priority Substance. Report the information in each of the following schema elements for each Priority Substance. Quality checks: Within-schema check: there should be at least 1 entry per priority substance (except for aldrin, dieldrin, endrin, isodrin and Total PAHs that do not need to be reported here – instead it needs to be reported Total aldrin+dieldrin+endrin+isodrin and individual PAHs in the Annex 1 to the EQS Directive).

[88] See recital 9 of Directive 2013/39/EU and Article 3 paragraph 1a of Directive 2008/105/EC as amended by Directive 2013/39/EU. Directive 2013/39/EU adopts a less stringent AA-EQS for Naphthalene in transitional and coastal waters. In the case of Naphthalene this standard should be applied in the determination of chemical status. For all other substances the standards from Directive 2008/105/EC as in force on 13 January 2009 should be applied.

Schema element: psStatusAssessment **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether the Priority Substance has been used in the assessment of chemical status.
Schema element: psStandardsUsed **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. For each Priority Substance indicate whether the only standards used are all the relevant ones from the version of Directive 2008/105/EC in force on 13 January 2009, except for the AA-EQS for naphthalene in transitional and coastal waters, which will be from the version of that Directive in force since 14 September 2013. If alternative or additional standards (for the same or other matrix, for particular water categories) are used for that substance reply 'No'. If all and no other standard than those in the EQSD are used reply 'Yes'. In case alternative and/or additional standards are used for a particular substance Member States are required to report all the standards used for the particular Priority Substance using the schema elements below.
Schema element: psMatrix **Field type / facets:** Matrix_Enum: Water Biota Biota - fish Biota - other Sediment Sediment - settled sediment Sediment - suspended sediment **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. Select the matrix in which the standard for the Priority Substance is applied for the purpose of assessment of chemical status. **Quality checks**: Conditional check: report if psStandardsUsed is 'No'.
Schema element: psCategoryRW **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. Is this standard used for the assessment of chemical status in rivers? **Quality checks**: Conditional check: report if psStandardsUsed is 'No'.

Schema element: psCategoryLW **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. Is this standard used for the assessment of chemical status in lakes? **Quality checks**: Conditional check: report if psStandardsUsed is 'No'.
Schema element: psCategoryTW **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. Is this standard used for the assessment of chemical status in transitional waters? **Quality checks**: Conditional check: report if psStandardsUsed is 'No'.
Schema element: psCategoryCW **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. Is this standard used for the assessment of chemical status in coastal waters? **Quality checks**: Conditional check: report if psStandardsUsed is 'No'.
Schema element: psCategoryTeW **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. Is this standard used for the assessment of chemical status in territorial waters? **Quality checks**: Conditional check: report if psStandardsUsed is 'No'.
Schema element: psStandardType **Field type / facets:** EQStandardType_Enum: AA-EQS MAC-EQS Both Other **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional.Select the type of standard applied for each Priority Substance and matrix. 'AA-EQS' = Annual Average EQS. 'MAC-EQS' = Maximum Allowable Concentration EQS.'Both' = Both AA and MAC EQS

'Other' = Other type of standard **Quality check**: Conditional check: report if psStandardsUsed is 'No'.
Schema element: psValue **Field type / facets:** String20Type **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. For every combination of Priority Substance, matrix, standard type and category, report the value or range of the standard applied. **Quality checks**: Conditional check: report if psStandardsUsed is 'No'.
Schema element: psUnit **Field type / facets:** UnitOfMeasure_Enum (see Annex 8f) **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. Report the unit of the Priority Substance standard. **Quality checks**: Conditional check: report if psStandardsUsed is 'No'.
Schema element: psScale **Field type / facets:** GeographicalScale_Enum (see Annex 8l) **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. Report the level at which the standard has been set. **Quality checks**: Conditional check: report if psStandardsUsed is 'No'.
Schema element: psAnalyticalMethod **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether the analytical method used meets the minimum performance criteria laid down in Article 4.1 of the QA/QC Directive (2009/90/EC)[89] for the strictest standard applied. See Section 7.4.1 on fulfilment of the QA/QC Directive.
Schema element: psAnalyticalMethodBAT **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. If the analytical method does not meet the minimum performance criteria laid down in Article 4(1) of the QA/QC Directive, indicate whether the analytical method complies with the requirements laid down in Article 4.2 of the QA/QC Directive (2009/90/EC)[89] for the strictest standard applied.

[89] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:201:0036:0038:EN:PDF

Quality checks: Conditional check: Report if psAnalyticalMethod is 'No'.

The following class is used to provide information on the methodology for the classification of chemical status at the level of the RBD.

Schema: SWMET (continued)
Class SWChemicalStatusClassificationRBD *Properties: maxOccurs = 1 minOccurs = 1*
Schema element: percentageSWBNotMonitoredChemical **Field type / facets:** NumberDecimal0100Type **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Report the overall percentage of surface water bodies (for all categories) for which there is no monitoring of chemical status.
Schema element: approachSWBNotMonitoredChemical **Field type / facets:** ApproachSWBNotMonitoredChemical_Enum: Not relevant as all surface water bodies have been sufficiently monitored for chemical status Surface water bodies not monitored for chemical status are reported as good status Surface water bodies not monitored for chemical status are reported as unknown status The status of surface water bodies not monitored for chemical status has been derived or extrapolated from monitoring available for comparable water bodies **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Report the approach taken for the assessment of chemical status in surface water bodies which have not been monitored.
Schema element: approachSWBNotMonitoredChemicalReference **Field type / facets:** ReferenceType (see Annex 9) **Properties:** maxOccurs =unbounded minOccurs = 0 **Guidance on completion of schema element**: Conditional. If the assessment of chemical status of surface water bodies which have not been monitored is derived or extrapolated from monitoring in other comparable surface water bodies, provide references or hyperlinks to technical documents describing how the assessment of chemical status was carried out. Guidance on what should be included in this document is provided in Section 7.4.3.3. **Quality checks**: Conditional check: Report if approachSWBNotMonitoredChemical is 'The status of surface water bodies not monitored for chemical status has been derived or extrapolated from monitoring available for comparable water bodies'.
Schema element: limitOfQuantification **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 1

Guidance on completion of schema element: Required. Indicate whether the method of dealing with measurements lower than the limit of quantification is as specified in Article 5 of the QA/QC Directive (2009/90/EC)?
Schema element: backgroundConcentrations **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether natural background concentrations for metals and their compounds are taken into consideration where such concentrations prevent compliance with the relevant EQS.
Schema element: backgroundConcentrationsReference **Field type / facets:** ReferenceType (see Annex 9) **Properties:** maxOccurs =unbounded minOccurs = 0 **Guidance on completion of schema element**: Conditional. If natural background concentrations for metals and their compounds are taken into consideration where such concentrations prevent compliance with the relevant EQS, provide references or hyperlinks to technical documents where further specific information can be found, particularly the list of metals concerned. Guidance on what should be included in this document is provided in Section 7.4.3.3. **Quality checks**: Conditional check: Report if backgroundConcentrations is 'Yes'.
Schema element: bioavailability **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether hardness, pH, dissolved organic carbon or other water quality parameters that affect the bioavailability of metals are taken into consideration when assessing monitoring results against relevant EQSs.
Schema element: bioavailabilityReference **Field type / facets:** ReferenceType (see Annex 9) **Properties:** maxOccurs =unbounded minOccurs = 0 **Guidance on completion of schema element**: Conditional. If water quality parameters affecting the bioavailability of metals are taken into consideration when assessing monitoring results against relevant EQSs, provide references or hyperlinks to technical documents where further specific information can be found, particularly the list of metals concerned. Guidance on what should be included in this document is provided in Section 7.4.3.3. **Quality checks**: Conditional check: Report if bioavailability is 'Yes'.
Schema element: longTermTrendAnalysis **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether arrangements are in place for the long-term trend analysis of concentrations of those Priority Substances listed in Part A of

Annex I of the EQS Directive 2008/105/EC[90] that tend to accumulate in sediment and/or biota (Article 3(3) EQSD).
Schema element: longTermTrendAnalysisReference **Field type / facets:** ReferenceType (see Annex 9) **Properties:** maxOccurs =unbounded minOccurs = 0 **Guidance on completion of schema element**: Conditional. If arrangements are in place for the long-term trend analysis of concentrations of those Priority Substances listed in Part A of Annex I of the EQS Directive 2008/105/EC that tend to accumulate in sediment and/or biota (Article 3(3) EQSD), provide references or hyperlinks to technical documents where further specific information can be found, particularly the list of Priority Substances concerned. Guidance on what should be included in this document is provided in Section 7.4.3.3. **Quality checks**: Conditional check: Report if longTermTrendAnalysis is 'Yes'.
Schema element: mixingZoneDesignation **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether mixing zones have been designated under Article 4 of the EQSD.
Schema element: mixingZoneMethodology **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. Indicate whether the methodology for the designation of Mixing Zones in the RBD/Sub-unit follows the tiered approach as laid down in the 'Technical Background Document on Identification of Mixing Zones'[91]. **Quality checks**: Conditional check: Report if mixingZoneDesignation is 'Yes'.
Schema element: alternativeMixingZoneMethodologyReference **Field type / facets:** ReferenceType (see Annex 9) **Properties:** maxOccurs =unbounded minOccurs = 0 **Guidance on completion of schema element**: Conditional. If the methodology for the designation of Mixing Zones in the RBD/Sub-unit does not follow the tiered approach as laid down in the 'Technical Background Document on Identification of Mixing Zones', provide references or hyperlinks to technical documents describing the alternative methodology applied. Guidance on what should be included in this document is provided in Section 7.4.3.3.

[90] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:348:0084:0097:en:PDF

[91] https://circabc.europa.eu/sd/d/78ce94bb-6f1c-4379-87ac-88a18967c4c3/Technical%20Background%20Document%20on%20the%20Identification%20of%20Mixing%20Zones.doc

Quality checks: Conditional check: Report if mixingZoneMethodology is 'No'.
Schema element: mixingZoneMeasures **Field type / facets:** MixingZoneMeasures_Enum: Measures according to Article 11(3)(k) of the WFD (2000/60/EC) Review of permits referred to in Directive 2008/1/EC Prior regulations referred to in Article 11(3)(g) of the WFD (2000/60/EC) Other **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. Indicate the measures taken with a view to reducing the extent of the Mixing Zones in the future. **Quality checks**: Conditional check: Report if mixingZoneDesignation is 'Yes'.
Schema element: mixingZoneMeasuresReductionReference **Field type / facets:** ReferenceType (see Annex 9) **Properties:** maxOccurs =unbounded minOccurs = 0 **Guidance on completion of schema element**: Conditional. Provide references or hyperlinks to documents describing the measures taken with a view to reducing the extent of Mixing Zones in the future. Guidance on what should be included in this document is provided in Section 7.4.3.3. **Quality checks**: Conditional check: Report if mixingZoneDesignation is 'Yes'.
Schema element: chemicalStatusReference **Field type / facets:** ReferenceType (see Annex 9) **Properties:** axOccurs =unbounded minOccurs = 1 **Guidance on completion of schema element**: Required. Provide references or hyperlinks to documents describing the methodology for the assessment of chemical status. Guidance on what should be included in this document is provided in Section 7.4.3.3.

7.4.3.3. Guidance on contents of RBMPs/Background Documents

The following provides guidance on the aspects that the European Commission expects to find in the relevant chapters on methodologies in the RBMPs or in background documents. This guidance is not intended to be comprehensive in terms of what the Member States have to include in their RBMPs or background documents, rather to provide certain concrete elements of information that the European Commission expects to find.

- Information on the significant changes that have taken place, if any, since the first RBMP on the methodology or the basis of information used for the assessment of chemical status.
- Information on the approach taken in the assessment of chemical status in surface water bodies for which there is no monitoring. If status has been derived or extrapolated from

monitoring data in comparable surface water bodies, explain how this has been done and in how many instances.

- Detailed information on how measurements lower than the limit of quantification are dealt with, if different from the EQSD 2009/90/EC[92].
- Detailed information on the methodology for dealing with natural background concentrations.
- Detailed information on the methodology for dealing with pH, Dissolvable Organic Carbon or other water quality parameters that affect the bioavailability of metals.
- Detailed information on the methodology for long term trend analysis of Priority Substances;
- Detailed information on the measures to be taken to reduce the extent of Mixing Zones.
- Detailed methodology for the designation of Mixing Zones.

7.5. Overall management objectives (nutrients, river continuity)

7.5.1. Introduction

Some Member States have established management objectives to address a specific issue. Reporting on these objectives can provide useful quantitative information about objectives at RBD level.

Only Member States that have developed overall management objectives should provide this information.

7.5.2. Contents of the 2016 reporting

7.5.2.1. Schema sketch

See Annex 10.5.

7.5.2.2. Information to be reported using the schema

Schema: SWMET (continued)
Class SWManagementObjectives *Properties: maxOccurs = 1 minOccurs = 1*
Schema element: managementObjectivesNutrients Field type / facets: YesNoCode_Enum: Yes, No Properties: maxOccurs =1 minOccurs = 1

[92] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:201:0036:0038:EN:PDF

Guidance on completion of schema element: Required. Indicate whether overall management objectives have been set for nutrient pollution.
Schema element: managementObjectivesNutrientsQuantitativeN **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. Indicate whether quantitative objectives have been set in terms of nitrogen load reduction. **Quality checks**: Conditional check: Report if managementObjectivesNutrients is 'Yes'.
Schema element: managementObjectivesNutrientsQuantitativeP **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. Indicate whether quantitative objectives have been set in terms of phosphorus load reduction. **Quality checks**: Conditional check: Report if managementObjectivesNutrients is 'Yes'.
Schema element: managementObjectivesContinuity **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether overall management objectives have been set for river continuity.
Schema element: managementObjectivesContinuityQuantitative **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. Indicate whether quantitative objectives have been set in terms of river continuity (e.g. km of rivers connected, number of obstacles to be made passable, etc). **Quality checks**: Conditional check: Report if managementObjectivesContinuity is 'Yes'.
Schema element: managementObjectivesReference **Field type / facets:** ReferenceType (see Annex 9) **Properties:** maxOccurs =unbounded minOccurs = 0 **Guidance on completion of schema element**: Conditional. Provide references to the documents and sections where further information on the management objectives can be found. Guidance on what should be included in this document is provided in Section 7.5.2.3. **Quality checks**: Conditional check: Report if managementObjectivesContinuity or managementObjectivesNutrients is 'Yes'.
Schema element: waterResourcePlans **Field type / facets:** YesNoRBMPCode_Union_Enum: Yes, No, RBMP

Properties: maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether separate Water Resource Plans have been developed in relation to abstractions and e-flows or whether this topic is included in the RBMP.
Schema element: waterResourcePlansReference **Field type / facets:** ReferenceType (see Annex 9) **Properties:** maxOccurs =unbounded minOccurs = 0 **Guidance on completion of schema element**: Conditional. If there are Water Resource Plans please upload or provide the hyperlinks to the relevant documents. **Quality checks**: Conditional check: Report if waterResourcePlans is 'Yes'.

7.5.2.3. Guidance on contents of RBMPs/Background Documents

The following provides guidance on the aspects that the European Commission expects to find in the relevant chapters in the RBMPs or in background documents if management objectives have been set. This guidance is not intended to be comprehensive in terms of what the Member States have to include in their RBMPs or background documents, rather to provide certain concrete elements of information that the European Commission expects to find.

- For nutrient load, the current nutrient load, the target nutrient load for each RBD/Sub-unit and the load reduction required for the impacted groups of surface water bodies.
- For continuity, the current status of continuity for each Sub-unit (yes, no, partial). This information should be provided for 2015, 2021, 2027 and the target date by when the Sub-unit will be connected to the river network.

Member States may also include information on other management objectives that have been set for other parameters.

7.6. Definition of significant pressures and impacts

7.6.1. Introduction

A key part of the characterisation of surface water bodies is the assessment of the risk that a surface water body may fail (in 2015) the objectives of the WFD unless appropriate measures are taken. The results of the risk assessment inform the monitoring of surface water bodies and the subsequent classification of status. It is crucial that methodologies used in risk assessment are fit for purpose in the sense of being able to identify and quantify all significant pressures within the RBD and their potential impact on status of surface water bodies (CIS Guidance Document No. 3[93]). If not, (expensive) measures may be incorrectly targeted and objectives may (unexpectedly) not be met.

[93] https://circabc.europa.eu/sd/a/7e01a7e0-9ccb-4f3d-8cec-aeef1335c2f7/Guidance%20No%203%20-%20pressures%20and%20impacts%20-%20IMPRESS%20(WG%202.1).pdf

7.6.2. How will the European Commission and the EEA use the information reported?

The information will be used by the European Commission to ensure that the analysis of pressures and measures has been carried out in accordance with the provisions of the WFD, and in a consistent and comparable way throughout the EU.

In addition to the compliance assessment, a series of outputs will be produced identifying the most common tools used for the assessment of pressures and impacts, in order to promote best practice.

Statistics and information will be provided to the European Parliament at EU level. Information will be provided to the public through WISE.

7.6.3. Contents of the 2016 reporting

7.6.3.1. Schema sketch

See Annex 10.5.

7.6.3.2. Information and data to be reported using the Schemas

Schema: SWMET (continued)
Class SWPressures *Properties: maxOccurs = 1 minOccurs = 1*
Schema element: swPressuresNotAssessed Field type / facets: SignificantPressureType_Enum (see Annex 1a) Properties: maxOccurs =unbounded minOccurs = 1 Guidance on completion of schema element: Required. Select the pressure types from the enumeration list that have not been assessed (i.e. pressure types that have not been considered because they were not deemed to be important in the RBD, no information was available, or any other reason). If all pressures have been assessed report 'Not applicable'. The option 'No significant pressure' is not valid.
Schema element: swSignificantPressurePointSourceTools Field type / facets: SignificantPressureTools_Enum: Numerical tools Expert judgment Combination of both Not assessed Properties: maxOccurs =1 minOccurs = 1 Guidance on completion of schema element: Required. Report the tools that have been used to define significant pressures from point sources. 'Numerical tools' includes modelling tools.
Schema element: swSignificantPressureDiffuseSourceTools Field type / facets: SignificantPressureTools_Enum:

Numerical tools Expert judgment Combination of both Not assessed **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Report the tools that have been used to define significant pressures from diffuse sources. 'Numerical tools' includes modelling tools.
Schema element: swSignificantPressureWaterAbstractionTools **Field type / facets:** SignificantPressureTools_Enum: Numerical tools Expert judgment Combination of both Not assessed **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Report the tools that have been used to define significant pressures from water abstractions. 'Numerical tools' includes modelling tools.
Schema element: swSignificantPressureWaterFlowTools **Field type / facets:** SignificantPressureTools_Enum: Numerical tools Expert judgment Combination of both Not assessed **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Report the tools that have been used to define significant pressures from water flow regulation and morphological alterations. 'Numerical tools' includes modelling tools.
Schema element: swSignificantPressureOtherSourceTools **Field type / facets:** SignificantPressureTools_Enum: Numerical tools Expert judgment Combination of both Not assessed **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Report the tools that have been used to define significant pressures from other sources. 'Numerical tools' includes modelling tools.

Schema element: swSignificanceDefinition **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether significance been defined in terms of thresholds.
Schema element: swSignificanceLinkFailure **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether the definition of significance is linked to the potential failure of objectives.
Schema element: swPressuresReference **Field type / facets**: ReferenceType (see Annex 9): **Properties:** maxOccurs =unbounded minOccurs = 1 **Guidance on completion of schema element**: Required. Provide references or hyperlinks to the relevant document and section where any other relevant information relating to pressure types can be found. Guidance on what should be included in this document is provided in Section 7.6.3.3.

7.6.3.3. Guidance on contents of RBMPs/background documents

The following provides guidance on the aspects that the European Commission expects to find in the relevant chapters on pressures and impacts in the RBMPs or in background documents. This guidance is not intended to be comprehensive in terms of what the Member States have to include in their RBMPs or background documents, rather to provide certain concrete elements of information that the European Commission expects to find.

Report under SWPressuresReference reference(s) to the RBMP/background documents where the following information can be found:

- Include an explanation of any major change in the criteria for the identification of pressures since the first RBMP, such as adding new pressures (e.g. invasive alien species) or not reporting pressures (e.g. diffuse pollution due to mercury pollution). Also report an explanation of the changes in the methodology or the criteria (e.g. thresholds) used for the assessment of significance as regards pressures and impacts.

- Provide details on the approach to the definition of 'significant pressure' in particular its relationship with thresholds which may have been set, the relationship with the risk assessment (i.e. the presence of any significant pressures meaning that the surface water body is at risk), and with status (i.e. significant pressures are compatible with good status).

- Information on the tools used to define significant pressures from:

    - Point sources.

- Diffuse sources.
- Abstractions.
- Water flow regulation and morphological alterations.
- Other sources.

- Provide the reasons why certain pressures have been excluded from the pressures and impacts analysis (if appropriate).
- Details on the thresholds used for the determination of significance.
- If thresholds have not been used, how has significance been defined?

7.7. Methodologies exemptions

7.7.1. Introduction

The WFD defines its Environmental Objectives in Article 4 and sets the aim for long-term sustainable water management. Article 4(1) defines the general objective of good status (or potential for AWBs and HMWBs) to be achieved in all surface water bodies by 2015, and introduces the principle of preventing any further deterioration of status.

A number of exemptions to the general objective are possible under certain conditions. Article 4(4) allows for an extension of the deadline beyond 2015, Article 4(5) allows for the achievement of less stringent objectives, Article 4(6) allows a temporary deterioration in the status of water bodies and Article 4(7) sets out conditions in which deterioration of status or failure to achieve certain of the WFD Environmental Objectives may be permitted for new modifications to the physical characteristics of surface water bodies, and deterioration from high to good status may be possible as a result of new sustainable human development activities.

The WFD provides the general framework on exemptions but there is scope for differences in understanding and implementation. From the outset of implementation, it was clear that the use of exemptions needed to be explained further and the rules for application had to be made clearer. These clarifications can be found in the CIS Guidance Document No. 20 on exemptions[94], which was developed over several years.

7.7.2. How will the European Commission and the EEA use the information reported?

The European Commission will use the information provided to determine whether the methodology used to justify exemptions is robust and complies with the requirements of the WFD.

In addition to the compliance assessment, a series of outputs will be produced identifying the most common tools used for the assessment of pressures and impacts, in order to promote best practice.

[94] https://circabc.europa.eu/sd/a/2a3ec00a-d0e6-405f-bf66-60e212555db1/Guidance_documentN%C2%B020_Mars09.pdf

Statistics and information will be provided to the European Parliament at EU level. Information will be provided to the public through WISE.

7.7.3. Contents of 2016 Reporting

7.7.3.1. Schema sketch

See Annex 10.5.

7.7.3.2. Information and data to be reported using the schemas

Schema: SWMET (continued)
Class SWExemptions *Properties: maxOccurs = 1 minOccurs = 1*
Schema element: swExemption44Impact Field type / facets: SignificantImpactType_Enum (see Annex 1b) Properties: maxOccurs =unbounded minOccurs = 1 Guidance on completion of schema element: Required. Select the impacts from the enumeration list that are causing the application of exemptions under Article 4(4). More than one impact may be selected. If Article 4(4) exemption has not been applied report 'NOTA - Not applicable'. The option NOSI - No significant impact ' is not valid.
Schema element: swExemption44Driver Field type / facets: Driver_Enum (see Annex 1c) Properties: maxOccurs =unbounded minOccurs = 1 Guidance on completion of schema element: Required. Select the drivers from the enumeration list that are causing the application of exemptions under Article 4(4). More than one driver may be selected. If Article 4(4) exemption has not been applied report 'Exemption not applied'.
Schema element: swExemption45Impact Field type / facets: SignificantImpactType_Enum (see Annex 1b) Properties: maxOccurs =unbounded minOccurs = 1 Guidance on completion of schema element: Required. Select the impacts from the enumeration list that are causing the application of exemptions under Article 4(5). More than one impact may be selected. If Article 4(5) exemption has not been applied report 'NOTA - Not applicable. The option ' NOSI - No significant impact ' is not valid.
Schema element: swExemption45Driver Field type / facets: Driver_Enum (see Annex 1c) Properties: maxOccurs =unbounded minOccurs = 1 Guidance on completion of schema element: Required. Select the drivers from the enumeration list that are causing the application of exemptions under Article 4(5). More than one driver may be selected. If Article 4(5) exemption has not been applied report 'Exemption not applied'.

Schema element: swDisproportionateCost **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate if disproportionate costs have been used as a reason for applying exemptions under Article 4(4) or 4(5) for surface water bodies.
Schema element: swDisproportionateCostScale **Field type / facets:** GeographicalScale_Enum (see Annex 8l) **Properties:** maxOccurs =unbounded minOccurs = 0 **Guidance on completion of schema element**: Conditional. Select the scale at which the calculation of costs was carried out in order to assess disproportionality from the enumeration list. **Quality checks**: Conditional check: report if swDisproportionateCost is 'Yes'.
Schema element: swDisproportionateCostAnalysis **Field type / facets:** DisproportionateCostAnalysis_Enum: Cost-benefit analysis Benefits assessment Assessment of the consequences of non-action Distribution of costs Social and sectoral impacts Affordability Cost-effectiveness analysis Other **Properties:** maxOccurs =unbounded minOccurs = 0 **Guidance on completion of schema element**: Conditional. Select the analysis tools from the enumeration list that were used in assessing disproportionate cost. More than one analysis tool may be selected. **Quality checks**: Conditional check: report if swDisproportionateCost is 'Yes'
Schema element: swDisproportionateCostAlternativeFinancing **Field type / facets:** DisproportionateCostAlternativeFinancing_Enum: Distribution of costs among polluters and users Use of public budget (national level) Use of public budget (regional level) Use of public budget (local level) Private investment EU funds International funds

Other **Properties:** maxOccurs =unbounded minOccurs = 0 **Guidance on completion of schema element**: Conditional. Select the alternative financing options from the enumeration list that have been considered to overcome the costs being disproportionate. More than one financing option may be selected. **Quality checks**: Conditional check: report if swDisproportionateCost is 'Yes'.
Schema element: swDisproportionateCostOtherEULegislation **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. Indicate whether the costs of basic measures listed in Article 11(3)(a) of the WFD have been explicitly excluded from the assessment of disproportionate cost. **Quality checks**: Conditional check: report if swDisproportionateCost is 'Yes'
Schema element: swTechnicalInfeasibility **Field type / facets:** TechnicalInfeasibility_Enum: No technical solution is available It takes longer to fix the problem than there is time available There is no information on the cause of the problem so the solution cannot be identified Other Technical infeasibility has not been used as a reason for exemption **Properties:** maxOccurs =unbounded minOccurs = 1 **Guidance on completion of schema element**: Required. Report how 'technical infeasibility' has been interpreted in the context of application of exemptions for surface water bodies. **Quality checks**: Within-schema check: the option 'Technical infeasibility has not been used as a reason for exemption' is not compatible with any other.
Schema element: swNaturalConditions **Field type / facets:** SWNaturalConditions_Enum: Re-establishment of flora and fauna Natural hydrogeological conditions Other Natural condition has not been used as a reason for exemption for surface water bodies **Properties:** maxOccurs =unbounded minOccurs = 1 **Guidance on completion of schema element**: Required. Report the elements considered when determining that natural conditions require an exemption under Article 4(4) or 4(5). **Quality checks**: Within-schema check: the option 'Natural condition has not been used as a reason for exemption for surface water bodies' is not compatible with any other.

Schema element: swExemption46 **Field type / facets:** Exemption46_Enum: Yes (accidents) Yes (extreme floods) Yes (prolonged droughts) Article 4(6) has not been applied **Properties:** maxOccurs =unbounded minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether Article 4(6) has been applied and, if so, for what reason. **Quality checks**: Within-schema check: the option 'Article 4(6) has not been applied' is not compatible with any other.
Schema element: swExemption47 **Field type / facets:** Exemption47_Enum: Hydropower plants Flood protection schemes Navigation projects Impoundment for drinking water supply Mining project Other Article 4(7) has not been applied **Properties:** maxOccurs =unbounded minOccurs = 1 **Guidance on completion of schema element**: Required. Select the modifications from the enumeration list that have led to the application of the exemption under Article 4(7). More than one modification may be selected. **Quality checks**: Within-schema check: the option 'Article 4(7) has not been applied' is not compatible with any other.
Schema element: swExemptionsTransboundary **Field type / facets:** YesNoNotApplicable_Union_Enum: Yes, No, Not applicable **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether the application of exemptions has been co-ordinated in a transboundary context. Report 'Not applicable' if the RBD is not international.
Schema element: swExemptionsReference **Field type / facets:** ReferenceType (see Annex 9) **Properties:** maxOccurs =unbounded minOccurs = 1 **Guidance on completion of schema element**: Required. Provide references or hyperlinks to the

relevant documents and sections where specific information on the application of exemptions in surface water bodies can be found. Guidance on what should be included in this document is provided in Section 7.7.3.3.
Schema element: driversSWExemptionsReference **Field type / facets:** ReferenceType (see Annex 9) **Properties:** maxOccurs =unbounded minOccurs = 1 **Guidance on completion of schema element**: Required. Provide references or hyperlinks to the relevant documents and sections where information on the drivers behind exemptions for surface water bodies can be found. Guidance on what should be included in this document is provided in Section 7.7.3.3.

7.7.3.3. Guidance on contents of RBMPs/background documents

The following provides guidance on the aspects that the European Commission expects to find in the relevant chapters on exemptions in the RBMPs or in background documents. This guidance is not intended to be comprehensive in terms of what the Member States have to include in their RBMPs or background documents, rather to provide certain concrete elements of information that the European Commission expects to find.

- Analysis tools that were used in assessing disproportionate cost.
- Alternative financing options considered to overcome disproportionate cost and reasons for any options not taken further.
- Whether the costs of basic measures have been excluded from the assessment of disproportionate cost.
- The definition of technical infeasibility.
- The elements considered when determining that natural conditions require an exemption under Articles 4(4) and/or 4(5).
- If Article 4(6) is applied:
    - Description of the conditions under which circumstances that are exceptional or that could not reasonably have been foreseen may be declared, including the indicators used.
    - Description of the instances where Article 4(6) has been applied, the reasons, the levels of the indicators which make the circumstances exceptional, the surface water bodies affected and the extent of the impacts, the measures taken to restore surface water bodies affected, and the effects of such measures.
- For each application of Article 4(7), justification and explanation of the reasons for the project and the fulfilment of the conditions under Article 4(7), including:

  - Details on how the project has been assessed for deterioration of the status or failure to achieve WFD environmental objectives, based on a QE level.
  - How the assessment of cumulative effects has been considered in the application of Article 4(7).
  - The mitigation measures that are in place in relation to the application of Article 4(7).
  - The methodology for assessing over-riding public interest in the application of Article 4(7).
  - The methodology for assessing the benefits in the application of Article 4(7).
  - Details of the better environmental options that have been considered in the application of Article 4(7).

- Details of transboundary co-ordination that has taken place in the application of exemptions.

Drivers and impacts behind exemptions

- Include the following table in the RBMP or background document on the drivers and impacts behind exemptions to good status. The cells should contain the number of surface water bodies in which an exemption of any kind is applied relevant to each driver and impact. Surface water bodies may be exempted due to more than one combination of drivers and impacts and, therefore, the reported values when summed are not expected to equate to the total number of exempted surface water bodies. Ideally, this table should be developed for each surface water category (or at least differentiating coastal waters from the other surface water categories.

Impact / Driver	Agri-culture	Climate change	Energy hydro-power	Energy non-hydro-power	Fisheries and aqua-culture	Flood protection	Forestry	Industry	Tourism and recreation	Transport	Urban developmen t	Unknown / Other
N pollution												
P pollution												
Organic pollution												
Chemical pollution												
Saline pollution												
Acidification												
Elevated temperatures												
Altered habitats due to hydrological changes												
Altered habitats due to morphological changes												
Microbiological pollution												
Other significant impacts												

There will be cases where data and information are not available to produce this kind of table. This may be particularly the case for certain pressures which are more difficult to quantify and/or in complex RBDs subject to many pressures, where it is difficult to disaggregate the pressure-measure relationships.

On this basis, the Member States are requested to report data and information to the best extent possible and, for the pressures, where this information is available or can be derived on the basis of reasonable efforts. In this regard, lack of reporting of this information does not imply a failure to comply with the WFD obligations.

8. REPORTING AT RBD/SUB-UNIT LEVEL FOR GROUNDWATER (SCHEMA GWMET)

8.1. Overview of reporting of methodologies for groundwater bodies

Reporting of methodologies for groundwater bodies is done for each RBD. For the purpose of presentation in this guidance, the contents of reporting are structured according to the following sub-chapters:

- Methodologies characterisation
- Methodologies classification chemical status, upward trend assessment, trend reversal, quantitative status and transboundary co-ordination
- Definition of significant pressures and impacts
- Methodologies for exemptions

The following sections describe the contents of reporting. The UML diagram of the GWMET schema is found in Annex 10.6.

8.2. Methodologies characterisation groundwater bodies

8.2.1. Introduction

Article 5 of the WFD requires Member States to identify the location and boundaries of groundwater bodies that will be used for assessing progress with, and achievement of the WFDs Environmental Objectives.

Identifying the size of groundwater bodies was an important parameter that had implications on the design of the monitoring programmes and on the development of appropriate programmes of measures. For groundwater bodies, the WFD requires Member States to further characterise groundwater bodies at risk taking account of the relevant information listed in Annex II 2.2. Full identification should have been completed by 2010 for publication in the first RBMPs. The characterisation of groundwater bodies may have been reviewed and revised as part of the review and update (if necessary) of the Article 5 analysis, required by December 2013.

Article 5 of the WFD also requires Member States to analyse the characteristics of groundwater bodies and to provide a summary report on groundwater body characterisation.

8.2.2. How will the European Commission and the EEA use the information reported?

The European Commission will use the information provided to check that Member States have established and applied methodologies in accordance with the WFD and GWD, and whether the methodologies are comparable between Member States and RBDs. Statistics and information will be provided to the European Parliament at EU level. Information will be provided to the public through WISE.

8.2.3. Contents of the 2016 reporting

8.2.3.1. Schema sketch

See Annex 10.6.

8.2.3.2. Information and data to be reported using the schemas

Schema: GWMET
Class GWMethodologies *Properties: maxOccurs = 1 minOccurs = 1*
Schema element: gwCharacterisationReference Field type / facets / relationship: ReferenceType (see Annex 9) Properties: maxOccurs = unbounded minOccurs = 1 Guidance on completion of schema element: Required. There are no standard methodologies for the delineation and characterisation of groundwater bodies, therefore no targeted questions have been developed. Member States should, however, provide information relating to the initial characterisation and further characterisation of groundwater bodies. See Section 8.2.3.3 for the detailed information that is required. Provide references or hyperlinks to the relevant documents where specific information can be

found.

8.2.3.3. Guidance on contents of RBMPs/background documents

The following provides guidance on the aspects that the European Commission expects to find in the relevant chapters on characterisation in the RBMPs or in background documents. This guidance is not intended to be comprehensive in terms of what the Member States have to include in their RBMPs or background documents, rather to provide certain concrete elements of information that the European Commission expects to find.

In relation to the initial characterisation of groundwater bodies (WFD Annex II 2.1) the information provided in the RBMPs and background documents should include:

- How the uses of groundwater bodies and the degree to which they are at risk were assessed.
- The methodology for grouping groundwater bodies (if applicable).
- How significant flow has been identified in order to identify aquifers.
- How significant abstractions have been identified in order to identify aquifers.
- The specific criteria used for the delineation of groundwater bodies. The criteria may cover the following aspects:
    - Significant water flow.
    - Flow characteristics of geological strata.
    - Flow between strata within an aquifer.
    - Geological boundaries.
    - Other hydraulic boundaries.
    - Differences in status.
    - Connection to directly dependent surface water or terrestrial ecosystems.
    - Other.
- How the methodology for the initial characterisation of groundwater bodies has been refined in the second RBMPs.

In relation to the further characterisation of groundwater bodies at risk (WFD Annex II 2.2), information on how the following items have been addressed should be included in the RBMPs and background documents:

- Geological characteristics of the groundwater bodies including the extent and type of geological units.
- Hydrogeological characteristics of the groundwater bodies including hydraulic conductivity, porosity and confinement.
- Characteristics of the superficial deposits and soils in the catchment from which the groundwater bodies receive their recharge, including the thickness, porosity, hydraulic conductivity, and absorptive properties of the deposits and soils.
- Stratification characteristics of the groundwater within the groundwater bodies.
- Associated surface systems, including terrestrial ecosystems and bodies of surface water, with which the groundwater bodies are dynamically linked, including the direction and rates of exchange of water.
- The calculation of the long term annual average rate of overall recharge.
- The chemical composition of the groundwater.
- Any typologies for groundwater characterisation that have been developed.

8.3. Methodologies classification chemical status, upward trend assessment, trend reversal, quantitative status and transboundary co-ordination

8.3.1. Introduction

Annex V of the WFD specifies how Member States are to monitor groundwater, present chemical and quantitative status classification results and identify groundwater bodies with significant and sustained upward trends[95] in pollutant concentrations. The detailed provisions and criteria for chemical status and trend assessments are laid down in the Groundwater Directive (GWD)[96].

In addition to the reporting requirements of the WFD, the GWD introduces several additional reporting requirements to ensure that status and trends relating to groundwater bodies have been defined according to the provisions of the GWD, and in a consistent and comparable way across the EU.

The reporting requirements include threshold values: groundwater quality standards set by Member States. These have to be reported along with a summary of the methodology used for identifying the pollutants (or their indicators of pollution) and deriving the threshold value(s). The criteria for establishing threshold values are included in Article 3 and Annex I and II of the GWD (reporting obligations in GWD Article 3.5 and Annex II Part C). This is linked to the pressures and

[95] In this reporting sheet the term 'significant and sustained upward trends' refers to the definition in Article 2.3 of GWD.

[96] http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32006L0118&from=EN

impacts analysis required by Article 5 of the WFD, and Article 17 of the WFD relating to strategies to prevent and control pollution of groundwater.

According to Article 3.1(b) of the GWD, threshold values have to be established for pollutants, groups of pollutants and indicators of pollution – the relevant parameters – which have been identified as contributing to the characterisation of groundwater bodies as being at risk of not meeting the WFD Article 4 objectives, taking into account at least the list of the pollutants in GWD Part B Annex II.

The GWD requires that the methodology used to classify groundwater bodies in respect of chemical status is reported. The requirements are laid down in WFD Annex V, and GWD Article 4 and Annex III (reporting requirements in GWD Article 4.4 and Annex III point 5).

In addition, the GWD requires that the method used for trend assessment must be reported, including the way in which results from monitoring at individual monitoring sites have been used. The starting point for trend reversal and the reasons for selecting the starting point must also be reported. Requirements for the identification of upward trends and the definition of starting points for trend reversal are laid down in GWD Article 5 and Annex IV (reporting requirements in GWD Articles 5.4, 5.5 and Annex IV, Part A point 3).

8.3.2. How will the European Commission and the EEA use the information reported?

Information provided by Member States will be used to ascertain whether they have established and applied methodologies, in accordance with the WFD and GWD, for: deriving threshold values; assessing status (chemical and quantitative); and identifying environmentally significant pollutant trends (and starting points for trend reversal).

The European Commission will check that the methods applied are comparable between Member States and RBDs. The comparison of assessment criteria and thresholds will make the results of the status assessment more transparent and will allow any differences to be identified. Information on threshold values and the substances for which such values have been established will be summarised and analysed.

Statistics and information will be provided to the European Parliament at EU level. Information will be provided to the public through WISE.

8.3.3. Contents of the 2016 reporting

8.3.3.1. Schema sketch

See Annex 10.6.

8.3.3.2. Information and data to be reported using the schemas

Schema: GWMET (continued)
Class GWMethodologies (continued) ***Properties:*** *maxOccurs = 1 minOccurs = 1*
Schema element: diminutionDamage

Field type / facets: YesNoNotApplicable_Union_Enum: Yes, No, Not applicable

Properties: maxOccurs =1 minOccurs = 1

Guidance on completion of schema element: Required. Indicate whether diminution of surface water chemistry and ecology and damage to groundwater dependent terrestrial ecosystems due to transfer of pollutants from the groundwater body has been considered in the assessment of the chemical status.

Report 'Not applicable' if there are no groundwater dependent surface water or terrestrial ecosystems.

Schema element: methodCriterionExtentExceedance

Field type / facets: MethodCriteriumExtentExeedence_Enum:

Method 1: Proportion (%) of the number of monitoring sites exceeding a groundwater quality standard or threshold value compared to the total number of monitoring sites in the whole groundwater body

Method 2: Proportion (%) of the total area of the groundwater body represented by monitoring sites exceeding a groundwater quality standard or threshold value compared to the total area of the whole groundwater body.

Method 3: Proportion (%) of the total volume of the groundwater body represented by monitoring sites exceeding a groundwater quality standard or threshold value compared to the total volume of the whole groundwater body.

Other

None

Not relevant as no monitoring site exceeds any groundwater quality standard or threshold value for any pollutant

Properties: maxOccurs =1 minOccurs = 1

Guidance on completion of schema element: Required. Report which method or criterion has been applied to estimate the extent of the groundwater body that exceeds groundwater quality standards or threshold values, and what extent of the groundwater body exceeding groundwater quality standard or threshold value is considered acceptable for confirming good groundwater chemical status.

Schema element: proportionExceedanceAllowed

Field type / facets: NumberDecimal0100Type

Properties: maxOccurs =1 minOccurs = 0

Guidance on completion of schema element: Conditional. If Method 1, Method 2 or Method 3 has been used to estimate the extent of the groundwater body that exceeds groundwater quality standards or threshold values, state the proportion (%) of monitoring sites, area or volume (as appropriate) where exceedance is considered acceptable for confirming good groundwater chemical status.

Quality checks:

Conditional check: Report if MethodCriterionExtentExceedance is 'Method 1…', 'Method 2…' or

'Method 3…'.
Schema element: impactsGWAbstractionBalance **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Has whether the available groundwater resource is not exceeded by the long term annual average rate of abstraction been considered when assessing groundwater quantitative status? For further information regarding abstraction, refer to CIS Guidance Document No. 18 on groundwater status and trend assessment[97].
Schema element: impactsGWAbstractionSWObjective **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Has failure to achieve the Environmental Objectives specified under WFD Article 4 for associated surface water bodies resulting from anthropogenic water level alteration or change in flow conditions been considered when assessing groundwater quantitative status? For further information regarding abstraction, refer to CIS Guidance Document No. 18 on groundwater status and trend assessment[97].
Schema element: impactsGWAbstractionSWDiminutionStatus **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Has significant diminution in the status of surface waters resulting from anthropogenic water level alteration or change in flow conditions been considered when assessing groundwater quantitative status? For further information regarding abstraction, refer to CIS Guidance Document No. 18 on groundwater status and trend assessment[97].
Schema element: impactsGWAbstractionDamageGWDE **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Has significant damage to groundwater dependent terrestrial ecosystems resulting from an anthropogenic water level alteration been considered when assessing groundwater quantitative status? For further information regarding abstraction, refer to CIS Guidance Document No. 18 on groundwater status and trend assessment[97].
Schema element: impactsGWAbstractionSalineIntrusion

[97] https://circabc.europa.eu/sd/a/ff303ad4-8783-43d3-989a-55b65ca03afc/Guidance_document_N%C2%B018.pdf

Field type / facets: YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Has regional saline or other intrusions resulting from anthropogenically induced sustained changes in flow direction been considered when assessing groundwater quantitative status? For further information regarding abstraction, refer to CIS Guidance Document No. 18 on groundwater status and trend assessment.[97]
Schema element: availableGroundwaterResource **Field type / facets:** YesNoPartially_Union_Enum: Yes, No, Partially **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether the criterion of 'available groundwater resource' has been applied in accordance with WFD Article 2(27).
Schema element: needsTerrestrialEcosystems **Field type / facets:**YesNoNotApplicable_Union_Enum: Yes, No, Not applicable **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether the needs of the terrestrial ecosystems associated to groundwater bodies have been assessed. Report 'Not applicable' if there are no terrestrial ecosystems associated to groundwater bodies.
Schema element: balanceRechargeAbstraction **Field type / facets:** BalanceRechargeAbstraction_Enum: Method 1: A comparison of annual average groundwater abstraction against 'available groundwater resource' was calculated for every groundwater body Method 2: A comparison of annual average groundwater abstractions against 'available groundwater resource' in the groundwater body was calculated for a subset of all groundwater bodies Method 3: Where reliable information on groundwater levels across the groundwater body is available, data can be used to identify the presence of a sustained long-term decline in water levels caused by long-term groundwater abstraction. Where such a decline is present it will indicate that the conditions for good status are not being met and the body will be of poor status. Not considered **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Report the approach used to assess the balance between recharge and abstraction of groundwater. For further information regarding abstraction, refer to CIS Guidance Document No. 18 on groundwater status and trend assessment.[98]

[98] https://circabc.europa.eu/sd/a/ff303ad4-8783-43d3-989a-55b65ca03afc/Guidance_document_N%C2%B018.pdf

Schema element: trendAssessmentPerformed **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether trend assessment in groundwater pollutants been performed.
Schema element: trendAssessmentMethodology **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. If trend assessment in groundwater pollutants was performed, indicate whether a methodology for identifying significant and upward trends in any pollutant's concentration has been applied. **Quality checks**: Conditional check: Report if trendAssessmentPerformed is 'Yes'.
Schema element: timeSeries **Field type / facets:** YearRangeType **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. If trend assessment in groundwater pollutants was performed, state the starting and finishing year for the assessment in the format YYYY--YYYY. **Quality checks**: Conditional check: Report if trendAssessmentPerformed is 'Yes'.
Schema element: statisticalElements **Field type / facets:** StatisticalElements_Enum: Statistical significance Confidence intervals None **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. If trend assessment in groundwater pollutants was performed, select which statistical element was used from the enumeration list. **Quality checks**: Conditional check: Report if trendAssessmentPerformed is 'Yes'.
Schema element: additionalTrendAssessment **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether additional trend assessments were applied in order to assess the impacts of existing plumes of pollution (according to GWD Article 5(5).
Schema element: startingPointTrendReversal **Field type / facets:** StartingPointTrendReversal_Enum:

All starting points for trend reversal start from 75 % of the groundwater quality standards and threshold values. Some or all starting points for trend reversal start at a value that is not 75 % of the groundwater quality standards and threshold values. Starting points for trend reversal have not been established **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Report the starting points for trend reversal, at which level, and whether there is already a methodology available for the assessment of trend reversal.
Schema element: percentageStartingPoint **Field type / facets:** NumberDecimal0100Type **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. If the starting points for trend reversal are not 75 % of the groundwater quality standards and threshold values, provide the percentage starting point.
Schema element: trendReversalMethodology **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether a methodology for assessing trend reversal has been established.
Schema element: thresholdValueElementProtectionEcosystem **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Has the protection of aquatic ecosystems (surface waters) been considered during the establishment of the groundwater threshold values?
Schema element: thresholdValueElementProtectionGWDE **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Has the protection of groundwater dependent terrestrial ecosystems (e.g. wetlands) been considered during the establishment of the groundwater threshold values?
Schema element: thresholdValueElementProtectionUses **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Has the actual and potential legitimate uses and functions of groundwater (e.g. drinking water, irrigation, industrial use) been considered during the establishment of the groundwater threshold values?

Schema element: thresholdValueElementSalineIntrusion **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Have saline or other intrusions been considered during the establishment of the groundwater threshold values?
Schema element: thresholdValuesBackgroundLevels **Field type / facets:** ThresholdValuesBackgroundLevels_Enum: Background levels have been considered in the threshold value establishment Background levels have been considered in the status assessment but not in the threshold value establishment Background levels are considered in a different way Background levels have not been considered **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Report whether background levels of naturally occurring substances have been considered within the establishment of threshold values.
Schema element: transboundaryGWBPresent **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element:** Required. Indicate whether there are any transboundary groundwater bodies in the RBD.
Schema element: transboundaryThresholdValues **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. If transboundary groundwater bodies are identified, indicate whether the establishment of threshold values has been co-ordinated with the neighbouring countries concerned. **Quality checks**: Conditional check: Report if transboundaryGWBPresent is 'Yes'.
Schema element: gwMethodologiesChemicalClassificationReference **Field type / facets:** ReferenceType (see Annex 9) **Properties:** maxOccurs =unbounded minOccurs = 1 **Guidance on completion of schema element**: Required. Provide references or hyperlinks to the documents and sections where relevant information relating to methodologies for the classification of chemical status of groundwater, upward trend assessment and trend reversal can be found. Guidance on what should be included in this document is provided in Section 8.3.3.3.
Schema element: gwMethodologiesQuantitativeClassificationReference **Field type / facets:** ReferenceType (see Annex 9)

Properties: maxOccurs =unbounded minOccurs = 1 **Guidance on completion of schema element**: Required. Provide references or hyperlinks to the documents and sections where relevant information relating to methodologies for the classification of quantitative status of groundwater can be found. Guidance on what should be included in this document is provided in Section 8.3.3.3.
Schema element: gwMethodologiesTransboundaryReference **Field type / facets:** ReferenceType (see Annex 9) **Properties:** maxOccurs =unbounded minOccurs = 0 **Guidance on completion of schema element**: Conditional. Provide references or hyperlinks to the documents and sections where relevant information relating to transboundary co-ordination of threshold value setting can be found. Guidance on what should be included in this document is provided in Section 8.3.3.3. **Quality checks:** report if 'transboundaryGWBPresent' is 'Yes'.

The following class is used to report the pollutants or indicators of pollution for which threshold values have been established.

Schema: GWMET (continued)
Class ThresholdValue *Properties; maxOccurs = unbounded minOccurs = 1*
Schema element: pollutantIndicatorCode **Field type / facets:** ChemicalSubstances_Union_Enum (see Annex 8e) **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Select each pollutant or indicator of pollution in turn from the enumeration list for which threshold values have been established.
Schema element: pollutantIndicatorCodeOther **Field type / facets**: string250Type **Properties**: maxOccurs = 1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. If 'pollutantIndicatorCode' is 'EEA_00-00-0 Other chemical parameter' please indicate in this field the CAS number (if relevant) and the name of the pollutant or indicator. **Quality check**: Conditional check: report if 'pollutantIndicatorCode' is 'EEA_00-00-0 Other chemical parameter'.
Schema element: thresholdValue **Field type / facets:** String25Type **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element:** Required. Report the threshold value(s) established for

the selected pollutant or indicator of pollution. The threshold values established for nitrates and pesticides need only be reported if they are more stringent than the groundwater quality standards identified in GWD Annex. If different threshold values are applied at groundwater body level within the RBD, indicate the range of the threshold values applied.
Schema element: thresholdValueUnit Field type / facets: UnitOfMeasure_Enum (see Annex 8f) Properties: maxOccurs =1 minOccurs = 1 Guidance on completion of schema element: Required. Report the unit of measurement of the threshold value or range of threshold values.
Schema element: thresholdValueScale Field type / facets: GeographicalScale_Enum (see Annex 8l) Properties: maxOccurs =1 minOccurs = 1 Guidance on completion of schema element: Required. For each pollutant or indicator of pollution and threshold value or range of threshold values, report the level at which the threshold value is established.
Schema element: startingPointTrendReversal Field type / facets: String25Type Properties: maxOccurs =1 minOccurs = 1 Guidance on completion of schema element: Required. Report the percentage starting point for trend reversal. The default value is '75', i.e. 75 % of the threshold value. If different starting points for trend reversal are applied at groundwater body level within the RBD, indicate the range of the starting points applied.

8.3.3.3. Guidance on contents of RBMPs/background documents

The following provides guidance on the aspects that the European Commission expects to find in the relevant chapters on trend reversal and the establishment of threshold values in the RBMPs or in background documents. This guidance is not intended to be comprehensive in terms of what the Member States have to include in their RBMPs or background documents, rather to provide certain concrete elements of information that the European Commission expects to find.

- Details on whether diminution of surface water chemistry and ecology and damage to groundwater dependent terrestrial ecosystems due to transfer of pollutants from the groundwater body has been considered in the assessment of the chemical status.

- The method or criterion applied to estimate the extent of the groundwater body that exceeds groundwater quality standards or threshold values.

- The conditions or impacts of groundwater abstractions which have been considered when assessing groundwater quantitative status.
- How the criterion of 'available groundwater resource' has been applied in accordance with WFD Article 2(27).
- How the needs of the terrestrial ecosystems associated to groundwater bodies have been assessed.
- The approach used to assess the balance between recharge and abstraction of groundwater.
- Details on the time series of the trend assessment in groundwater pollutants.
- Details on the statistical element of the trend assessment in groundwater pollutants.
- Details on whether additional trend assessments were applied in order to assess the impacts of existing plumes of pollution (according to GWD Article 5(5)).
- Starting points for trend reversal which are different from 75 % of the groundwater quality standards or threshold values.
- The methodology used in the RBD for assessing trend reversal.
- Elements and Environmental Quality Objectives considered in the establishment of groundwater threshold values.
- Consideration of background levels in the establishment of threshold values.
- Co-ordination of establishment of threshold values for transboundary groundwater bodies.

8.4. Definition of significant pressures and impacts

8.4.1. Introduction

A key part of the characterisation of groundwater bodies is the assessment of the risk that a groundwater body may fail (in 2015) the objectives of the WFD unless appropriate measures are taken. The results of the risk assessment inform the monitoring of groundwater bodies and the subsequent classification of status. It is crucial that methodologies used in risk assessment are fit for purpose in the sense of being able to identify and quantify all significant pressures within the RBD and their potential impact on status of groundwater bodies (CIS Guidance Document 3[99]). If not, (expensive) measures may be incorrectly targeted and objectives may (unexpectedly) not be met.

[99] https://circabc.europa.eu/sd/a/7e01a7e0-9ccb-4f3d-8cec-aeef1335c2f7/Guidance%20No%203%20-%20pressures%20and%20impacts%20-%20IMPRESS%20(WG%202.1).pdf

8.4.2. How will the European Commission and the EEA use the information reported?

The information will be used by the European Commission to ensure that the analysis of pressures and measures has been carried out in accordance with the provisions of the WFD, and in a consistent and comparable way throughout the EU.

In addition to the compliance assessment, a series of outputs will be produced identifying the most common tools used for the assessment of pressures and impacts, in order to promote best practice.

Statistics and information will be provided to the European Parliament at EU level. Information will be provided to the public through WISE.

8.4.3. Contents of the 2016 reporting

8.4.3.1. Schema sketch

See Annex 10.6.

8.4.3.2. Information and data to be reported using the Schemas

Schema: GWMET (continued)
Class GWPressures *Properties: maxOccurs = 1 minOccurs = 1*
Schema element: gwPressuresNotAssessed Field type / facets: SignificantPressureType_Enum (see Annex 1a) Properties: maxOccurs =unbounded minOccurs = 1 Guidance on completion of schema element: Required. Select any pressure types from the enumeration list that have not been assessed (i.e. pressure types that have not been considered because they were not deemed to be important in the RBD, no information was available, or any other reason). If all pressures have been assessed report 'Not applicable'. The option 'No significant pressure' is not valid.
Schema element: gwSignificantPressurePointSourceTools Field type / facets: SignificantPressureTools_Enum: Numerical tools Expert judgment Combination of both Not assessed Properties: maxOccurs =1 minOccurs = 1 Guidance on completion of schema element: Required. Report the tools that have been used to define significant pressures from point sources. 'Numerical tools' includes modelling tools.
Schema element: gwSignificantPressureDiffuseSourceTools Field type / facets: SignificantPressureTools_Enum:

Numerical tools Expert judgment Combination of both Not assessed **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Report the tools that have been used to define significant pressures from diffuse sources. 'Numerical tools' includes modelling tools.
Schema element: gwSignificantPressureWaterAbstractionTools **Field type / facets:** SignificantPressureTools_Enum: Numerical tools Expert judgment Combination of both Not assessed **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Report the tools that have been used to define significant pressures from water abstractions. 'Numerical tools' includes modelling tools.
Schema element: gwSignificantPressureArtificialRecharge **Field type / facets:** SignificantPressureTools_Enum: Numerical tools Expert judgment Combination of both Not assessed **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Report the tools that have been used to define significant pressures from artificial recharge. 'Numerical tools' includes modelling tools.
Schema element: gwSignificantPressureOtherSourceTools **Field type / facets:** SignificantPressureTools_Enum Numerical tools Expert judgment Combination of both Not assessed **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Report the tools that have been used to define significant pressures from other sources. 'Numerical tools' includes modelling tools.
Schema element: gwSignificanceDefinition

Field type / facets: YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether significance has been defined in terms of thresholds.
Schema element: gwSignificanceLinkFailure **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether the definition of significance is linked to the potential failure of good status.
Schema element: gwPressuresReference **Field type / facets:** ReferenceType (see Annex 9) **Properties:** maxOccurs =unbounded minOccurs = 1 **Guidance on completion of schema element**: Required. Provide references or hyperlinks to the documents and sections where any relevant information relating to pressure types can be found. Guidance on what should be included in this document is provided in Section 8.4.3.3.

8.4.3.3. Guidance on contents of RBMPs/background documents

The following provides guidance on the aspects that the European Commission expects to find in the relevant chapters on pressures and impacts in the RBMPs or in background documents. This guidance is not intended to be comprehensive in terms of what the Member States have to include in their RBMPs or background documents, rather to provide certain concrete elements of information that the European Commission expects to find.

- A description of the tools used to define significant pressures from all sources including an assessment of their accuracy and reliability.
- Provide the reasons why certain pressures have been excluded from the pressures and impacts analysis (if appropriate).
- The definition of significance in terms of thresholds.
- How significance is linked to the failure of good status.

8.5. Methodologies exemptions

8.5.1. Introduction

The WFD defines its Environmental Objectives in Article 4 and sets the aim for long-term sustainable water management. Article 4(1) defines the general objective of good status to be achieved in all groundwater bodies by 2015, and introduces the principle of preventing any further deterioration of status.

A number of exemptions to the general objective are possible under certain conditions. Article 4(4) allows for an extension of the deadline beyond 2015, Article 4(5) allows for the achievement of less stringent objectives, Article 4(6) allows a temporary deterioration in the status of water bodies and Article 4(7) sets out conditions in which deterioration of status or failure to achieve certain of the WFD Environmental Objectives may be permitted for new modifications to the physical characteristics of surface water bodies, and deterioration from high to good status may be possible as a result of new sustainable human development activities.

The WFD provides the general framework on exemptions but there is scope for differences in understanding and implementation. From the outset of implementation it was clear that the use of exemptions needed to be explained further and the rules for application had to be made clearer. These clarifications can be found in the CIS Guidance Document No 20 on exemptions[100], which was developed over several years.

In addition, Article 6(3) of Directive 2006/118/EC[101] on the protection of groundwater against pollution and deterioration allows Member States to exempt inputs of pollutants to groundwaters from the programme of measures under certain specified circumstances.

8.5.2. How will the European Commission and the EEA use the information reported?

The European Commission will use the information provided to determine whether the methodology used to justify exemptions is robust and complies with the requirements of the WFD.

Statistics and information will be provided to the European Parliament at EU level. Information will be provided to the public through WISE.

8.5.3. Contents of the 2016 reporting

8.5.3.1. Schema sketch

See Annex 10.6.

8.5.3.2. Information and data to be reported using the schemas

Schema: GWMET (continued)
Class GWExemptions *Properties: maxOccurs = 1 minOccurs = 1*
Schema element: gwExemption44Impact Field type / facets: SignificantImpactType_Enum (see Annex 1b) Properties: maxOccurs =unbounded minOccurs = 1 Guidance on completion of schema element: Required. Select the impacts from the enumeration list

[100] https://circabc.europa.eu/sd/a/2a3ec00a-d0e6-405f-bf66-60e212555db1/Guidance_documentN%C2%B020_Mars09.pdf

[101] http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32006L0118&from=EN

that are causing the application of exemptions under Article 4(4). More than one impact may be selected. If Article 4(4) exemption has not been applied report 'NOTA - Not applicable. The option 'NOSI - No significant impact' is not valid.
Schema element: gwExemption44Driver **Field type / facets:** Driver_Enum (see Annex 1c) **Properties:** maxOccurs =unbounded minOccurs = 1 **Guidance on completion of schema element**: Required. Select the drivers from the enumeration list that are causing the application of exemptions under Article 4(4). More than one driver may be selected. If Article 4(4) exemption has not been applied report 'Exemption not applied'.
Schema element: gwExemption45Impact **Field type / facets:** SignificantImpactType_Enum (see Annex 1b) **Properties:** maxOccurs =unbounded minOccurs = 1 **Guidance on completion of schema element**: Required. Select the impacts from the enumeration list that are causing the application of exemptions under Article 4(5). More than one impact may be selected. If Article 4(5) exemption has not been applied report 'NOTA - Not applicable. The option 'NOSI - No significant impact' is not valid.
Schema element: gwExemption45Driver **Field type / facets:** Driver_Enum (see Annex 1c) **Properties:** maxOccurs =unbounded minOccurs = 1 **Guidance on completion of schema element**: Required. Select the drivers from the enumeration list that are causing the application of exemptions under Article 4(5). More than one driver may be selected. If Article 4(5) exemption has not been applied report 'Exemption not applied'.
Schema element: gwDisproportionateCost **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate if disproportionate costs have been used as a reason for applying exemptions under Article 4(4) or 4(5) for groundwater bodies.
Schema element: gwDisproportionateCostScale **Field type / facets:** GeographicalScale_Enum (see Annex 8l) **Properties:** maxOccurs =unbounded minOccurs = 0 **Guidance on completion of schema element**: Conditional. Select the scale at which the calculation of costs was carried out in order to assess disproportionality from the enumeration list. **Quality checks**: Conditional check: report if gwDisproportionateCost is 'Yes'.
Schema element: gwDisproportionateCostAnalysis **Field type / facets:** DisproportionateCostAnalysis_Enum: Cost-benefit analysis

Benefits assessment Assessment of the consequences of non-action Distribution of costs Social and sectoral impacts Affordability Cost-effectiveness analysis Other **Properties:** maxOccurs =unbounded minOccurs = 0 **Guidance on completion of schema element**: Conditional. Select the analysis tools from the enumeration list that were used in assessing disproportionate cost. More than one analysis tool may be selected. **Quality checks**: Conditional check: report if gwDisproportionateCost is 'Yes'
Schema element: gwDisproportionateCostAlternativeFinancing **Field type / facets:** DisproportionateCostAlternativeFinancing_Enum: Distribution of costs among polluters and users Use of public budget (national level) Use of public budget (regional level) Use of public budget (local level) Private investment EU funds International funds Other **Properties:** maxOccurs =unbounded minOccurs = 0 **Guidance on completion of schema element**: Conditional. Select the alternative financing options from the enumeration list that have been considered to overcome the costs being disproportionate. More than one financing option may be selected. **Quality checks**: Conditional check: report if gwDisproportionateCost is 'Yes'.
Schema element: gwDisproportionateCostOtherEULegislation **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. Indicate whether the costs of basic measures listed in Article 11(3)(a) of the WFD have been explicitly excluded from the assessment of disproportionate cost. **Quality checks**: Conditional check: report if gwDisproportionateCost is 'Yes'.
Schema element: gwTechnicalInfeasibility

Field type / facets: TechnicalInfeasibility_Enum:

No technical solution is available

It takes longer to fix the problem than there is time available

There is no information on the cause of the problem so the solution cannot be identified

Other

Technical infeasibility has not been used as a reason for exemption

Properties: maxOccurs =unbounded minOccurs = 1

Guidance on completion of schema element: Required. Report how 'technical infeasibility' has been interpreted in the context of application of exemptions for groundwater bodies.

Quality checks: Within-schema check: the option 'Technical infeasibility has not been used as a reason for exemption' is not compatible with any other.

Schema element: gwNaturalConditions

Field type / facets: GWNaturalConditions_Enum:

Natural hydrogeological conditions

Other

Natural condition has not been used as a reason for exemption for groundwater bodies

Properties: maxOccurs =unbounded minOccurs = 1

Guidance on completion of schema element: Required. Report the elements considered when determining that natural conditions require an exemption under Article 4(4) or 4(5).

Quality checks: Within-schema check: the option 'Natural condition has not been used as a reason for exemption for groundwater bodies' is not compatible with any other

Schema element: gwExemption46

Field type / facets: Exemption46_Enum:

Yes (accidents)

Yes (extreme floods)

Yes (prolonged droughts)

Article 4(6) has not been applied

Properties: maxOccurs =unbounded minOccurs = 1

Guidance on completion of schema element: Required. Indicate whether Article 4(6) has been applied and, if so, for what reason.

Quality checks: Within-schema check: the option 'Article 4(6) has not been applied' is not compatible with any other.

Schema element: gwExemption47

Field type / facets: Exemption47_Enum:

Hydropower plant

Flood protection schemes Navigation projects Impoundment for drinking water supply Mining project Other Article 4(7) has not been applied **Properties:** maxOccurs =unbounded minOccurs = 1 **Guidance on completion of schema element**: Required. Select the modifications from the enumeration list that have led to the application of the exemption under Article 4(7). More than one modification may be selected. **Quality checks**: Within-schema check: the option 'Article 4(7) has not been applied' is not compatible with any other.
Schema element: gwExemptionsTransboundary **Field type / facets:** YesNoNotApplicable _Enum: Yes, No, Not applicable **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether the application of exemptions has been co-ordinated in a transboundary context. Report 'Not applicable' if there are no transboundary groundwater bodies.
Schema element: gwExemptionsReference **Field type / facets:** ReferenceType (see Annex 9) **Properties:** maxOccurs =unbounded minOccurs = 1 **Guidance on completion of schema element**: Required. Provide references or hyperlinks to the relevant documents and sections where specific information on the application of exemptions to groundwater bodies can be found. Guidance on what should be included in this document is provided in Section 8.5.3.3.
Schema element: driversGWExemptionsReference **Field type / facets:** ReferenceType (see Annex 9) **Properties:** maxOccurs =unbounded minOccurs = 1 **Guidance on completion of schema element**: Required. Provide references or hyperlinks to the relevant documents and sections where information on the drivers behind exemptions for groundwater bodies can be found. Guidance on what should be included in this document is provided in Section 8.5.3.3.

8.5.3.3. Guidance on contents of RBMPs/background documents

The following provides guidance on the aspects that the European Commission expects to find in the relevant chapters on exemptions in the RBMPs or in background documents. This guidance is not intended to be comprehensive in terms of what the Member States have to include in their

RBMPs or background documents, rather to provide certain concrete elements of information that the European Commission expects to find.

- Analysis tools that were used in assessing disproportionate cost.
- Alternative financing options considered to overcome disproportionate cost and reasons for any options not taken further.
- Whether the costs of basic measures have been excluded from the assessment of disproportionate cost.
- The definition of technical infeasibility.
- The elements considered when determining that natural conditions require an exemption under Articles 4(4) and 4(5).
- If Article 4(6) is applied:
    - Description of the conditions under which circumstances that are exceptional or that could not reasonably have been foreseen may be declared, including the indicators used.
    - Description of the instances where Article 4(6) has been applied, the reasons, the levels of the indicators which make the circumstances exceptional, the groundwater bodies affected and the extent of impacts, the measures taken to restore groundwater bodies affected, and the effects of such measures.
- For each application of Article 4(7), justification and explanation of the reasons for the project and the fulfilment of the conditions under Article 4(7), including:
    - Details on how the project has been assessed for deterioration of the status or failure to achieve WFD environmental objectives, based on a QE level.
    - How the assessment of cumulative effects has been considered in the application of Article 4(7).
    - The mitigation measures that are in place in relation to the application of Article 4(7).
    - The methodology for assessing over-riding public interest in the application of Article 4(7).
    - The methodology for assessing the benefits in the application of Article 4(7).
    - Details of the better environmental options that have been considered in the application of Article 4(7).
- The methodology used for determining exemptions under Article 6(3) of the Groundwater Directive.

- Details of transboundary co-ordination that has taken place in the application of exemptions.

Drivers and impacts behind exemptions

- Include the following table in the RBMP or background document on the drivers and impacts behind exemptions to good status. The cells should contain the number of groundwater bodies in which an exemption of any kind is applied relevant to each driver and impact. Groundwater bodies may be exempted due to more than one combination of drivers and impacts and, therefore, the reported values when summed are not expected to equate to the total number of exempted groundwater bodies.

Impact / Driver	Agri-culture	Climate change	Energy hydro-power	Energy non-hydro-power	Fisheries and aqua-culture	Flood protection	Forestry	Industry	Tourism and recreation	Transport	Urban developmen t	Unknown / Other
N pollution												
P pollution												
Organic pollution												
Chemical pollution												
Saline pollution												
Acidification												
Elevated temperatures												
Altered habitats due to hydrological changes												
Altered habitats due to morphological changes												
Microbiological pollution												
Other significant impacts												

There will be cases where data and information are not available to produce this kind of table. This may be particularly the case for certain pressures which are more difficult to quantify and/or in complex RBD subject to many pressures, where it is difficult to disaggregate the pressure-measure relationships.

On this basis, the Member States are requested to report data and information to the best extent possible and for the pressures where this information is available or can be derived on the basis of reasonable efforts. In this regard, lack of reporting of this information does not imply a failure to comply with the WFD obligations.

9. Reporting at RBD/Sub-unit level for RBMP (schema RBMPPoM)

9.1. Overview of reporting of information on RBMP

Reporting of information on RBMP and Programme of Measures (PoM) is done for each RBD or Sub-unit. For the purpose of presentation in this guidance, the contents of reporting are structured according to the following Chapters:

- General information on RBMP dates, adoption, table of contents, more detailed programmes and links to other policies (section 9.2)

- Information on emissions of pollutants to surface and groundwater, including the inventory of emissions, discharges and losses of priority substances (section 9.3)
- Information on water abstraction and exploitation of water resources (section 9.4)
- Information on the Programme of measures (chapter 10)
- Information on economic analysis and cost recovery (chapter 11)

The following sections describe the contents of reporting. The UML diagram of the RBMPPoM schema is found in Annex 10.7.

9.2. RBMP dates, table of contents, more detailed programmes, justifications, public participation

9.2.1. Introduction

The River Basin Management Plan (RBMP) is the main tool for the water management of all surface and groundwater bodies within a specified RBD and the contents of the RBMP are outlined in WFD Annex VII. With respect to water governance, the RBMP shall contain: a general description of the RBD; a summary of the significant pressures and impacts on surface and groundwater bodies; a summary of the measures intended to mitigate the impacts identified; a register of any more detailed plans proposed for sub-basins, sectors, management issues or water categories; a summary of public consultation; and, a list of the Competent Authorities including their relationship with other authorities co-ordinated within a Member State, and a summary of institutional relationships established to ensure co-ordination in international RBDs.

Importantly, the WFD sets Environmental Objectives for Member States to attain for surface and groundwater bodies, the default being 'good status' by 2015 (unless an exemption applies or the surface water body meets the conditions for an Artificial or Heavily Modified Water Body). The RBMP is the key tool by which the process to achieve such legally binding Environmental Objectives can be formally set out as a roadmap to implementation and be subject to review.

The WFD sets out a stepwise approach for the development of the RBMP, and if one requirement is not complete or correctly carried out, it may pose obstacles for subsequent steps in the implementation process.

A clear and complete RBMP is also important for accountability as it is also the main tool for communicating to interested parties, including the public, how integrated water management is, or will be, carried out. Complete draft RBMPs including, as appropriate, draft background documents, should be made available in a timely manner through the public consultation process, in order to ensure that interested parties are given sufficient information to enable them to express their views in a meaningful way.

9.2.2. How will the European Commission and the EEA use the information reported?

The European Commission will use the information reported to ensure that the Member State has properly implemented the WFD, that a register of more detailed programmes and management

plans is in place (see CIS Guidance Document No. 8[102]), and that information has been provided to the public in accordance with the WFD.

In addition, the European Commission will use the information to develop future water policy instruments.

Statistics and information will be provided to the European Parliament at EU level. Information will be provided to the public through WISE.

9.2.2.1. Products from reporting

In general, statistics can be derived of the main methodological approaches and factual information reported.

9.2.3. Contents of the 2016 reporting

9.2.3.1. Schema sketch

See Annex 10.7.

9.2.3.2. Information and data to be reported using the schemas

Schema: RBMPPoM
Class RBMP *Properties: maxOccurs = 1 minOccurs =1*
Schema element: rbmpName Field type / facets: String1000Type Properties: maxOccurs =1 minOccurs = 1 Guidance on completion of schema element: Required. Name of the RBMP in English.
Schema element: rbmpTimetablePublicationDate Field type / facets: DateType Properties: maxOccurs =1 minOccurs = 1 Guidance on completion of schema element: Required. Date of publication of the timetable for the production of the RBMP, in the format YYYY-MM-DD.
Schema element: rbmpProgrammePublicationDate Field type / facets: DateType Properties: maxOccurs =1 minOccurs = 1 Guidance on completion of schema element: Required. Date of publication of the work programme

[102] https://circabc.europa.eu/sd/a/0fc804ff-5fe6-4874-8e0d-de3e47637a63/Guidance%20No%208%20-%20Public%20participation%20(WG%202.9).pdf

for the production of the RBMP, in the format YYYY-MM-DD.
Schema element: rbmpConsultationPublicationDate **Field type / facets:** DateType **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Date of publication of the consultation measures for the production of the RBMP, in the format YYYY-MM-DD.
Schema element: rbmpInterimOverviewDate **Field type / facets:** DateType **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Date of publication of the interim overview of the Significant Water Management Issues, in the format YYYY-MM-DD.
Schema element: rbmpDraftVersionDate **Field type / facets:** DateType **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Date of publication of the draft versions of the RBMP, in the format YYYY-MM-DD.
Schema element: finalRBMPPublicationDate **Field type / facets:** DateType **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Date of publication of the final RBMP, in the format YYYY-MM-DD.
Schema element: subPlans **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether there are specific sub-plans as mentioned in Article 13.5 of the WFD.
Schema element: subPlansCoverage **Field type / facets:** SubPlansCoverage_Enum: Agriculture Chemical industry Hydropower Transport Water Scarcity and droughts Climate change Coastal erosion

Rural planning Urban planning Nutrient enrichment Chemical pollution Other **Properties:** maxOccurs =unbounded minOccurs = 0 **Guidance on completion of schema element**: Conditional. If there are specific sub-plans, select the issues they address from the enumeration list. If 'Other' is selected, specify the issue(s) addressed in subPlansCoverageOther. **Quality checks**: Conditional check: Report if subPlans is 'Yes'.
Schema element: subPlansCoverageOther **Field type / facets:** String1000Type **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. If 'Other' is selected from the enumeration list under subPlansCoverage, list the issue(s) addressed. **Quality checks**: Conditional check: Report if subPlans is 'Yes' and subPlansCoverage is 'Other'.
Schema element: subPlansReference **Field type / facets:** ReferenceType (see Annex 9) **Properties:** maxOccurs =unbounded minOccurs = 0 **Guidance on completion of schema element:** Conditional. Provide references or hyperlinks to the documents and sections where relevant information relating to the sub-plans can be found. Links to the sub-plans themselves can be provided. **Quality checks:** Conditional check: Report if subPlans is 'Yes'.
Schema element: sea **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether Strategic Environmental Assessments (SEA) have been undertaken on the RBMP and PoM.
Schema element: seaReference **Field type / facets:** ReferenceType (see Annex 9) **Properties:** maxOccurs =unbounded minOccurs = 0 **Guidance on completion of schema element:** Conditional. Provide references or hyperlinks to the SEA documents. **Quality checks:** Conditional check: Report if sea is 'Yes'.
Schema element: publicConsultationInformation

Field type / facets: PublicConsultationInformation_Enum:

Media (papers, TV, radio)

Internet

Social networking (Twitter, Facebook etc)

Printed material

Direct mailing

Invitations to stakeholders

Local Authorities

Meetings

Written consultation

Other

Properties: maxOccurs =unbounded minOccurs = 1

Guidance on completion of schema element: Required. Select the mechanism(s) used for informing the public and interested parties about the consultations on the draft RBMP from the enumeration list. More than one mechanism may be selected. If 'Other' is selected, specify the tool(s) used in publicConsultationInformationOther.

Schema element: publicConsultationInformationOther

Field type / facets: String1000Type

Properties: maxOccurs =1 minOccurs = 0

Guidance on completion of schema element: Conditional. If 'Other' is selected from the enumeration list under publicConsultationInformation, list the mechanism(s) used.

Quality checks: Conditional check: Report if publicConsultationInformation is 'Other'.

Schema element: rbmpConsultation

Field type / facets: RBMPConsultation_Enum:

Via internet

Via Twitter

Via Facebook

Via other social networking

Direct invitation

Exhibitions

Other outreach methods (e.g. game shows, board games, web-based material for schools)

Telephone surveys

Other

Direct involvement in drafting RBMP

Properties: maxOccurs =unbounded minOccurs = 1

Guidance on completion of schema element: Required. Select the tool(s) used to carry out the public consultation on the draft RBMP from the enumeration list. More than one tool may be selected. If 'Other' is selected, specify the tool(s) used in rbmpConsultationOther.
Schema element: rbmpConsultationOther **Field type / facets:** String1000Type **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. If 'Other' is selected from the enumeration list under rbmpConsultation, list the tool(s) used. **Quality checks**: Conditional check: Report if rbmpConsultation is 'Other'.
Schema element: documentProvision **Field type / facets:** DocumentProvision_Enum: Downloadable Direct mailing (e-mail) Direct mailing (post) Paper copies distributed at exhibitions Paper copies available in municipal buildings (town hall, library etc) Other **Properties:** maxOccurs =unbounded minOccurs = 1 **Guidance on completion of schema element**: Required. Select the method(s) used to provide the public and interested parties with the consultation documents (e.g. draft RBMPs and background documents) from the enumeration list. More than one method may be selected. If 'Other' is selected, specify the method(s) used in documentProvisionOther.
Schema element: documentProvisionOther **Field type / facets:** String1000Type **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. If 'Other' is selected from the enumeration list under documentProvision, list the method(s) used. **Quality checks**: Quality checks: Conditional check: Report if documentProvision is 'Other'.
Schema element: documentAvailability **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether the consultation documents (e.g. draft RBMPs and background documents) were made available for 6 months for feedback.
Schema element: ongoingStakeholderInvolvement **Field type / facets:** OngoingStakeholderInvolvement_Enum:

Regular exhibitions Establishment of advisory groups Involvement in drafting Other outreach activities Formation of alliances Other **Properties:** maxOccurs =unbounded minOccurs = 1 **Guidance on completion of schema element**: Required. Select the tools(s) used to achieve the continued active participation of stakeholders in the implementation of the WFD from the enumeration list. More than one tool may be selected. If 'Other outreach activities' is selected, specify the outreach activities(s) used in ongoingStakeholderInvolvementOtherOutreach. If 'Other' is selected, specify the method(s) used in ongoingStakeholderInvolvementOther.
Schema element: ongoingStakeholderInvolvementOtherOutreach **Field type / facets:** String1000Type **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. If 'Other outreach activities' is selected from the enumeration list under ongoingStakeholderInvolvement, list the outreach activities(s) used. **Quality checks**: Conditional check: Report if ongoingStakeholderInvolvement is 'Other outreach activities'.
Schema element: ongoingStakeholderInvolvementOther **Field type / facets:** String1000Type **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. If 'Other' is selected from the enumeration list under ongoingStakeholderInvolvement, list the tool(s) used. **Quality checks**: Conditional check: Report if ongoingStakeholderInvolvement is 'Other'.
Schema element: stakeholderGroups **Field type / facets:** StakeholderGroups_Enum: Water supply and sanitation Agriculture / farmers Energy / hydropower Navigation / ports Fisheries / aquaculture Industry NGOs / nature protection Consumer groups

Local / regional authorities Other **Properties**: maxOccurs =unbounded minOccurs = 1 **Guidance on completion of schema**: Required. Select the stakeholder groups that have been actively involved in the development of the RBMPs from the enumeration list. More than one stakeholder group may be selected. If 'Other' is selected, specify the stakeholder group(s) in stakeholderGroupsOther.
Schema element: stakeholderGroupsOther **Field type / facets:** String1000Type **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional check: Report if stakeholderGroups is 'Other'. **Quality checks**: Conditional check: Report if stakeholderGroups is 'Other'.
Schema element: impactPublicParticipation **Field type / facets:** ImpactPublicParticipation_Enum: Changes to selection of measures Adjustment to specific measures Addition of new information Changes to the methodology used Commitment to further research Commitment to action in the next RBMP cycle Other **Properties:** maxOccurs =unbounded minOccurs = 1 **Guidance on completion of schema element**: Required. Select the impact(s) of the public participation process on the RBMPs from the enumeration list. This refers to the whole RBMP process, not just the 6 month consultation on the draft plan. More than one impact may be selected. If 'Other' is selected, specify the impact(s) in impactPublicParticipationOther.
Schema element: impactPublicParticipationOther **Field type / facets:** String1000Type **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. If 'Other' is selected from the enumeration list under impactPublicParticipation, list the impact(s). **Quality checks**: Conditional check: Report if impactPublicParticipation is 'Other'.
Schema element: internationalCoOrdination **Field type / facets:** InternationalCoOrdination_Enum: Category 1: International agreement, permanent co-operation body and international RBMP in

place.

Category 2: International agreement and permanent co-operation body in place.

Category 3: International agreement in place.

Category 4: No co-operation formalised.

Properties: maxOccurs =1 minOccurs = 0

Guidance: Conditional. If the RBD is international, select the type of international co-operation or co-ordination mechanism(s) that exist between neighbouring Member States from the enumeration list.

Coordination categories as developed under the project EC Comparative study of pressures and measures in the major river basin management plans in the EU, Water Governance report[103].

Quality checks: Conditional check: Report if pominternationalRBD is 'Yes'.

Schema element: internationalCoOrdinationPublicParticipation

Field type / facets: YesNoCode_Enum: Yes, No

Properties: maxOccurs =1 minOccurs = 0

Guidance on completion of schema element: Conditional. If the RBD is international, indicate whether there has been international co-ordination on public participation and the active involvement of interested parties.

Quality checks: Conditional check: Report if pominternationalRBD is 'Yes'.

Schema element: publicParticipationReference

Field type / facets: ReferenceType (see Annex 9)

Properties: maxOccurs =unbounded minOccurs = 1

Guidance on completion of schema element: Required. Provide references or hyperlinks to the documents and sections where relevant information relating to public participation and its effectiveness can be found including information on international coordination if any.

Schema element: consultationResponsesReference

Field type / facets: ReferenceType (see Annex 9)

Properties: maxOccurs =unbounded minOccurs = 1

Guidance on completion of schema element: Required. Provide references or hyperlinks to the documents and sections where relevant information on the RBMP public consultation responses can be found.

Schema element: integrationFloodsDirective

Field type / facets: YesNoCode_Enum: Yes, No

Properties: maxOccurs =1 minOccurs = 1

Guidance on completion of schema element: Required. Indicate whether RBMPs and Floods

[103] http://ec.europa.eu/environment/archives/water/implrep2007/background.htm.

Directive Flood Risk Management Plans have been integrated into a single plan.
Schema element: coOrdinationFloodsDirective **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether joint consultation was carried out on the RBMPs and Flood Risk Management Plans.
Schema element: fdCoordinationReference **Field type / facets:** ReferenceType (see Annex 9) **Properties:** maxOccurs =unbounded minOccurs = 1 **Guidance on completion of schema element:** Required. Provide references or hyperlinks to the documents and sections where relevant information on the coordination of the RBMP with the Floods Directive implementation can be found.
Schema element: coOrdinationMSFD **Field type / facets:** YesNoCode_Enum: Yes. No **Properties:** maxOccurs =1 minOccurs = 1 **Guidance**: Required. Indicate whether joint consultation was carried out on the RBMPs and Marine Strategy.
Schema element: msfdCoordinationReference **Field type / facets:** ReferenceType (see Annex 9) **Properties:** maxOccurs =unbounded minOccurs = 1 **Guidance on completion of schema element:** Required. Provide references or hyperlinks to the documents and sections where relevant information on the coordination of the RBMP with the Marine Strategy Framework Directive implementation can be found.

9.3. Inputs of pollutants to surface waters (and groundwaters), including inventories of emissions, discharges and losses of EQSD Annex I substances

9.3.1. Introduction

Article 5 of the EQSD (2008/105/EC)[104] requires Member States to establish, on the basis of the information collected in accordance with Articles 5 and 8 of the WFD and other available data such as that collected under Regulation (EC) No 166/2006[105], an inventory of emissions, discharges and losses of all Priority Substances and the eight other pollutants listed in Part A of Annex I EQSD for

[104] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:348:0084:0097:en:PDF

[105] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:033:0001:0017:EN:PDF

each RBD, or part thereof, lying within their territory. The CIS Guidance Document No. 28[106] addresses the preparation of the inventories at national RBD scale.

Article 5 of the WFD requires Member States to identify the significant anthropogenic pressures in the RBD likely to cause individual surface and groundwater bodies to be of less than good status (or to be at risk of deterioration). This is the so-called 'pressures and impacts analysis'. According to Annex II, 1.4 WFD, as part of the identification of pressures, Member States are required to estimate and identify significant point and diffuse source pollution.

Article 5(5) of the EQSD requires the European Commission to verify by 2018 that emissions, discharges and losses, as reflected in the inventory of substances given in Annex I of the EQSD, are making progress towards compliance with the reduction or cessation objectives in the WFD, i.e. that there is a downward trend. The reference period for the estimation of pollutant values in the inventory should be one year (or period) between 2008 and 2010. The inventory should be updated between each RBMP. As the first inventory is expected with the RBMPs published in 2015, the next update cannot officially be expected until 2021. Therefore, the analysis of progress by 2018 will have to rely on the voluntary reporting in the 2015 RBMP of inputs of EQSD Annex I substances at two points in time, or over two periods, one covering the reference year or period and the other a more recent year or period. A reliable trend can only be determined if the basis for the calculation of inputs is the same for each year or period, or a correction is made for additional coverage. In some cases, Member States may only be able to provide data for a year or period more recent than 2008-2010, and are, therefore, unable to determine a trend.

Article 5 WFD requires that Member States carry out a similar analysis of pressures for other substances and parameters, i.e. nutrients, deoxygenating substances (COD, BOD), saline discharges, and RBSPs that are discharged in significant quantities to surface and groundwater bodies in each RBD.

Figure 2 on page 16 of the CIS Guidance Document No 28 on inventories[107], which is reproduced here (Figure 5), illustrates the main routes of pollutant transport into surface waters. It indicates source and pathway apportionment for inputs to surface waters, including via upstream compartments. The annotations a) to m) and P1-P3 in the figure allow each of the source and pathway categories to be referred to when pollution by a chemical substance has been quantified.

The combined term 'emissions, discharges and losses' refers to the Esbjerg Declaration of the North Sea Convention combining all categories of inputs of chemical substances to surface water, in this context called 'inputs'[108]. 'Losses' does not refer to any retention or degradation within soil, groundwater or surface water.

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[106] https://circabc.europa.eu/sd/a/6a3fb5a0-4dec-4fde-a69d-5ac93dfbbadd/Guidance%20document%20n28.pdf

[107] https://circabc.europa.eu/sd/a/6a3fb5a0-4dec-4fde-a69d-5ac93dfbbadd/Guidance%20document%20n28.pdf

[108] Input = Movement of a substance into the aquatic environment, i.e. sum of emissions, discharges and losses (inputs) to surface and groundwaters, from land and sea-based sources and from point and diffuse sources, including atmospheric deposition.

Figure 2 of the CIS Guidance Document No 28 (Figure 5) identifies four tiers or approaches to establishing inventories, i.e. point source information, riverine load, pathway oriented and source oriented. A number of case studies are included. The point source information and riverine load approaches are based on monitoring data. Point source information may be limited because permits do not always require monitoring of the concentrations of Priority Substances, and quantification is only required for E-PRTR facilities. If point source information is limited, the use of carefully justified emission factors together with information on the volume discharged may provide a more complete picture at the regional scale required for the inventory.

The riverine load approach is limited by the analytical resolution, and in the case of heavy metals also by the fact that only the dissolved fraction (not the solid phase fraction) may have been quantified. The riverine load approach is considered capable of yielding a rough estimation of total diffuse inputs from a catchment if the point source inputs are known. The guidance recommends cross-checking the outputs of the different approaches using the riverine load as validation information for the more complex methods.

The pathway oriented approach (RPA) involves extensive modelling of transfer processes towards surface waters, and the source-oriented approach takes an even more complex look at the whole system, using, for example, Substance Flow Analysis (SFA). The different approaches provide different results in terms of process information and spatial resolution. So, in general, the RPA provides a better regionalisation of the inputs whereas the SFA provides a more comprehensive view of the actual releases into the environment but is more limited with respect to spatial resolution. The guidance acknowledges the value of source apportionment for identifying control measures.

P1: Atmospheric Deposition directly to Surface Waters	P2: Erosion	P3: Surface Runoff from Unsealed Areas
P4 Interflow, Tile Drainage and Groundwater[109]	P5: Direct Discharges and Drifting	P6: Surface Runoff from Sealed Areas
P7: Storm Water Outlets, Combined Sewer Overflows and Unconnected Sewers	P8: Urban Waste Water Treated	P9: Individual - Treated and Untreated-Household Discharges
P10 Industrial Waste Water treated	P11: Direct Discharges from Mining Areas[110]	P12: Direct Discharges from Navigation[111]
P13 Natural Background		

The encoding a) – m) has been inserted in the figure to enable identification of source categories in relation to their pathways P1-P13.

Figure 5 - Figure 2 from CIS Guidance No 28: General working scheme of the inventory

Guidance Document 28 suggests a two-step approach in compiling the inventory. In the first step substances not relevant in the RBD should be identified based on the information from the WFD Article 5 analysis. For those substances, only a basic estimation of significant inputs should

[109] pathway comprises also emissions from contaminated land

[110] A portion of the total emissions from abandoned and historic mining sites is discharged to groundwater. Active mines are covered under "Industry".

[111] Inland navigation also comprises waterway construction materials.

optionally be reported whereas for the remaining substances a more in-depth analysis should be performed, as a minimum based on the riverine load approach and point source inputs.

For the first inventories, the minimum expectation from the more in-depth assessment is the quantification of total point source inputs and total diffuse source inputs. However, due to data gaps and the analytical uncertainty mentioned above, this may not be possible in all cases. For the evaluation of data reliability, information on the methods used is required.

More detailed reporting of information on source (or pathway) apportionment would add substantially to the value of the exercise, and is provided for in the schema elements on an optional basis. Voluntary reporting of total point source inputs, total diffuse source inputs, and individual sources of RBSPs or other pollutants is also provided for.

Since 2009, the EEA has been collecting data on pollutant loads through the State of the Environment (SoE) reporting by EEA Member Countries involved the EIONET process on an annual basis (see reporting obligation for Water emission (WISE-1))[112]. The source categories for apportioning inputs are similar in some respects to the inputs P1-P13 identified in Figure 2 of the CIS Guidance Document No 28, and in that respect they provide an adequate indication of the apportionment.

Other Member States may have used the WFD list of pressure types (in Annex 1a to this document), which may also provide an adequate indication.

It is possible to roughly correlate the SoE source categories and WFD pressure types with the pathways identified in the inventory guidance. An indication of how the various categorisations can be correlated is provided in Annex 7. Depending upon the data provided by Member States, i.e. on the categorisation used, the European Commission may use these correlations to analyse and compare the source apportionment in different Member States. Discussion and further follow-up work in the EIONET framework could lead to greater harmonisation of the categorisation.

It would not be appropriate to limit reporting to inputs *known* to be causing EQS failures. This is because one purpose of the WFD Article 5 analysis is to identify where to monitor substances, therefore concentrations and EQS failures might not yet have been determined, and because, at least for Priority Hazardous Substances, any knowledge of quantifiable inputs should be considered relevant and included in the inventory.

9.3.2. How will the European Commission and the EEA use the information reported?

As required by the WFD, the inventories will be used by the European Commission for compliance checking with the Environmental Objectives of the WFD (Article 4) on the reduction of emissions, discharges and losses (inputs) of Priority Substances and cessation or phase-out of inputs of Priority Hazardous Substances, and of the eight other pollutants included in EQSD Annex I.

The inventories will be an important element of the European Commission's review according to Article 7(1) of the EQSD on the possible need to amend existing acts or introduce additional specific

[112] http://rod.eionet.europa.eu/obligations/632

Community-wide measures such as emission controls, as well as to the report according to Article 7(2).

The information should throw light on the relevance of pollutants, including Priority Substances, at the spatial scale of the RBD or the national part of an international RBD, and on the loads reaching the aquatic environment, thus supporting Member States in subsequent river basin management and WFD implementation. However, it is recognised that differences in methodologies used will mean that comparison between the datasets from different Member States will be subject to caveats, and work will be needed to improve comparability. In addition, since the basis for the emission inventory in each Member State could change, proper comparison to determine a trend might require recalculation of the data for an earlier reference year or period, and this might not always be possible. For the public, the information should provide greater transparency regarding the possible origin of existing problems and the need for measures to address those problems.

It should be possible to illustrate trends in inputs for substances other than the EQSD Annex I substances, as has been done already for nitrogen and phosphorus, and to relate reductions to measures.

Information on source/pathway apportionment will be used to provide European overviews of the contribution made by different sources and pathways to the loads of pollutants.

Statistics and information will be provided to the European Parliament at EU level. Information will be provided to the public through WISE.

9.3.2.1. Products from reporting

The following charts, tables and/or maps will be developed. The extent to which products relating to non-EQSD substances can be developed will depend upon the extent of reporting. The extent to which products relating to trends can be produced will depend upon the provision of data for more than one year. The products will focus on total inputs to surface waters and groundwaters, but some could distinguish between inputs specifically to surface waters and inputs to groundwaters if sufficient information is provided. Similarly, products presenting inputs from individual sources might be produced if sufficient source or pathway apportionment data are reported.

Nb	Name of product	Type of product	Scale of information*	Detailed information displayed	Source of detailed information and aggregation rule
1	Total (significant) point source inputs of EQSD Annex I substances	Chart, table or map	EU/MS/RBD	Inputs from point source categories by substance.	Information reported at RBD or Sub-unit level.
2	Total (significant) diffuse source inputs of EQSD Annex I substances	Chart, table or map	EU/MS/RBD	Inputs from diffuse source categories by substance.	Information reported at RBD or Sub-unit level.
3	Trends in total inputs of EQSD Annex I substances	Chart or table	EU/MS/RBD	Trend in total point and diffuse source inputs (including by self-assessment if provided), by substance.	Information reported at RBD or Sub-unit level.
4	Total (significant)	Chart, table	EU/MS/RBD	Inputs from point source	Information reported at

	point source inputs of other substance s/ parameters	or map		categories, by substance.	RBD or Sub-unit level.
5	Total (significant) diffuse source inputs of other substances / parameters	Chart, table or map	EU/MS/RBD	Inputs from diffuse source categories, by substance.	Information reported at RBD or Sub-unit level.
6	Trends in total inputs of other substances / parameters	Chart or table	EU/MS/RBD	Trend in total point and diffuse source inputs (including by self-assessment if provided), by substance.	Information reported at RBD or Sub-unit level.

9.3.3. Contents of 2016 reporting

The schema elements address the minimum requirement to report total point and total diffuse source inputs of the EQSD Annex I substances, by substance, for at least one year. Similar reporting for other substances/parameters is optional.

The reporting of a second, more recent, year of data, and of a self-assessed trend (taking into account difference in the coverage of actual inputs between the two time points), is optional.

Schema elements on methodology and on data quality are included to enable better assessment of the data.

More detailed reporting of information on source or pathway apportionment (categorisation) for all substances is also optional. Member States may select the system they have used to categorise inputs. If Member States are reporting under the SoE process, they may specify that a particular year of data be taken into account for source apportionment.

Depending upon the level of detail reported, and the approach used to establish the inventory, it is possible to report inputs to surface water specifically via groundwater.

9.3.3.1.Schema sketch

See Annex 10.7.

9.3.3.2.Information and data to be reported

Schema: RBMPPoM (continued)
Class InputInventory *Properties: maxOccurs = unbounded minOccurs = 1*
Schema element: euSubUnitCode Field type / facets: FeatureUniqueEUCodeType Properties: maxOccurs =1 minOccurs = 0 Guidance on completion of schema element: Conditional. If applicable, report the unique EU code of the Sub-unit. If there are no sub-units this element does not need to be reported and the reporting

of the information is done at RBD level. **Quality checks**: Conditional check: report if *RBDSUCA/RBD/*subUnitsDefined is 'Yes'. Element check: First 2 characters must be the Member State's 2-alpha character ISO country code. Cross-schema check: euRBDSubUnitCode must be consistent with the codes reported in *RBDSUCA/RBD/SubUnit/*euSubUnitCode.
Schema element: inputInventoryReference **Field type / facets:** ReferenceType (see Annex 9) **Properties:** maxOccurs =unbounded minOccurs = 1 **Guidance on completion of schema element:** Required. Provide references or hyperlinks to the documents and sections where any other relevant information relating to the estimation of the inputs of pollutants can be found. Guidance on what should be included in this document is provided in Section 9.3.3.3.

The following class (child of InputInventory) is used to report information for each substance::

Schema RBMPPoM (continued)
Class InputPollutant *Properties: maxOccurs = unbounded minOccurs = 1*
Schema element: chemicalSubstance **Field type / facets:** ChemicalSubstances_Union_Enum (see Annex 8e) **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Select each EQSD Annex I substance in turn to provide the information detailed in the following schema elements. Select among the RBSP list and other entries additional substances to report the information in the following schema elements. Codes should be consistent with EIONET codes for the same substances. **Quality check**: Within-schema check: all EQSD Annex 1 substances should be reported (if Total aldrin+dieldrin+endrin+isodrin is reported the individual substances do not need to be reported; if Total PAHs is reported, the individual substances Benzo(g,h,i)perylene, Indeno(1,2,3-cd)pyrene, Benzo(b)fluoranthene, Fluoranthene and Benzo(k)fluoranthene do not need to be reported).
Schema element: chemicalSubstanceOther **Field type / facets**: string250Type **Properties**: maxOccurs = 1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. If 'chemicalSubstance' is 'EEA_00-00-0 Other chemical parameter' please indicate in this field the CAS number (if relevant) and the name of the pollutant or indicator. **Quality check**: Conditional check: report if 'chemicalSubstance' is 'EEA_00-00-0 Other chemical

parameter'.
Schema element: inventory **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate if an inventory of emissions, discharges and losses has been completed for this substance. Reply 'No' only if you have not done the necessary assessment for the substance. In case the result of the assessment is that the substance is not relevant at RBD scale report 'Yes' and then report the elements twoStepApproach and relevanceRBDScale accordingly.
Schema element: reportedUnderSoEEmissions **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate if the Member State has reported emissions for this chemical under SoE.
Schema element: twoStepApproach **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. Has the two-step approach in CIS-Guidance No 28 been followed? Step 1 requires an assessment of the current relevance of the substance at the RBD level. Step 2 requires a more detailed analysis for the substances which pass the relevance criteria given in Step 1 (i.e. they are relevant at the RBD level). For those substances that are of minor relevance at the RBD scale (i.e. do not meet Step 1 criteria), MS should try to provide a basic estimation of emissions, discharges and losses from point and diffuse sources: this is particularly important for Priority Hazardous Substances. Together with Schema element relevanceRBDScale this element determines the data-set to be reported for each substance. **Quality checks**: Conditional check: report if inventory is 'Yes'.
Schema element: relevanceRBDScale **Field type / facets:** YesNoNotApplicable _Enum: Yes, No, Not applicable **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. To be answered for reported substances. "Yes" if proceeding to second step of two-step approach. (See criteria on pages 9-10 of the CIS-Guidance No 28.) "No" leads to optional point source assessment. Any knowledge of quantifiable inputs of priority hazardous substances should be reported. "Not applicable" if the Two Step Approach has not been used. **Quality checks**: Conditional check: report if inventory is 'Yes'. Within-schema check: if twoStepApproach is 'No' then relevanceRBDScale must be 'Not applicable'
Schema element: inventoryMethodology **Field type / facets:** InventoryMethodology_Enum:

Tier 1 (point source information)

Tier 2 (riverine load)

Tier 3 (pathway-oriented)

Tier 4 (source-oriented, e.g. SFA)

Tiers 1 + 2

Tiers 1 + 2 + 3

Tiers 1 + 2 + 4

Tiers 1-4

Other

Properties: maxOccurs =1 minOccurs = 0

Guidance on completion of schema element: Required for all substances reported. Indicates the approach used to determine the reported inputValue (and inputCategoryValue if reported). Further descriptions of Tiers 1-4 in CIS Guidance Document 28. Other methodology to be detailed (see inputMethodReference). May be different for different substances and individual input categories. Tier 1 automatic if "No" re "relevanceRBDScale".

Quality check: Conditional check: report if inventory is 'Yes'.

Schema element: inputDataQuality

Field type / facets: InputDataQuality_Enum:

Very good

Good

Medium

Uncertain

Very uncertain

Properties: maxOccurs =1 minOccurs = 0

Guidance on completion of schema element: Optional. It can be reported if quantitative data for this substance is reported. To reflect the reliability and variance of the data provided, taking into account issues such as the availability of monitoring data, the reliability of emission factors used in calculations, the difficulty of taking account of seasonal influences in areas with high seasonal variation etc. E.g. very good would imply a substantial monitoring basis, very uncertain would imply a very weak or absent monitoring basis (heavy reliance on estimation).

Schema element: inputMethodReference

Field type / facets: ReferenceType (see Annex 9)

Properties: maxOccurs =unbounded minOccurs = 0

Guidance on completion of schema element: Conditional. Required if "Other" methodology is

specified under inventoryMethodology. Desirable if approaches in CIS-Guidance Document 28 have been elaborated or described in an electronic freely accessible version of the national emission inventory for EQSD Annex I substances, in specific documents as part of RBMP reporting, in international seas convention guidance documents or similar. URL-Reference to specific documents.

Quality check: Conditional check; report if inventoryMethodology is 'Other'.

Schema element: inputTotalType

Field type / facets: InputTotalType_Enum:

Total point sources

Total diffuse sources

Total point and diffuse sources

Properties: maxOccurs =1 minOccurs = 0

Guidance on completion of schema element: Conditional. Required for all EQSD Annex I substances reported. Optional for other substances/parameters. Distinction between total point and total diffuse expected for EQSD Annex I substances.

Quality checks: Conditional check: it must be reported only if chemicalSubstance is part of the list of Priority Substances (Annex 8d) and inventory is 'Yes'. For others it is optional.

Schema element: inputTotalValue

Field type / facets: NumberDecimalType

Properties: maxOccurs =1 minOccurs = 0

Guidance on completion of schema element: Conditional. Required for all EQSD Annex I substances reported. Optional for other substances/parameters. Input = emissions, discharges and losses.

Quality checks: Conditional check: it must be reported only if chemicalSubstance is part of the list of Priority Substances (Annex 8d) and inventory is 'Yes'. For others is optional.

Schema element: inputTotalUnit

Field type / facets: UnitOfMeasure_Enum (see Annex 8f)

Properties: maxOccurs =1 minOccurs = 0

Guidance on completion of schema element: Conditional. Required if inputTotalValue is reported.

Quality checks: Conditional check: report if inputTotalValue is reported.

Element check: Only the options 't/a' or 'kg/a' are a valid selection.

Schema element: inputYearPeriod

Field type / facets: InputYearPeriodType

Properties: maxOccurs =1 minOccurs = 0

Guidance on completion of schema element: Conditional. 4-digit number (should ideally be 2008, 2009 or 2010 as reference year) required for EQSD Annex I substances and for other substances for which an inputValue is reported. Calendar year to which the load applies. A period of up to six years within the relevant RBMP period may be indicated by a start and end year, separated by a double

hyphen (yyyy--yyyy). If a Member State optionally wants to report a second inputValue for a second inputYearPeriod it must select twice the same substance under chemicalSubstance. Quality checks: Element check: the value must be between 2000 and 2015. Conditional check: report if inputTotalValue is reported. Within-schema check: if two or more periods are reported for the same substance they should not overlap.
Schema element: inputTrend Field type / facets: NumberDecimalType Properties: maxOccurs =1 minOccurs = 0 Guidance on completion of schema element: Optional. For each chemical substance a trend (positive or negative) can be reported directly (self-assessed), independently of any trend that might be calculated directly from the datasets reported for those years. Unit: % per year (+ or -); average over trend interval reported under InputTrendPeriod.
Schema element: inputTrendPeriod Field type / facets: YearRangeType Properties: maxOccurs =1 minOccurs = 0 Guidance on completion of schema element: Conditional. If inputTrend is reported, report first and last years of trend assessment. Quality checks: Element check: the values must be between 2000 and 2015. Conditional check: report if inputTrend is reported.

The following class (child of InputPollutant) is used to report detailed information of the inventory per input category.

Schema RBMPPoM
Class InputCategory *Properties: maxOccurs = unbounded minOccurs = 0*
Schema element: inputCategoryCode Field type / facets: InputCategory_Union_Enum (see Annex 8n): Properties: maxOccurs =1 minOccurs = 1 Guidance on completion of schema element: Required. Allows apportionment of inputs between different sources/pathways.
Schema element: inputCategoryScheme Field type / facets: InputCategoryScheme_Enum: CIS Inventory Guidance Principal Source

CIS Inventory Guidance Pathways CIS Inventory Guidance Riverine Loads WISE SoE Categories WFD Pressures **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Identifies the type of emmissions apportionement being used.
Schema element: inputCategoryValue **Field type / facets:** NumberDecimalType Properties: maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. The multiplicity of the whole Class InputCategory is 0 to many. If the class is reported, this schema element must be included. Report input by source/pathway for each inputCategory selected.
Schema element: inputCategoryUnit **Field type / facets:** UnitOfMeasure_Enum (see Annex 8f) **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. The multiplicity of the whole Class InputCategory is 0 to many. If the class is reported, this schema element must be included. **Quality checks**: Element check: Only the options ‘t/a’ or 'kg/a' are a valid selection.
Schema element: inputUWWTPCoverage **Field type / facets:** InputUWWTPCoverage_Enum: U100 (≥ 100,000 p.e.) U10 (> 10,000 p.e.) U2 (≥ 2,000 p.e.) All (extrapolation to all treatment plants) **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. If categories for Urban Waste Water Treatment Plants are reported please indicate the coverage. Please note that under WISE SoE specific categories exist for this purpose (U11, U12, U13, U14, U21, U22, U23, U24). **Quality checks**: Conditional check: report if '1.1' from Pressures, 'U' or one of its lower level categories from SoE or 'P8' from CIS Guidance (see Annex 8n).
Schema element: inputIndustryCoverage **Field type / facets:** InputIndustryCoverage_Enum: E-PRTR National business registers

All manufacturing industries **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. If categories for Industrial Waste Water Treatment plants are reported please indicate the coverage. “E-PRTR” means large facilities with releases to water reported in E-PRTR; “national business registers” means including also medium size facilities with emission data in registers; “all manufacturimg industries” means including also small size facilities with direct discharges based on economic activity extrapolations. **Quality checks**: Conditional check: report if "I" from SoE or "P10" from CIS–Guidance (see Annex 8n).
Schema element: riverineLoadMonitoringSite **Field type / facets:** FeatureUniqueEUCodeType **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Optional. If reporting inputCategoryValues as riverine loads, provide the code of the monitoring station used as a basis. **Quality checks**: Cross-schema check: the reported riverineLoadMonitoringSite must be consistent with the codes reported MonitoringSites.

9.3.3.3. Guidance on the contents of RBMPs/background documents

The following provides guidance on the aspects that the European Commission expects to find in the relevant chapters on the inputs of pollutants in the RBMPs or in background documents. This guidance is not intended to be comprehensive in terms of what the Member States have to include in their RBMPs or background documents, rather to provide certain concrete elements of information that the European Commission expects to find.

Member States should include a description of the method for estimating the inputs of pollutants from the different sources/pathways in the RBMPs or background documents, or refer to another document.

References

CIS Guidance Document No. 28: Technical Guidance on the Preparation of an Inventory of Emissions, Discharges and Losses of Priority and Priority Hazardous Substances[113]

EIONET SoE reporting guidance[114]

E-PRTR Diffuse Sources project[115]

[113] https://circabc.europa.eu/sd/a/6a3fb5a0-4dec-4fde-a69d-5ac93dfbbadd/Guidance%20document%20n28.pdf

[114] http://rod.eionet.europa.eu/obligations/632

[115] http://prtr.ec.europa.eu/DiffuseSourcesWater.aspx

LIFE WEISS project[116]

9.3.3.4. Glossary of terms

See CIS Guidance No. 28: Preparation of Priority Substances Emissions Inventory and EIONET SoE reporting guidance.

9.4. Water abstractions and exploitation of water resources

9.4.1. Introduction

Recital 19 of the WFD reads as follows: '*This Directive aims at maintaining and improving the aquatic environment in the Community. This purpose is primarily concerned with the quality of the waters concerned. Control of quantity is an ancillary element in securing good water quality and therefore measures on quantity, serving the objective of ensuring good quality, should also be established*'.

Although the WFD is primarily focused on water quality, the management of water quantity plays a very important role through the objective of good quantitative status for groundwater and the hydromorphological component of good ecological status for surface waters. Ultimately, it is only possible to achieve the WFD Environmental Objectives of good status if sufficient quantity of water is available.

The need to integrate the management of water quality and quantity has been highlighted in several reports at EU level[117]. Different CIS groups and networks have also been established for several years. The current CIS Work Programme includes a CIS Working Group on E-flows and an activity on Water Accounts.

Reporting of the quantitative use of water is highly relevant for the WFD although it is clear that the situation as regards quantitative pressures in the EU is very diverse. Therefore, any reporting linked to this issue has to take into account this diverse situation in order to avoid unnecessary burden for those Member States where water abstraction is not an issue now nor is likely to be one in the future.

Article 5 of the WFD requires Member States to identify the key pressures present in the RBD that are likely to cause water bodies to be of less than good status. It also requires Member States to assess the impacts on water bodies to support the determination of status. This analysis should include water quantity related considerations where relevant.

In scarcity-prone RBDs, water balances are often calculated at RBD level, e.g. as part of water resources management or development of RBMPs and drought management plans. Significant abstractions and volumes abstracted on an annual and/or seasonal temporal scale, by source and

[116] http://weiss.vmm.be/

[117] E.g. in the Communication from the Commission on Water Scarcity and Droughts COM(2007)414, on the Council Conclusions of June 2010 on the same subject and lately on the Blueprint to Safeguard Europe's Water Resources COM(2012)673.

category of abstraction (see List of pressure types in Annex 1a) have frequently been reported in RBMPs in the first cycle at RBD or Sub-unit level.

In 2012, Water Directors agreed a formula for calculating the Water Exploitation Index Plus (WEI+)[118] of a particular area, as 'the total consumption of water divided by the renewable freshwater resources'. The WEI+ was developed by the CIS Expert Group on Water Scarcity and Droughts to provide an indication of the pressure on the water resources of a certain territory as a consequence of water withdrawals.

WEI+ = (Abstractions – Returns) / Renewable Water Resources

This information is highly relevant to reinforce the link between water quantity and water quality, and the interaction between surface and groundwater bodies.

In terms of the pressure analysis, the information generally focuses on water use which needs to be further specified into water abstraction and consumptive water use ('Abstraction minus Returns'). However, the pressures due to consumptive use need to be put into the context of water availability since only an imbalance between consumptively used water and freshwater availability gives an indication of the real pressure on the water ecosystem.

The selection of appropriate spatial and temporal scales is important to specify the regional and seasonal differences in the assessments. For the purpose of reporting the following scales are considered:

Spatial Scale

National.

RBD or the portion of an international RBD falling within a Member State's territory.

Temporal Scale

In some basins, water scarcity is reflected only when calculating the monthly WEI+ indicator but not necessarily the annual WEI+ indicator. It is recognised that the monthly WEI+ best represents seasonal shortages that may not be revealed in the annual scale, while the annual WEI+ may be sufficient where there is an absence of problems associated with water scarcity. However, the application of the WEI+ on a monthly basis and associated reporting requires considerable effort in data acquisition and, therefore, should only be required in those RBDs where water abstraction is a significant pressure.

In order to adapt the reporting effort to the situation in the respective RBDs, the following two-step approach is devised for reporting purposes:

[118] https://circabc.europa.eu/sd/a/b81cb8ec-2655-4013-ac40-d6266ed33523/Update%20on%20Water%20Scarcity%20and%20Droughts%20indicator%20development%20May%202012.doc

- Required for all RBDs: an indication of whether, on the basis of the pressures and impacts analysis, the annual WEI+ and/or any other available information, the Member State considers that water abstraction (understood as net consumption) is a significant pressure at the level of the (national part of the) RBD (or significant portions of it). If water abstraction is not a significant pressure in the RBD, *no* further reporting is required. An estimate of the RBD or national annual WEI+ may be provided if available (optional).

- Required only for those RBDs where water abstraction is considered a significant pressure: report the annual WEI+ and the WEI+ for the worst month in which water scarcity situations could be expected in the (national part of the) RBD as well as supplementary information about the consumptive water use by source and sector, and supporting parameters.

  Reporting of the WEI+ for the worst month is not required in those cases where water scarcity does not present a seasonal pattern.

An alternative reporting option is provided for those Member States where the WEI+ is not yet available and uses other indicators.

Regarding the reporting of consumptive use, it is recognised that Member States have different approaches to obtain this value from their statistics. Focus needs to be on the clarification of the share of consumptive use as this is the most relevant aspect relating to water scarcity and droughts. In addition, it should be ensured that volumes that are abstracted but returned (e.g. for cooling water and hydropower) are not included into the reported value. Estimates for the consumptive use of water can be made on the basis of percentage factors of abstraction per type of use.

If the information requested has already been reported to the EEA's SoE reporting through the EIONET process, it does not need to be reported again under the WFD.

9.4.2. How will the European Commission and the EEA use the information reported?

Information provided by Member States on the WEI+ and, where appropriate, the water abstracted by sector from surface waters or groundwater will be used to provide European overviews of water quantity related challenges.

Statistics and information will be provided to the European Parliament at EU level. Information will be provided to the public through WISE.

9.4.2.1. Products from reporting

The products below will focus on those RBDs and Member States where water abstraction is a pressure. For the remaining RBDs and Member States, an indication will be displayed to state that water abstraction has not been identified as a problem.

Thresholds have not yet been agreed[119]. Until this is done, the presentation of the products should be for comparison purposes only and should not include any classification unless previously agreed

[119] See conclusions from Informal Meeting of Water and Marine Directors of the European Union, Candidate and EFTA Countries Copenhagen, 4-5 June 2012

by Member States. The products from reporting will need approval through the CIS process whenever EU-wide visualisation is involved.

Nb	Name of product	Type of product	Scale of information*	Detailed information displayed	Source of detailed information and aggregation rule
1	WEI+ national	Chart, table or map	EU/MS	Indication of the pressure on the water resources at national level as a consequence of water withdrawals.	Information reported at national level for a 5 year period.
2	WEI+ seasonal for worst month in the year or period	Chart, table or map	RBD	Indication of the pressure on the water resources at national level as a consequence of water withdrawals, based on the worst month in the year or period reported.	Information reported at RBD level.
3	Water abstraction by source	Chart, table or map	EU/MS/RBD	Share of abstraction between surface and groundwater resources.	Information reported at RBD or Sub-unit level, at annual or monthly resolution.
4	Trends in water use by sector	Chart, table or map	EU/MS/RBD	Trends in water use by sector. Identification of the main water users across Europe.	Information reported at RBD level.
5	Overview of losses and leakages	Chart, table or map	EU/MS/RBD	Overview of loss and leakages and trends of their improvements.	Information reported at RBD level.
6	Water transfers, returns and reuse	Chart, table or map	EU/MS/RBD	Overview of returned waters, amounts reused and intra and inter-basin transports in and out of the RBD (e.g. to big cities)	Information reported at RBD level.
7	Water exploitation and Water balance and their trends	Chart, table or map	EU/MS/RBD	Water balance information displayed as index.	Information reported at RBD level for a 5 year period.

9.4.3. Contents of 2016 reporting

9.4.3.1.Schema sketch

See Annex 10.7.

9.4.3.2. Data and information to be reported using the schemas

Schema: RBMPPoM (continued)
Class WaterQuantity *Properties: maxOccurs = 1 minOccurs = 1*
Schema element: wqPressure Field type / facets: YesNoCode_Enum: Yes, No Properties: maxOccurs =1 minOccurs = 1 Guidance on completion of schema element: Required. Indicate whether water abstraction (understood as consumptive use or net consumption) has been identified as a significant pressure at

the RBD level (or in significant portions of the RBD).
Schema element: reportedUnderSoEQuantity **Field type / facets / relationship**: YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether information on water abstraction (understood as consumptive use or net consumption) has previously been reported to SoE-Water Quantity. If 'Yes' is reported, there is no need to provide any further information regarding WEI+.
Schema element: weiNational **Field type / facets:** NumberDecimal0100Type **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Optional. Report the annual water exploitation index (WEI+) as a percentage at national level for the latest available reference year or as an average of the latest available 5 year period.
Schema element: weiNationalYear **Field type / facets:** YearRangeType **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. Report the latest available reference year (in the format YYYY) or 5 year period (in the format YYYY--YYYY) used in the calculation of the annual WEI+ at national level as reported in weiNational. **Quality checks**: Element check: must be reported in the format YYYY (for a single year) or YYYY--YYYY (for a period). Conditional check: report if weiNational is reported.
Schema element: weiRBD **Field type / facets:** NumberDecimal0100Type **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. If water abstraction has been identified as a significant pressure at RBD level, report the annual WEI+ as a percentage at RBD level for the latest available reference year or as an average of the latest available 5 year period. If it is not possible to report the value of weiRBD report '0' and report an alternative indicator under wqAlternativeIndicatorReference below. **Quality checks**: Conditional check: Report if wqPressure is 'Yes' and reportedUnderSoEQuantity is 'No'.
Schema element: weiRBDYear **Field type / facets:** YearRangeType **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. If water abstraction has been identified as a significant pressure at the RBD level, report the latest reference year (in the format YYYY) or 5 year

period (in the format YYYY--YYYY) used in the calculation of the annual WEI+ at RBD level as reported in weiRBD.

Quality checks: Element check: must be reported in the format YYYY (for a single year) or YYYY--YYYY (for a period).

Conditional check: Report if wqPressure is 'Yes', reportedUnderSoEQuantity is 'No' and weiRBD is not null.

Schema element: weiWorst

Field type / facets: NumberDecimal0100Type

Properties: maxOccurs =1 minOccurs = 0

Guidance on completion of schema element: Conditional. If water abstraction has been identified as a significant pressure at the RBD level, report the WEI+ for the worst month as a percentage at RBD level. Reporting of the WEI+ for the worst month is not required in those cases where water scarcity does not exhibit a seasonal pattern. In those cases report '0'.

Quality checks: Conditional check: Report if wqPressure is 'Yes' and reportedUnderSoEQuantity is 'No'.

Schema element: weiWorstMonth

Field type / facets: YearMonthType

Properties: maxOccurs =1 minOccurs = 0

Guidance on completion of schema element: Conditional. If water abstraction has been identified as a significant pressure at the RBD level, report the worst month of the year (in the format YYYY-MM) used in the calculation of the WEI+ for the worst month at RBD level. Reporting of the WEI+ for the worst month is not required in those cases where water scarcity does not exhibit a seasonal pattern.

Quality checks: Element check: weiWorstMonth must be reported in the format YYYY-MM.

Conditional check: Report if wqPressure is 'Yes', reportedUnderSoEQuantity is 'No' and weiWorst is not '0'.

Schema element: wqAlternativeIndicatorReference

Field type / facets: ReferenceType (see Annex 9)

Properties: maxOccurs =unbounded minOccurs = 0

Guidance on completion of schema element: Conditional. If water abstraction has been identified as a significant pressure at the RBD level, but it is not possible to report WEI+ values at RBD level, please provide a reference to documents where alternative indicators or equivalent water balances are developed. Provide a reference or hyperlink to the relevant document and section where specific information can be found. This information must be uploaded to WISE or made available on the web.

Guidance on the naming of files and documents to be uploaded to WISE is included in the user manual for reporting to WISE (see Annex 6).

If a hyperlink to information stored on a Member State's server is reported, the Member State must guarantee that the hyperlink will remain stable and active for a period of 6 years after reporting, and that the information referred to will not be revised or updated.

Quality checks: Conditional check: Report if wqPressure is 'Yes', reportedUnderSoEQuantity is 'No' and weiRBD is '0'.
Schema element: wqVolumeReferenceYear **Field type / facets:** YearRangeType **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. If water abstraction has been identified as a significant pressure at the RBD level, provide the reference year (in the format YYYY) or 5 year period (in the format YYYY--YYYY) used in the estimates of water consumption or the values of non-consumptive use, imports or exports. **Quality checks**: Element check: must be reported in the format YYYY (for a single year) or YYYY--YYYY (for a period). Conditional check: Report if wqPressure is 'Yes' and reportedUnderSoEQuantity is 'No'.
Schema element: wqCalculationMethodReference **Field type / facets:** ReferenceType (see Annex 9) **Properties:** maxOccurs =unbounded minOccurs = 0 **Guidance on completion of schema element**: Conditional. If water abstraction has been identified as a significant pressure at the RBD level, provide refernces or hyperlinks to documents containing further details on the method(s) used in the estimation of water quantity values for each parameter. Guidance on what should be included in this document is provided in Section 9.4.3.3. **Quality checks**: Conditional check: Report if wqPressure is 'Yes' and reportedUnderSoEQuantity is 'No'.

The following class (child of WaterQuantity) is used to report information for each 11 "water quantity use types".

Schema: RBMPPoM (continued)
Class WQUse ***Properties:*** *maxOccurs: 11 minOccurs: 0 (multiplicity is 0 or 11)* *Conditional check: Report information for the 11 water quantity use types if wqPressure is 'Yes' and reportedUnderSoEQuantity is 'No'.*
Schema element: wqUseType **Field type/facets:** WQUseTypeList_Enum: ConsumptiveUseAgricultureGW ConsumptiveUseAgricultureSW ConsumptiveUseIndustryEnergy ConsumptiveUseIndustryGW ConsumptiveUseIndustrySW

ConsumptiveUseWaterSupplyGW ConsumptiveUseWaterSupplySW DesalinatedWater ReusedWater WaterExports WaterImports **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element:** Required. For each use type that is a significant pressure, provide the information in the two elements below **Quality checks:** Within-schema check: information for all use types should be provided. Each use type should be chosen only once.
Schema element: wqCalculationMethod **Field type/facets:** WQCalculationMethod_Enum: List of calculation methods for water quantity (see Annex 8o) **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element:** Required. Select the method of calculation used for the estimation of the water quantity volumes
Schema element: wqUseVolume **Field type/facets:** NumberDecimalType **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element:** Conditional: Provide the annual volume for each water use that is a significant pressure in Hm^3. In case of ConsumptiveUseIndustryEnergy, if available, provide the percentage of the annual volume of surface water consumption from energy production in the RBD (Consumption = Abstractions – Returns), e.g. due to evaporation of cooling water, in relation to the total consumptive use of industry reported under ConsumptiveUseIndustrySW. **Quality checks:** reportif wqCalculationMethod is different from '**Water quantity use data not available**' and '**Water quantity use not relevant or not significant**'.

9.4.3.3. Guidance on the contents of RBMPs/background documents

The following provides guidance on the aspects that the European Commission expects to find in the relevant chapters on water abstraction in the RBMPs or in background documents. This guidance is not intended to be comprehensive in terms of what the Member States have to include in their RBMPs or background documents, rather to provide certain concrete elements of information that the European Commission expects to find.

Member States which consider that water abstraction is a significant pressure in the RBD should include a description on the method for estimating the water balance, water abstractions and water uses in the RBMPs or background documents.

- In case the data have resulted from hydrological and water balance modelling, a short review of the robustness of the used models, their ability to represent the salient features of the physical system, and the accuracy and bias of the simulations should be described in the background documents.

- In case indicators have been used, their representativity, robustness and sensitivity should be described in the background documents

9.4.3.4. Glossary of terms

Water consumptive use, from public supply: Total volume of freshwater used by end-users for a specific purpose within a territory, and which is provided to them by public water supply systems. Public water supply refers to water supplied by economic units engaged in collection, purification and distribution of water (excluding system operation for agricultural purposes and treatment of waste water solely in order to prevent pollution). It corresponds to division 41 NACE/ISIC independently of the sector involved. Deliveries of water from one public supply undertaking to another are excluded. Public water supply services provide water for domestic use, use at offices, restaurants and hotels, factories, municipal use etc. (all or some of these uses). Thus, since this depends on the system it may not be possible to separate which amount is intended for each user. In some cases of course this might be possible.

Reused water: Volume of water which has undergone wastewater treatment and is delivered to a user as reclaimed wastewater for reuse within the RBD. This means the direct supply of treated effluent to the user. Excluded is waste water discharged into a watercourse and used again downstream. Recycling is excluded. If this amount of water is made available for reuse to recipients which are located outside the RBD - in other words the water is exported for reuse elsewhere - this should not be reported here.

Water use, produced from desalination process: Total volume of water obtained from desalination processes for supply to water users.

Water imports and exports: Total volume of traded bulk water imported from, or exported to, another territory outside the RBD as a water transfer.

For ease of reference, common understanding and possible use of complementary reporting flows, Annex 2 provides an allocation of the relevant statistical classes (NACE) to the WFD list of pressures.

10. Programme of measures Reported at RBD/Sub-unit level (schema RBMPPoM)

10.1. Key Types of Measures to tackle significant pressures

10.1.1. Introduction

The WFD requires that, within each RBD, a Programme of Measures (PoM) is established to address the significant issues identified and to allow the achievement of the objectives established under

Article 4. The Directive further specifies that the PoM shall include as a minimum 'basic measures' and, where necessary to achieve objectives, 'supplementary measures'.

Basic measures as a minimum must comprise:

a) Measures required to implement existing Community water legislation and other environmental legislation (set out in Article 10 and in Part A of Annex VI – detailed below).

b) Measures to implement Article 9 (cost recovery).

c) Measures to promote efficient and sustainable water use.

d) Measures to protect drinking water quality and reduce level of treatment required.

e) Measures to control abstraction from surface and groundwater.

f) Measures to control recharging of groundwater.

g) Measures to control point source discharges.

h) Measures to prevent or control inputs of diffuse pollutants.

i) Measures to address any other significant impacts on status, in particular the hydromorphological condition.

j) Measures to prohibit direct discharges to groundwater.

k) Measures to eliminate or reduce pollution by Priority Substances.

l) Measures to prevent accidental pollution.

Legislation in Article 10 and in Part A of Annex VI:

(i) The Bathing Water Directive (76/160/EEC).

(ii) The Birds Directive (79/409/EEC).

(iii) The Drinking Water Directive (80/778/EEC) as amended by Directive (98/83/EC).

(iv) The Major Accidents (Seveso) Directive (96/82/EC).

(v) The Environmental Impact Assessment Directive (85/337/EEC).

(vi) The Sewage Sludge Directive (86/278/EEC).

(vii) The Urban Waste Water Treatment Directive (91/271/EEC).

(viii) The Plant Protection Products Directive (91/414/EEC).

(ix) The Nitrates Directive (91/676/EEC).

(x) The Habitats Directive (92/43/EEC).

(xi) The Integrated Pollution Prevention Control Directive (96/61/EC).

Supplementary measures are those measures designed and implemented in addition to the basic measures where they are necessary to achieve the Environmental Objectives of the WFD as established in Article 4 and Annex V. Supplementary measures can include additional legislative powers, fiscal measures, research, educational campaigns that go beyond the basic measures and are deemed necessary for the achievement of objectives.

According to Article 11(5), additional measures may be necessary when a water body is unlikely to achieve the objectives under Article 4, after the adoption of the measures under the first RBMP. If the implementation of an additional measure lasts longer than one river basin management planning cycle this measure becomes either a basic or supplementary measure.

Measures should be targeted in terms of their type and extent to ensure that pressures are addressed and that this will deliver improvements towards achieving good status or potential in individual water bodies. The measures should be designed based on the assessment of the actual status of the water body, supplemented with the information from the analysis of pressures and impacts affecting the water body.

10.1.2. Role of Key Types of Measures

The concept of Key Types of Measures (KTMs) was developed in 2012 to simplify reporting. This approach was the consequence of the large differences in the level of detail reported in 2010. Some Member States reported 10-20 measures whilst others reported hundreds or even thousands. KTMs are groups of measures identified by Member States in the PoMs which target the same pressure or purpose. The individual measures included in the PoM (being part of the RBMP) are grouped into KTMs for the purpose of reporting. The same individual measure can be part of more than one KTM because it may be multi-purpose, but also because the KTMs are not completely independent silos. There is certain degree of overlap to ensure that the Member States can more easily find the way to report their PoMs.

KTMs are expected to deliver the bulk of the improvements through reduction in pressures required to achieve WFD Environmental Objectives. A KTM may be one national measure but it would typically comprise more than one national measure. For example, in some Member States, the Nitrates Action Plan may be enough to reduce diffuse nutrient pollution from agriculture to levels consistent with the achievement of good ecological status or potential. In this case KTM2 (see list below) may be associated with one Article 11.3.a basic measure (i.e. implementation of the Nitrates Directive). In other Member States, basic measures under Article 11.3.h (binding rules for the control of diffuse pollution) and supplementary measures (Article 11.4) may also be required to achieve WFD Environmental Objectives: in the latter case, KTM2 would be associated with at least 3 national measures.

It is expected that the Member States will be able to report their PoMs by associating their national measures with the predefined KTMs. Given the fact that the predefined KTMs cover the main water management issues in the EU, the use of additional KTMs defined by the Member States is expected to be exceptional.

To provide information on the relative contribution of Article 11.3.a and 11.3. b to l basic measures and supplementary measures to KTMs and the achievement of WFD Environmental Objectives,

Member States are required to report on the national measures associated with the KTMs. Details of the individual measures are, however, not requested to be reported except for some targeted questions on basic measures and other specific aspects.

10.1.3. Predefined KTMs

Predefined Key Types of Measure (KTM) for the 2016 reports are based on the KTMs defined for the 2012 progress reports on implementation of programme of measures, the new ones reported by Member States in 2012 and commonly reported significant pressures not previously incorporated by predefined KTMs.

It is expected that most Member States will be able to report their measures in terms of predefined KTMs. The use of additional "new" KTMs should be very limited to facilitate comparability and the consolidation of information at EU level. The Member States are expected to "bundle" their national measures (usually much more detailed than the KTMs) to report them in an aggregated way as KTMs (see sections 10.1.2 Role of KTMs and below Mapping KTMs to individual measures). Quantitative indicators are reported at the level of KTMs.

The 25 predefined KTMs are listed below.

KTM number	KTM description
1	Construction or upgrades of wastewater treatment plants.
2	Reduce nutrient pollution from agriculture.
3	Reduce pesticides pollution from agriculture.
4	Remediation of contaminated sites (historical pollution including sediments, groundwater, soil).
5	Improving longitudinal continuity (e.g. establishing fish passes, demolishing old dams).
6	Improving hydromorphological conditions of water bodies other than longitudinal continuity (e.g. river restoration, improvement of riparian areas, removal of hard embankments, reconnecting rivers to floodplains, improvement of hydromorphological condition of transitional and coastal waters, etc).
7	Improvements in flow regime and/or establishment of ecological flows.
8	Water efficiency, technical measures for irrigation, industry, energy and households.
9	Water pricing policy measures for the implementation of the recovery of cost of water services from households.
10	Water pricing policy measures for the implementation of the recovery of cost of water services from industry.
11	Water pricing policy measures for the implementation of the recovery of cost of water services from agriculture.
12	Advisory services for agriculture.
13	Drinking water protection measures (e.g. establishment of safeguard zones, buffer zones etc).
14	Research, improvement of knowledge base reducing uncertainty.
15	Measures for the phasing-out of emissions, discharges and losses of Priority Hazardous Substances or for the reduction of emissions, discharges and losses of Priority Substances.
16	Upgrades or improvements of industrial wastewater treatment plants (including farms).
17	Measures to reduce sediment from soil erosion and surface run-off.
18	Measures to prevent or control the adverse impacts of invasive alien species and introduced diseases.
19	Measures to prevent or control the adverse impacts of recreation including angling.
20	Measures to prevent or control the adverse impacts of fishing and other exploitation/removal of animal and plants.
21	Measures to prevent or control the input of pollution from urban areas, transport and built infrastructure.
22	Measures to prevent or control the input of pollution from forestry.
23	Natural water retention measures.
24	Adaptation to climate change.

KTM number	KTM description
25	Measures to counteract acidification.

10.1.4. Mapping of pressures to KTMs

Guidance is provided on how KTMs might be applicable to significant pressures and chemical substances causing failure of objectives. This is done by mapping significant pressures, Priority Substances causing failure of good chemical status or other relevant objectives, and RBSPs causing failure of good ecological status or potential to the predefined KTMs. More than one KTM may apply to any particular pressure or substance depending on the impacts of the pressure (e.g. nutrient pollution, organic pollution or chemical pollution), and the specific conditions in a Member State. The results of the indicative mapping of pressures to KTMs are provided in Annex 3.

10.1.5. Quantitative indicators for the scale of pressures

In addition, quantitative indicators for the scale of the pressure or chemical substance failure are given for each significant pressure and, generically, for Priority Substances or RBSPs. These quantitative indicators are intended to provide information on the expected gap to be filled at the start of the second planning cycle in 2015 in terms of the scale of the pressure that needs to be reduced to achieve WFD Environmental Objectives. In terms of the achievement of good ecological status or potential, the gap to be filled would equate to the required reduction in pressures (e.g. loads of nutrients) so that water bodies at (or expected to be at) less than good status or potential in 2015 would achieve good status or potential. Values of the quantitative indicators are also required for 2021 and 2027, reflecting the scale of the pressure that would still be required to be tackled so that WFD Environmental Objectives can be achieved. The values for 2021 and 2027 would, therefore, be expected to be lower than the value for 2015.

It is recommended that Member States report one standard indicator for each pressure or chemical substance (number and length/area of water bodies affected by the relevant significant pressure or chemical substance) and at least one other predefined indicator specifically relevant for the individual pressure or chemical substance (as many as the Member State wishes). On the one hand, this will provide comparable information on the starting point and expected progress (using the standard indicator); and on the other hand, will enable Member States to choose the indicator for the pressure or chemical substance which is more suitable to their specific condition or for which information is readily available. In the event that Member States cannot report the predefined quantitative indicators, they are able to select and report their own quantitative indicators that best meet their specific conditions and situation. The list of predefined indicators is provided in Annex 8p.

Quantitative indicators are considered a management tool and represent the best estimate that the Member State can provide to show the gap to achieving good status or potential and the intended progress by a certain deadline. The quantification of pressures, as with any other process in the planning cycle, is subject to uncertainties. There will be cases where data and information are not available to produce a useful quantitative indicator. This may be particularly the case for certain pressures which are more difficult to quantify and/or in complex RBDs subject to many pressures, where it is difficult to disaggregate the pressure-measure relationships.

On this basis, the Member States are requested to report quantitative indicators for pressures to the best extent possible and for the pressures where this information is available or can be derived on the basis of a reasonable effort. In this regard, the lack of reporting of quantitative indicators for pressures does not imply a failure to comply with the WFD obligations. As an alternative, Member States can use other policy supporting tools to evaluate pressures and the effects of measures. In this case, a reference to these management tools should be reported.

Indicators are developed in such a way that they represent the gap to achieving good status or potential for each given significant pressure. Therefore, an indicator value of 0 would mean a level of pressure compatible with 100 % good status or potential, i.e. which would enable the affected water bodies to achieve good status or potential. However, given that the affected water bodies may be subject to other pressures, they may still not achieve good status or potential. In addition, good status or potential may not be achieved immediately due to natural conditions or the delayed response of the ecosystem.

Reporting of quantitative indicators for 2027 is optional. A value of the pressure indicator larger than 0 in 2027 would be interpreted as meaning that the Member State expects to rely on Article 4(5) setting lower Environmental Objectives. Alternatively, if the information is available, the Member State can report whether it expects to rely on the use of Article 4(5) for the last planning cycle (i.e. the percentage range of water bodies for which it expects good status would not be achieved in 2027).

10.1.6. Quantitative indicators for the scale and progress with implementation of measures

One or more quantitative indicators have been predefined for each KTM. These are intended to provide information on the scale of the measure that is expected to reduce the pressures to levels that enable WFD Environmental Objectives to be achieved. The value of the indicator at the start of the second planning cycle in 2015 would give information on the scale of the measure (e.g. number of wastewater treatment plants that need upgrading, the number of barriers that need modification to enable continuity, the length of buffer strips required to reduce diffuse emissions, etc) that would reduce the pressures to a level which would enable affected water bodies to achieve WFD Environmental Objectives. As with pressures, implementing certain KTMs may not be sufficient to achieve the objectives in a multi-pressure context.

Values of the quantitative indicators are also required for 2021 and 2027 to provide information on the expected progress of the measures over the second and third planning cycles. If all measures planned in 2015 were fully implemented and made operational by 2021, then the value of the indicator in 2021 would be 0. If the values of the indicator in 2015 and 2021 are the same it means no progress is expected between these dates (i.e. during the second planning cycle). The indicator values should get smaller as progress is made in the implementation of the measures.

Member States are able to select as many of the predefined quantitative indicators of KTM implementation as is appropriate to their conditions and situation but are asked to select at least one predefined indicator for each KTM. Member States are also able to select and report their own quantitative indicators that best meet their specific conditions and situation. Predefined indicators are provided in Annex 8r.

The quantification of measures to achieve the Environmental Objectives of the WFD is considered part of the WFD implementation. However, it can be a challenging task, in particular for pressures

for which the pressure-measure relationship is subject to larger uncertainties and also in complex RBDs subject to many pressures. There will be cases where data and information are not available to produce a useful quantitative indicator.

As with the quantitative indicators for pressures, the Member States are requested to report quantitative indicators for measures to the best extent possible and for the measures where this information is available or can be derived on the basis of a reasonable effort. In this regard, the lack of reporting of quantitative indicators for measures does not imply a failure to comply with the WFD obligations. As an alternative, MS can use other policy supporting tools to evaluate pressures and the effects of measures. In this case, a reference to these management tools should be reported.

KTMs can be relevant for more than one pressure, and for a single pressure, more than one KTM may be applicable. This many-to-many relationship requires a flexible reporting structure. The same significant pressures can be reported more than once if it is linked to several KTMs. The table below provides an example of this for diffuse pollution in agriculture, where KTM2 and KTM3 are relevant.

It will be possible to add other new KTMs that are important in a particular RBD where the significant pressure being tackled is not covered by one of the predefined KTMs. In this case, the Member State should also report a quantitative indicator of the expected progress of the measure over the second planning cycle, including definition of the indicator, units, value representing the situation in 2015 and the expected situation in 2021 at the end of the second planning cycle.

Indicators are developed in such a way that they represent the gap to achieving good status or potential for each given measure. Therefore, an indicator value of 0 would mean a KTM compatible with 100 % good status or potential, i.e. which would enable the affected water bodies to achieve good status or potential. However, given that the affected water bodies may be subject to other KTMs, they may still not achieve good status or potential. In addition, good status or potential may not be achieved immediately due to natural conditions or the delayed response of the ecosystem. Any new KTM indicators reported by Member States should be constructed in the same way.

Reporting of quantitative indicators for 2027 is optional. A value of the KTM indicator larger than 0 in 2027 would be interpreted as meaning that the Member State expects to rely on Article 4(5) setting lower Environmental Objectives. Alternatively, if the information is available, the Member State can report whether it expects to rely on the use of Article 4(5) for the last planning cycle (i.e. the percentage range of water bodies for which it expects good status would not be achieved in 2027).

The following table shows an example of the kind of information that could be derived from reporting (this table is a theoretical example given for illustrative purposes only):

For a particular RBD/Sub-unit:

SW or GW	Significant pressure or substance failing	Percentage of water bodies affected by significant pressure or by substance failure	Indicator for pressure (element IndicatorGap)	Indicator for scale of pressure 2015 (Value Indicator Gap2015)	Indicator for scale of pressure 2021 (Value Indicator Gap2021)	Indicator for scale of pressure 2027 (Value Indicator Gap2027)	KTM used to address this pressure or substance	Indicator for KTM (KTM Indicator)	Indicator of the scale of measure needed to achieve 100% GES/GEP/GCS (KTM Indicator Value2015)	Indicator of the remaining scale of measure needed to achieve 100% GES/GEP/GCS (KTM Indicator Value2021)	Indicator of the remaining scale of measure needed to achieve 100% GES/GEP/GCS (KTM Indicator Value2027)
SW	1.1. Point - urban waste water	25%	Number of water bodies affected	250	180	0	KTM1 construction or upgrade of WWTP	Number of WWTPs to be constructed or upgraded	53	25	0
			Length of water bodies affected (km)	2000	1300	0					
			Load of BOD to be reduced (in tonnes) to achieve objectives	50000	20000	0					
			Load of nitrogen to be reduced (in tonnes) to achieve objectives	4500	3250	0					
			Load of phosphorus to be reduced (in tonnes) to achieve objectives	300	200	0					
SW	1.2 Point - Storm overflows	13%	Number of water bodies affected	130	70	0	KTM1 construction or upgrade of	Number of urban areas where sewer	11	5	0

SW or GW	Significant pressure or substance failing	Percentage of water bodies affected by significant pressure or by substance failure	Indicator for pressure (element IndicatorGap)	Indicator for scale of pressure 2015 (Value Indicator Gap2015)	Indicator for scale of pressure 2021 (Value Indicator Gap2021)	Indicator for scale of pressure 2027 (Value Indicator Gap2027)	KTM used to address this pressure or substance	Indicator for KTM (KTM Indicator)	Indicator of the scale of measure needed to achieve 100% GES/GEP/GCS (KTM Indicator Value2015)	Indicator of the remaining scale of measure needed to achieve 100% GES/GEP/GCS (KTM Indicator Value2021)	Indicator of the remaining scale of measure needed to achieve 100% GES/GEP/GCS (KTM Indicator Value2027)
			Length of water bodies affected (km)	900	500	0	WWTP	systems need upgrading			
			Number of urban areas with excessive overflows	11	5	0					
SW	1.3 Point - IED plants	5%	Number of water bodies affected	50	0	0	KTM16 upgrades of industrial WWTP	Number of revised permit required to achieve objectives	16	0	0
			Length of water bodies affected (km)	300	0	0					
			Number of permits not compatible with objective	16	0	0					
SW	1.4 Point - non-IED plants	4%	Number of water bodies affected	40	0	0	KTM16 upgrades of industrial WWTP	Number of revised permit required to achieve objectives	7	0	0
			Length of water bodies affected (km)	230	0	0					
			Number of permits not compatible with objective	7	0	0					
SW	2.2 Diffuse - agriculture	60%	Number of water bodies affected	600	450	200	KTM2 Reduce nutrient pollution from	Area of agricultural land covered	6000	3000	700

SW or GW	Significant pressure or substance failing	Percentage of water bodies affected by significant pressure or by substance failure	Indicator for pressure (element IndicatorGap)	Indicator for scale of pressure 2015 (Value Indicator Gap2015)	Indicator for scale of pressure 2021 (Value Indicator Gap2021)	Indicator for scale of pressure 2027 (Value Indicator Gap2027)	KTM used to address this pressure or substance	Indicator for KTM (KTM Indicator)	Indicator of the scale of measure needed to achieve 100% GES/GEP/GCS (KTM Indicator Value2015)	Indicator of the remaining scale of measure needed to achieve 100% GES/GEP/GCS (KTM Indicator Value2021)	Indicator of the remaining scale of measure needed to achieve 100% GES/GEP/GCS (KTM Indicator Value2027)
			Length of water bodies affected (km)	4200	3100	1000	agriculture	by measures (km2) to achieve objectives			
			Load of nitrogen to be reduced (in tonnes) to achieve objectives	26000	20000	8000					
SW	2.2 Diffuse - agriculture	40%	Number of water bodies affected	400	250	100	KTM2 Reduce nutrient pollution from agriculture	Area of agricultural land covered by measures (km2) to achieve objectives	2400	1500	350
			Length of water bodies affected (km)	2200	1100	300					
			Load of phosphorus to be reduced (in tonnes) to achieve objectives	3500	1500	1000					
SW	2.2 Diffuse - agriculture	20%	Number of water bodies affected	200	100	0	KTM3 Reduce pesticide pollution from agriculture	Area of agricultural land covered by measures (km2) to achieve objectives	1000	500	0
			Length of water bodies affected (km)	1200	600	0					

SW or GW	Significant pressure or substance failing	Percentage of water bodies affected by significant pressure or by substance failure	Indicator for pressure (element IndicatorGap)	Indicator for scale of pressure 2015 (Value Indicator Gap2015)	Indicator for scale of pressure 2021 (Value Indicator Gap2021)	Indicator for scale of pressure 2027 (Value Indicator Gap2027)	KTM used to address this pressure or substance	Indicator for KTM (KTM Indicator)	Indicator of the scale of measure needed to achieve 100% GES/GEP/GCS (KTM Indicator Value2015)	Indicator of the remaining scale of measure needed to achieve 100% GES/GEP/GCS (KTM Indicator Value2021)	Indicator of the remaining scale of measure needed to achieve 100% GES/GEP/GCS (KTM Indicator Value2027)
GW	3.1 Abstraction - Agriculture	33%	Volume of water abstracted/ diverted for agriculture (million m3) to be reduced to achieve objectives	15000	12000	3000	KTM7 improvements flow regime and eflows	Number of revised permit required to achieve objectives			
SW	4.1.1 Physical alteration for flood protection	15%	Length in km of water bodies affected by alterations not compatible with GES/GEP	250	150	0	KTM6 improving hymo conditions	Length in km of water bodies that need restoration	250	150	0
SW	4.2.1 Dams barriers for hydropower	22%	Nb of dams with operating conditions not compatible with GES/GEP	85	45	5	KTM5 improving longitudinal continuity	Number of barriers required to be tackled for the achievement of objectives	85	45	5
SW	4.3.3 Hydrological alteration - hydropower	32%	Length in km of water bodies affected by hydrological alterations not compatible with GES/GEP	100	50	0	KTM7 improvements flow regime and eflows	Number of revised permits	75	40	0

10.1.7. How will the European Commission and the EEA use the information reported?

Information provided by Member States will be used by the European Commission to ensure that the provisions of Article 11 have been properly and consistently applied according to the WFD, and to produce policy relevant information about the implementation of the PoMs and the relevant measures.

Statistics and information will be provided to the European Parliament at EU level. Information will be provided to the public through WISE.

10.1.7.1. Products from reporting

Nb	Name of product	Type of product	Scale of information*	Detailed information displayed	Source of detailed information and aggregation rule	Used in 2012 reports?*
1	**Percentage of water bodies failing objectives due to different pressures**	Chart, table or map	EU/MS/RBD	Percentage of water bodies failing objectives due to different pressures, for all surface water bodies or by category	Information reported at RBD level.	No
2	**Costs of measures**	Chart, table or map	EU/MS/RBD	Total costs of the PoM or disaggregated by basic measures 11(3)a, basic measures 11(3)b-l and supplementary measures.	Information reported at RBD level.	No
3	**Measures in place to tackle significant pressures and chemical substances causing failure of objectives**	Assessment report	EU/MS/RBD	Measures in place to tackle significant pressures and chemical substances causing failure of objectives.	Information reported at RBD/Sub-unit level and also in specifically referenced documents or sections in the RBMP.	Yes
4	**Progress with implementing and making programmes of measures operational**	Assessment report	EU/MS/RBD	Expected progress during second and third planning cycles. Actual progress due to be reported in 2018 and 2024.	Information reported at RBD/Sub-unit level and also in specifically referenced documents or sections in the RBMP.	Yes

10.1.8. Contents of 2016 reporting

10.1.8.1. Schema sketch

See Annex 10.7.

10.1.8.2. Information and data to be reported using the schema

Schema: RBMPPoM (continued)
Class PoM *Properties: maxOccurs = unbounded minOccurs = 1*
Schema element: euSubUnitCode Field type / facets: FeatureUniqueEUCodeType Properties: maxOccurs =1 minOccurs = 0 Guidance on completion of schema element: Conditional. If applicable, report the unique EU code of the Sub-unit. If there are no sub-units this element does not need to be reported and the reporting of the information is done at RBD level. Sub-units are only relevant for surface water. Quality checks: Conditional check: Report if *RBDSUCA/RBD/*subUnitsDefined is 'Yes'. Element check: First 2 characters must be the Member State's 2-alpha character ISO country code.[120] Cross-schema check: euSubUnitCode must be consistent with codes reported in *RBDSUCA/RBD/SubUnit/*euSubUnitCode
Schema element: surfaceWaterOrGroundwater Field type / facets: SWBorGWB_Enum: Surface water Groundwater Properties: maxOccurs =1 minOccurs = 1 Guidance on completion of schema element: Required. Select surface water or groundwater in turn from the enumeration list where measures are required to achieve the WFD Environmental Objectives.

The following class (child of PoM) is used to report the significant pressure type(s) and Priority Substance(s) or RBSP(s) that are causing failure of good ecological status or potential, or failure of good chemical status.

Schema: RBMPPoM
Class SignificantPressureSubstanceFailing *Properties: maxOccurs = unbounded minOccurs = 1*
Schema element: significantPressureOrSubstanceFailing

[120] Member State's 2-alpha character ISO country code: http://publications.europa.eu/code/en/en-370100.htm (Note: for Greece use 'EL' and United Kingdom use 'UK')

Field type / facets: SignificantPressureOrSubstanceFailingType_Union_Enum: union of SignificantPressureType_Enum (Annex 1a) and ChemicalSubstances_Union_Enum (Annex 8e) **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Select in turn: - each significant pressure type in turn from the enumeration list that is, by itself or in combination with other pressures, significant in terms of Environmental Objectives not being met (i.e. is causing failure of good ecological status or potential or failure of good chemical status), - each Priority Substance that is causing failure of good chemical status - each RBSP that is causing failure of good ecological status or potential and for which measures are required to reduce the pressure to a level and extent that enables the Environmental Objectives to be met. More than one significant pressure type may be selected.
Schema element: significantPressureOrSubstanceFailingOther **Field type / facets**: string250Type **Properties**: maxOccurs = 1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. If 'significantPressureOrSubstanceFailing' is 'EEA_00-00-0 Other chemical parameter' please indicate in this field the CAS number (if relevant) and the name of the pollutant or indicator. **Quality check**: Conditional check: report if 'significantPressureOrSubstanceFailing' is 'EEA_00-00-0 Other chemical parameter'.
Schema element: useArticle45Beyond2027 **Field type / facets:** useArticle45Beyond2027_Enum: 0 0-10 10-20 20-50 >50% No information **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. For each significant pressure type and chemical substance reported, select the estimated percentage of water bodies from the enumeration list for which it is expected that less stringent objectives will be set under WFD Article 4(5) in the third cycle, i.e. the percentage of water bodies that are not expected to achieve good status or potential by 2027. If the information is not available, select 'No information'.

The following class (child of SignificantPressureSubstanceFailing) is used to report for each significant pressure type or chemical substance selected, the quantitative indicators of the scale of the pressures in terms of the gap required to be filled for the achievement of the Environmental Objectives.

Schema: RBMPPoM
Class IndicatorGap ***Properties:*** *maxOccurs = unbounded minOccurs = 1*
Schema element: indicatorGap **Field type / facets**: IndicatorPressure_Enum (see Annex 8p) **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. For each significant pressure type or chemical substance reported, select the pre-defined quantitative indicator of the scale and extent of the pressure or chemical substance that is to be reduced by measures to achieve Environmental Objectives. This is the gap to be filled to meet objectives. At least one of the pre-defined quantitative indicators must be selected from the enumeration list although more than one may be appropriate for the situation in the RBD. Select the '**PO99 – Other indicator**' option from the enumeration list to report details of additional quantitative indicators developed by the Member State in the relevant schema elements. For indicative purposes, the pressures and chemical substances have been mapped to the pre-defined Key Types of Measure (KTMs) (see Annex 3). Quantitative indicators have been proposed for each pressure or chemical substance causing failure and the relevant KTMs. All indicators are defined in terms of what needs to be done to achieve Environmental Objectives (i.e. good ecological status or potential or good chemical status). This means that the value of the indicator will be reduced with time as measures are implemented. A value of 0 is comparable with 100 % good ecological status or potential or good chemical status. Any 'Other' indicator reported by Member States should be constructed in the same way.
Schema element: indicatorGapOther **Field type / facets:** String 1000Type **Properties:** maxOccurs = 1 min minOccurs = 0 **Guidance on completion of schema element:** Conditional. If '**PO99 – Other indicator**' has been reported in indicatorGap, report a short name and description of the quantitative indicator of the scale and extent of the pressure or chemical substance that is to be reduced by measures to achieve Environmental Objectives. This is the gap to be filled to meet objectives. More than one 'Other' indicator may be reported. All indicators are defined in terms of what needs to be done to achieve Environmental Objectives (i.e. good ecological status or potential or good chemical status). This means that the value of the indicator will be reduced with time as measures are implemented. A value of 0 is comparable with 100 % good ecological status or potential or good chemical status. Any 'Other' indicator reported by Member States should be constructed in the same way. **Quality checks:** Conditional check: Report if indicatorGap is '**PO99 – Other indicator**'.
Schema element: indicatorGapValue2015 **Field type / facets:** NumberDecimalType **Properties**: maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. For each pre-defined quantitative indicator

selected in indicatorGap, report the expected value of that indicator at the start of the second cycle in 2015. The value for 2015 should give a quantitative indication of the scale of the measures still needed to achieve 100 % compliance with the achievement of Environmental Objectives (i.e. good ecological status or potential or good chemical status). This means that the value of the indicator will be reduced with time as measures are implemented. A value of 0 is comparable with 100 % good ecological status or potential or good chemical status.
Schema element: indicatorGapValue2021 Field type / facets: NumberDecimalType Properties: maxOccurs = 1 minOccurs = 1 Guidance on completion of schema element: Required. For each pre-defined quantitative indicator selected in IndicatorGap, report the expected value of that indicator at the start of the third cycle in 2021. The value for 2021 should give an indication of the expected situation in 2021 in terms of remaining measures needed to achieve Environmental Objectives (i.e. good ecological status or potential or good chemical status). The difference between the indicator value in 2015 and 2021 should provide an indication of the progress expected in the second cycle. If all measures needed to achieve the Environmental Objectives are expected to be fully operational, the value of the indicator should be 0.
Schema element: indicatorGapValue2027 Field type / facets: NumberDecimalType Properties: maxOccurs = 1 minOccurs = 0 Guidance on completion of schema element: Optional. For each pre-defined quantitative indicator selected in IndicatorGap, report the expected value of that indicator at the end of the third cycle in 2027. The value for 2027 should give an indication of the expected situation in 2027 in terms of remaining measures needed to achieve Environmental Objectives (i.e. good ecological status or potential or good chemical status). The difference between the indicator value in 2015 and 2027 should provide an indication of the overall progress expected in the second and third cycles. If all measures needed to achieve the Environmental Objectives are expected to be fully operational, the value of the indicator should be 0. Quality checks:

The following class (child of SignificantPressureSubstanceFailing) is used to report the selected Key Types of Measures to address the reported gap, and quantitative indicators of the expected progress during the second and third planning cycles.

Schema RBMPPoM (continued)
Class KeyTypeMeasureIndicator *Properties: maxOccurs = unbounded minOccurs = 1*

Schema element: keyTypeMeasure

Field type / facets: KTM_Enum (see Annex 8q)

Properties: maxOccurs = 1 minOccurs = 1

Guidance on completion of schema element: Required. For each significant pressure type and chemical substance reported, report the pre-defined Key Types of Measure (KTMs) that will be made operational to reduce the pressure or chemical substance.

More than one "Other key type of measure" (KTM99) may be relevant for a significant pressure type or chemical substance. Furthermore, there may be more than one indicator for a KTM. In those cases, each combination KTM/indicator should correspond to a separate entry. Therefore, the same KTM and the same indicator can be introduced more than once.

For example, in terms of diffuse agricultural pressures, KTM2 (reduce nutrient pollution from agriculture), KTM3 (Reduce pesticide pollution from agriculture) and KTM17 (measures to reduce sediment from soil erosion and surface run-off) may be applicable depending on the impacts of the agricultural diffuse pressures.

If the pre-defined KTMs are not appropriate, select the '**KTM99 – Other key type measure reported under PoM**' option from the enumeration list and report details of the other (new) KTMs developed by the Member State in the schema element keyTypeMeasureOther.

For indicative purposes, the pressures and chemical substances have been mapped to the pre-defined Key Types of Measure (KTMs) (see Annex 3). Quantitative indicators have been proposed for each pressure or chemical substance causing failure and the relevant KTMs.

Schema element: keyTypeMeasureOther

Field type / facets: String 1000Type

Properties: maxOccurs = 1 minOccurs = 0

Guidance on completion of schema element: Conditional. For each significant pressure type and chemical substance reported, report the name of Key Types of Measure (KTMs) if the pre-defined KTMs are not appropriate that will be made operational to reduce the pressure or chemical substance. More than one new KTM may be reported.

Quality checks: Conditional check: report if '**KTM99 – Other key type measure reported under PoM**' is reported in keyTypeMeasure.

Schema element: keyTypeMeasureIndicator

Field type / facets: IndicatorKTM_Enum (see Annex 8r)

Properties: maxOccurs = 1 minOccurs = 1

Guidance on completion of schema element: Required. Select the pre-defined quantitative indicator from the enumeration list that relates to each pre-defined KTM reported in keyTypeMeasure. The indicator selected should give an indication of the remaining measures that will need to be made operational to achieve Environmental Objectives.

At least one of the pre-defined quantitative indicators of the KTMs must be selected from the enumeration list although more than one may be appropriate for the situation in the RBD. Select the '**KO99 – Other indicator**' option from the enumeration list to report details of additional quantitative indicators of the KTMs developed by the Member State in the relevant schema

elements.

There may be more than one indicator for a KTM. In those cases, each combination KTM/indicator should correspond to a separate entry. Therefore, the same KTM and the same indicator can be introduced more than once.

For indicative purposes, the pressures and chemical substances have been mapped to the pre-defined Key Types of Measure (KTMs) (see Annex 3). Quantitative indicators have been proposed for each pressure or chemical substance causing failure and the relevant KTMs.

All indicators are defined in terms of what needs to be done to achieve Environmental Objectives (i.e. good ecological status or potential or good chemical status). This means that the value of the indicator will be reduced with time as measures are implemented. A value of 0 is comparable with 100 % good ecological status or potential or good chemical status. Any 'Other' indicator reported by Member States should be constructed in the same way.

Schema element: keyTypeMeasureIndicatorOther

Field type / facets: String1000Type

Properties: maxOccurs = 1 minOccurs = 0

Guidance on completion of schema element: Conditional. If '**KO99 – Other indicator**' has been reported in keyTypeMeasureIndicator, report a short name and description of the quantitative indicator relating to the KTMs. More than one 'Other' indicator may be reported.

All indicators are defined in terms of what needs to be done to achieve Environmental Objectives (i.e. good ecological status or potential or good chemical status). This means that the value of the indicator will be reduced with time as measures are implemented. A value of 0 is comparable with 100 % good ecological status or potential or good chemical status. Any 'Other' indicator reported by Member States should be constructed in the same way.

Quality checks: Conditional check: Report if keyTypeMeasureIndicator is '**KO99 – Other indicator**'.

Schema element: keyTypeMeasureIndicatorValue2015

Field type / facets: NumberDecimalType

Properties: maxOccurs = 1 minOccurs = 1

Guidance on completion of schema element: Required. For each pre-defined quantitative indicator relating to the KTMs selected in keyTypeMeasureIndicator, report the expected value of that indicator at the start of the second planning cycle in 2015.

The value for 2015 should give a quantitative indication of the scale of the measures still needed to achieve 100 % compliance with the achievement of Environmental Objectives (i.e. good ecological status or potential or good chemical status). This means that the value of the indicator will be reduced with time as measures are implemented. A value of 0 is comparable with 100 % good ecological status or potential or good chemical status.

Schema element: keyTypeMeasureIndicatorValue2021

Field type / facets: NumberDecimalType

Properties: maxOccurs = 1 minOccurs = 1

Guidance on completion of schema element: Required. For each pre-defined quantitative indicator relating to the KTMs selected in keyTypeMeasureIndicator, report the expected value of that

indicator at the start of the third cycle in 2021. The value for 2021 should give an indication of the expected situation in 2021 in terms of remaining measures needed to achieve Environmental Objectives (i.e. good ecological status or potential or good chemical status). The difference between the indicator value in 2015 and 2021 should provide an indication of the progress expected in the second cycle. If all measures needed to achieve the Environmental Objectives are expected to be fully operational, the value of the indicator should be 0.
Schema element: keyTypeMeasureIndicatorValue2027 Field type / facets: NumberDecimalType Properties: maxOccurs = 1 minOccurs = 0 Guidance on completion of schema element: Optional. For each pre-defined quantitative indicator relating to the KTMs selected in keyTypeMeasureIndicator, report the expected value of that indicator at the end of the third cycle in 2027. The value for 2027 should give an indication of the expected situation in 2027 in terms of remaining measures needed to achieve Environmental Objectives (i.e. good ecological status or potential or good chemical status). The difference between the indicator value in 2015 and 2027 should provide an indication of the overall progress expected in the second and third cycles. If all measures needed to achieve the Environmental Objectives are expected to be fully operational, the value of the indicator should be 0.

Mapping KTMs to individual measures

The following class allows mapping Key Types of Measures to individual measures in the Member States.

Schema: RBMPPoM (continued)
Class KTM *Properties: maxOccurs = unbounded minOccurs = 1*
Schema element: keyTypeMeasure Field type / facets / relationship: KTM_Enum (see Annex 8q) Properties: maxOccurs = 1 minOccurs = 1 Guidance on completion of schema element: Required. Select each appropriate pre-defined Key Type of Measure (KTM) or 'KTM99 – Other key type measure reported under PoM' in turn from the enumeration list used to reduce significant pressures in the RBD. Quality checks: Element check: keyTypeMeasure must be reported. A valid option must be selected from the enumeration list. More than one option can be selected.
Schema element: keyTypeMeasureOther Field type / facets: String 1000Type Properties: maxOccurs = 1 minOccurs = 0 Guidance on completion of schema element: Conditional. For each significant pressure type and

chemical substance reported, report the name of Key Types of Measure (KTMs) if the pre-defined KTMs are not appropriate that will be made operational to reduce the pressure or chemical substance. More than one New KTM may be reported.

Quality checks: Conditional check: report if '**KTM99 – Other key type measure reported under PoM**' is reported in keyTypeMeasure.

The following class (child of KTM) is used to report information on the individual measures (national or RBD specific measures) which are included in each KTM.

Schema: RBMPPoM (continued)
Class: Measure *Properties: maxOccurs = unbounded minOccurs = 1*
Schema element: measureCode **Field type / facets:** String1000Type **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. For each pre-defined or new KTM report the unique code of each national or RBD specific measure incorporated into the KTM.
Schema element: measureName **Field type / facets:** String1000Type **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Provide the name for each national or RBD measure. This should reflect the pressure that is being tackled by the measure.
Schema element: measureType **Field type / facets:** MeasureType_Enum: Basic Supplementary **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. For each pre-defined or new KTM indicate whether each national or RBD specific measure incorporated into the KTM is a basic measure as required under Article 11(3)(a) or Article 11(3)(b-l), or a supplementary measure as required under Article 11.4 when basic measures are not enough to tackle specific significant pressures.
Schema element: basicMeasureType **Field type / facets:** BasicMeasureType_Enum: Urban Waste Water Treatment Nitrates IPPC IED Habitats or Birds

Cost recovery water services

Efficient water use

Protection water abstraction

Controls water abstraction

Recharge augmentation groundwaters

Point source discharges

Pollutants diffuse

Hydromorphology

Pollutants direct groundwater

Surface Priority Substances

Accidental pollution

Other

Properties: maxOccurs = unbounded minOccurs = 0

Guidance on completion of schema element: Conditional. For each national or RBD specific measure incorporated into the KTM which is a basic measure, select from the enumeration list to which type of basic measure it corresponds. More than one option may be selected per measure.

See glossary below (10.1.10) for further guidance on the roles of basic and supplementary measures in the achievement of WFD Environmental Objectives.

'Urban Waste Water' = Urban Waste Water Treatment Directive (91/271/EEC)[121].

'Nitrates' = Nitrates Directive (91/676/EEC)[122].

'IPPC IED' = Integrated Pollution Prevention Control Directive (96/61/EC)[123] and the Industrial Emissions Directive (2010/75/EU)[124].

'Habitats or Birds' = Habitats Directive (92/43/EEC)[125] or Birds Directive (2009/147/EC)[126]

'Cost recovery water services' = Article 11(3)(b): Measures for the recovery of cost of water services (Article 9).

'Efficient water use' = Article 11(3)(c): Measures to promote efficient and sustainable water use.

'Protection water abstraction' = Article 11(3)(d): Measures for the protection of water abstracted

[121] http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31991L0271&from=EN

[122] http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31991L0676&from=en

[123] http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31996L0061&qid=1440765977288&from=EN

[124] http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32010L0075&qid=1440766031898&from=EN

[125] http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31992L0043&from=EN

[126] http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32009L0147&from=EN

for drinking water (Article 7) including those to reduce the level of purification required for the production of drinking water.

'Controls water abstraction' = Article 11(3)(e): Controls over the abstraction of fresh surface water and groundwater and impoundment of fresh surface waters including a register or registers of water abstractions and a requirement for prior authorisation of abstraction and impoundment.

'Recharge augmentation groundwaters' = Article 11(3)(f): Controls, including a requirement for prior authorisation of artificial recharge or augmentation of groundwater bodies.

'Point source discharges' = Article 11(3)(g): Requirement for prior regulation of point source discharges liable to cause pollution.

'Pollutants diffuse' = Article 11(3)(h): Measures to prevent or control the input of pollutants from diffuse sources liable to cause pollution.

'Hydromorphology' = Article 11(3)(i): Measures to control any other significant adverse impact on the status of water, and in particular hydromorphological impacts.

'Pollutants direct groundwater' = Article 11(3)(j): Prohibition of direct discharge of pollutants into groundwater.

'Surface Priority Substances' = Article 11(3)(k): Measures to eliminate pollution of surface waters by Priority Substances and to reduce pollution from other substances that would otherwise prevent the achievement of the objectives laid down in Article 4.

'Accidental pollution' = Article 11(3)(l): Any measures required to prevent significant losses of pollutants from technical installations and to prevent and/or reduce the impact of accidental pollution incidents.

'Other' = Other Directives mentioned in Part A of Annex VI of the WFD.

Quality checks: Conditional check: Report if measureType is 'Basic'.

Schema element: msfdRelevance

Field type / facets: YesNoLandlocked_Union_Enum

Yes

No

Landlocked country

Unclear

Properties: maxOccurs = 1 minOccurs = 1

Guidance on completion of schema element: Required. For each national or RBD specific measure incorporated into the KTM, report if it is relevant for the purpose of the Marine Strategy Framework Directive or not.

Schema element: measureReference

Field type / facets: ReferenceType (see Annex 9)

Properties: maxOccurs = unbounded minOccurs = 1

Guidance on completion of schema element: Required. Provide references or hyperlinks to the relevant documents and sections where specific information on the national or RBD specific

measures can be found. Guidance on what should be included in this document is provided in Section 10.1.9.

10.1.9. Guidance on the contents of RBMPs/background documents

Information on individual measures

The following provides guidance on the aspects that the European Commission expects to find in the relevant chapters on Key Types of Measures in the RBMPs or in background documents. This guidance is not intended to be comprehensive in terms of what the Member States have to include in their RBMPs or background documents, rather to provide certain concrete elements of information that the European Commission expects to find.

References are required to detailed information on the national measures associated with Key Types of Measures. This could be published in a structured manner in the RBMP or in a specific background document. It is recommended that Member States develop templates to include relevant information for each measure. See section 10.2.3 for specific information that is required for basic measures.

The information should, as a minimum, be structured in terms of:

- Measure code.
- Measure name.
- Type of measure (basic: Article 11(3)(a), basic: Article 11(3)(b-l), supplementary: Article 11(4)).
- Water categories in which it is applicable.
- Geographic coverage of the measure (national, RBD, Sub-unit, water body level).
- Whether the measure was already in place in the first RBMP, is being modified or is new in the second RBMP.
- Description of the measure (e.g. experience in the first cycle (if relevant), pressures tackled, voluntary or mandatory (see section 10.2.3 for specific elements required for basic measures 11(3)(b-l)).
- The contribution that the measure is expected to make towards the achievement of WFD Environmental Objectives in the second and third planning cycles.
- Any potential obstacles to its successful implementation.
- The lead organisation or Competent Authority responsible for the implementation of the measure.
- Partners responsible for assisting in the implementation of the measure (e.g. Amenity Groups, Non-Governmental Organisations (e.g. nature and river trusts), farmers, water industry, industry, local authorities, forestry agencies, mining and quarrying agencies, households, rural land managers and owners, navigation agencies, transport agencies, marine and fisheries agencies, nature agencies and regulators, other government departments, other).
- Information relating to the cost and financing of the measure and, in particular, whether financing has been secured for the second planning cycle.
- Sources of Funding (e.g. EU (Structural, Cohesion, Rural Development, Fisheries, LIFE or RTD), national funds (revenues from water charges, general budget)).

10.1.10. Glossary of terms

Basic Measures

Article 11.3 of the WFD states that basic measures are the minimum requirements to be complied with and shall consist of [127]:

- Paragraph a: those measures required to implement Community **legislation** for the protection of water, including measures required under the legislation specified in Article 10 and in part A of Annex VI. The most important of those are:
  - Measures to achieve compliance with the Nitrates Directive (91/676/EEC)[128], as defined in the Nitrates Action Programme under that Directive.
  - Measures to achieve compliance with the Urban Waste Water Treatment Directive (91/271/EEC)[129] as defined mainly in Articles 3, 4, and 5 and Annex I of that Directive.
  - Measures to achieve compliance with the Industrial Emissions Directive (2010/75/EC)[130], in particular the setting of emission limit values in accordance with BAT.
- Paragraphs b to l: measures that largely require binding rules that go beyond the national implementation of Article 11.3.a measures for the achievement of WFD Environmental Objectives. A number of paragraphs explicitly use the term "controls" in terms of, for example, the control of abstractions (paragraph e) (*e.g. requires abstraction permits to be revised in line with WFD requirements)*, diffuse sources (paragraph h) *(e.g. where phosphate, pesticides, sediment, organic pollution and ammonia from agriculture are identified as a pressure affecting the achievement of overall good status, controls must be established),* and activities that affect hydromorphological conditions (paragraph i) *(e.g. controls should be defined to ensure that actions in or near rivers do not negatively impact on morphological condition)*.

Supplementary measures (Article 11.4)

In certain situations, basic measures alone will not be sufficient to achieve good status and so supplementary measures may be needed. Member States must first have basic measures that are compliant with Article 11.3 and then, secondly, define supplementary measures and have a credible plan for securing and tracking progress on the established supplementary measures. Supplementary measures can be, for example, technical measures, advisory services or co-operative agreements between groups of stakeholders (see WFD Annex VI.B).

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[127] Meeting of the Strategic Co-ordination Group, 4 November 2013, Agenda point 4.a. Clarification on WFD programmes of measures (Article 11).

[128] http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31991L0676&from=en

[129] http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31991L0271&from=EN

[130] http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32010L0075&qid=1440766031898&from=EN

Basic and supplementary measures must, together, address the pressures to allow the achievement of the WFD Environmental Objectives.

10.2. Targeted questions on basic measures and other aspects

10.2.1. Contents of 2016 reporting

10.2.1.1. Schema sketch

See Annex 10.7.

10.2.1.2. Information and data to be reported using the schemas

Targeted questions on basic measures

The targeted questions included in the schema refer to Article 11(3) paragraphs b to l. Article 11.3 states that basic measures are the minimum requirements to be complied with and shall consist of measures under Article 11.3.a (i.e. those required to implement Community legislation for the protection of water) and those given under Article 11.3. b to l). While Article 11.3 (a-l) is prescriptive, the precise type of measure can be defined by the Member States depending on the specific pressures in a RBD. The targeted questions are asked in order to identify whether basic measures under Article 11.3 b to l have been planned for the second planning cycle and, in particular, the contribution they are expected to make to fill the gap to the achievement of WFD Environmental Objectives in the second and third planning cycles (the so-called "gap analysis"). An option has been included in each case in the event that basic measures of the relevant type have been implemented in the previous cycle and no modifications or additional measures are expected, the relevant reply should be selected 'Measures already implemented and made operational and no new measures or significant modifications expected'.

For each targeted question please provide a precise reference to a document or section of the RBMP which describes the existing measures, the planned implementation of any new measure or significant change to existing measure for the second (and, if relevant, the third) planning cycle and the contribution it is expected to make to the achievement of WFD Environmental Objectives. Please avoid general references to the PoMs, but make a precise reference to the section including the relevant measures for each question.

See section on the Guidance on the contents of RBMPs/background documents for more detail of the information expected to be provided in the RBMP and background documents.

Schema: RBMPPoM (continued)
Class: TargetedQ *Properties: maxOccurs = 1 minOccurs = 1*
Schema element: basicMeasuresArt113c Field type / facets: BasicMeasuresArt113c_Enum: Measures of this type implemented in previous cycle, no new measures nor significant changes

planned.

Measures of this type implemented in previous cycle but new measures and/or significant changes planned.

No measures of this type implemented in previous cycle but new measures and/or significant changes planned.

No measures of this type implemented in previous cycle and no measures planned.

Properties: maxOccurs = 1 minOccurs = 1

Guidance on completion of schema element: Required. Indicate whether there are measures promoting efficient and sustainable water use in order to avoid compromising the achievement of the objectives specified in Article 4 (Article 11.3.c*)* (e.g. water metering and allocations).

Schema element: basicMeasuresArt113d

Field type / facets: BasicMeasuresArt113d_Enum:

There are safeguard zones and there are no plans to change the regulations as a result of this RBMP.

There are safeguard zones but there will be significant changes to them implemented as a result of this RBMP.

There are no safeguard zones but there are plans to implement them as a result of this RBMP.

There are no safeguard zones and no plans to establish them.

Properties: maxOccurs = 1 minOccurs = 1

Guidance on completion of schema element: Required. Indicate whether there are measures to meet the requirements of Article 7, including measures to safeguard water quality in order to reduce the level of purification treatment required for the production of drinking water (i.e. have safeguard zones been established) (Article 11.3.d).

Schema element: basicMeasuresArt113ePermit

Field type / facets: BasicMeasures_Enum:

Yes, for surface and groundwater.

Yes, for surface water only.

Yes, for groundwater only.

No.

Properties: maxOccurs = 1 minOccurs = 1

Guidance on completion of schema element: Required. Indicate whether there is a concession, authorisation and/or permitting regime to control water abstractions (Article 11.3.e).

Schema element: basicMeasuresArt113eRegister

Field type / facets: BasicMeasures_Enum:

Yes, for surface and groundwater.

Yes, for surface water only.

Yes, for groundwater only. No. **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether there is a register of abstractions (Article 11.3.e).
Schema element: basicMeasuresArt113eThreshold **Field type / facets:** BasicMeasuresArt113eThreshold_Enum: Yes, small abstractions are exempted from controls. Small abstractions do not require permits but are all registered. No, there are no thresholds. Not relevant as there is no permitting regime and no register. **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether there are thresholds below which abstractions do not require permits and are not subject to registration (Article 11.3.e).
Schema element: basicMeasuresArt113eImpoundment **Field type / facets:** BasicMeasruesArt113eImpoundment_Enum: Yes, there is a concession, authorisation and/or permitting regime to control water impoundment and a register of impoundments. There is a concession, authorisation and/or permitting regime to control water impoundment but no register of impoundments. There is no concession, authorisation and/or permitting regime to control water impoundment but there is a register of impoundments. No, there is no concession, authorisation and/or permitting regime to control water impoundment and no register of impoundments. **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether there is a concession, authorisation and/or permitting regime to control water impoundment, and/or a register of impoundments (Article 11.3.e).
Schema element: basicMeasuresArt113f **Field type / facets:** BasicMeasuresArt113f_Enum: Measures of this type implemented in previous cycle, no new measures nor significant changes planned. Measures of this type implemented in previous cycle but new measures and/or significant changes planned. No measures of this type implemented in previous cycle but new measures and/or significant changes planned. No measures of this type implemented in previous cycle and no measures planned.

Properties: maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether controls are in place, including a requirement for prior authorisation of artificial recharge or augmentation of groundwater bodies (Article 11.3.f).
Schema element: basicMeasuresArt113gPermit **Field type / facets:** BasicMeasures_Enum: Yes, for surface and groundwater. Yes, for surface water only. Yes, for groundwater only. No. **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether there is an authorisation and/or permitting regime to control waste water point source discharges (Article 11.3.g).
Schema element*:* basicMeasuresArt113gRegister **Field type / facets:** BasciMeasures_Enum: Yes, for surface and groundwater. Yes, for surface water only. Yes, for groundwater only. No. **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether there is a register of waste water discharges (Article 11.3.g).
Schema element: basicMeasuresArt113gThreshold **Field type / facets:** BasicMeasuresArt113gThreshold_Enum: Yes, small discharges are exempted from controls. Small discharges do not require permits but are all registered. No, there are no thresholds. Not relevant as there is no permitting regime and no register. **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether there are thresholds below which waste water discharges do not require permits and are not subject to registration (Article 11.3.g).
Schema element: basicMeasuresArt113hRules **Field type / facets:** BasicMeasuresArt113hRules_Enum: Yes, same rules apply across the whole RBD.

Yes, but rules apply only in Nitrate Vulnerable Zones.

Yes, but there are differentiated rules for different parts of the RBDs.

No general binding rules.

Properties: maxOccurs = 1 minOccurs = 1

Guidance on completion of schema element: Required. Indicate whether there are general binding rules for the control of diffuse pollution from agriculture.

Schema element: basicMeasuresArt113hIssues

Field type / facets: BasicMeasuresArt113hIssues_Enum:

Nitrates

Phosphorus

Pesticides

Sediments

Organic pollution

Microbiological/bacteriological pollution

Other pollutants

Properties: maxOccurs = unbounded minOccurs = 0

Guidance on completion of schema element: Conditional. Report the issues covered if there are general binding rules.

Quality checks: Conditional check: Report if basicMeasuresArt113hRules is not 'No general binding rules'.

Schema element: basicMeasuresArt113iPermit

Field type / facets: YesNoCode_Enum: Yes. No

Properties: maxOccurs = 1 minOccurs = 1

Guidance on completion of schema element: Required. Indicate whether there is an authorisation and/or permitting regime to control physical modifications to the water bodies.

Schema element: basicMeasuresArt113iRiparian

Field type / facets: YesNoCode_Enum: Yes, No

Properties: maxOccurs = 1 minOccurs = 0

Guidance on completion of schema element: Conditional. If there is an authorisation and/or permitting regime to control physical modifications to the water bodies, indicate whether the regime covers changes to the riparian area of water bodies.

Quality checks: Conditional check: Report if basicMeasuresArt113iPermit is 'Yes'.

Schema element: basicMeasuresArt113iRegister

Field type / facets: YesNoCode_Enum: Yes, No

Properties: maxOccurs = 1 minOccurs = 1

Guidance on completion of schema element: Required. Indicate whether there is a register of

physical modifications of water bodies.
Schema element: basicMeasuresArt113j **Field type / facets:** BasicMeasuresArt113j_Enum: Yes, there is a prohibition of all direct discharges. Some direct discharges are authorised in accordance with Article 11.3.j. No, there is no prohibition of direct discharges. **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether there is a prohibition of direct discharges (Article 11.3.j).
Schema element: basicMeasuresArt113k **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether, in accordance with action taken pursuant to Article 16, there are measures to eliminate pollution of surface waters by those substances specified in the list of Priority Substances agreed pursuant to Article 16(2) and to progressively reduce pollution by other substances which would otherwise prevent Member States from achieving the objectives for the bodies of surface waters as set out in Article 4 (Article 11.3.k).
Schema element: basicMeasuresArt113c-kReference **Field type / facets:** ReferenceType (see Annex 9) **Properties:** maxOccurs = unbounded minOccurs = 1 **Guidance on completion of schema element**: Required. Provide references or hyperlinks to the relevant document and section where specific information can be found on the application of basic measures (Article 11.3.c-k). Guidance on what should be included in this document is provided in Section 10.2.3.

Targeted questions on other aspects

Schema: RBMPPoM (continued)
Class: TargetedQ (continued) *Properties: maxOccurs = 1 minOccurs = 1*
Schema element: waterReUse **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether re-use of water (e.g. from waste water treatment or industrial installations) is considered to have a lower environmental impact than other alternative water supplies (e.g. water transfers or desalinisation).
Schema element: waterReUseMeasure

Field type / facets: YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether re-use of water has been included in the RBMP as a measure in terms of managing water resources.
Schema element: ecologicalFlow **Field type / facets:** EcologicalFlow_Enum: Yes, ecological flows have been derived for all relevant water bodies. Partly, ecological flows have been derived for some relevant water bodies but the work is still on-going. No, ecological flows have not been derived for the relevant water bodies but there are plans to do it during the second cycle. No, ecological flows have not been derived for the relevant water bodies and there are no plans to do it during the second cycle. **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether ecological flows have been derived for all water bodies at risk of failing the Environmental Objectives due to abstractions, flow diversions or impoundments.
Schema element: ecologicalFlowImplementation **Field type / facets:** EcologicalFlowImplementation_Enum: Yes, ecological flows which have been derived have been implemented in all relevant water bodies. Partly, ecological flows which have been derived have been implemented in some relevant water bodies but the work is still on-going. No, ecological flows which have been derived have not been implemented but there are plans to do it during the second cycle. No, ecological flows which have been derived have not been implemented and there are no plans to do it during the second cycle. **Properties:** maxOccurs = 1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. Indicate whether the ecological flows already available have been implemented in all relevant water bodies. **Quality checks**: Conditional check: Report if ecologicalFlow is 'Yes…' or 'Partly…'.
Schema element: climateChange **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether projected climate changes have been assessed and taken into account in the second RBMP and PoM.
Schema element: climateChangeGuidance **Field type / facets:** YesNoCode_Enum: Yes, No

Properties: maxOccurs = 1 minOccurs = 0

Guidance on completion of schema element: Conditional. Indicate whether the CIS Guidance Document No. 24 'River basin in a changing climate'[131] has been used for taking climate change into account in the second RBMP and PoM.

Quality checks: Conditional check: Report if climateChange is 'Yes'.

Schema element: climateChangeAspectsConsidered

Field type / facets: ClimateChangeAspectsConsidered_Enum:

Assessing direct and indirect climate pressures

Detecting climate change signals

Monitoring change at reference sites

Setting objectives

Forecasting the economics of water supply and demand

Checking the effectiveness of measures

Preferential selection of robust adaptation measures

Maximisation of cross-sectoral benefits and minimisation of negative effects across sectors

Flood risk management

Drought management and water scarcity

Properties: maxOccurs = unbounded minOccurs = 0

Guidance on completion of schema element: Conditional. Select the aspects relating to climate change from the enumeration list that have been undertaken or considered in the second RBMP and PoM.

Quality checks: Conditional check: Report if climateChange is 'Yes'.

Schema element: floodsDirective

Field type / facets: YesNoCode_Enum: Yes, No

Properties: maxOccurs = 1 minOccurs = 1

Guidance on completion of schema element: Required. The Floods Directive requires that the development of the first Flood Risk Management Plans should be carried out in co-ordination with the review of the WFD RBMPs. Indicate whether the objectives and requirements of the Floods Directive have been considered in the second RBMP and PoM.

Schema element: winWinNWRMDroughtsFloods

Field type / facets: YesNoCode_Enum: Yes, No

Properties: maxOccurs = 1 minOccurs = 1

Guidance on completion of schema element: Required. Indicate whether specific win-win measures

[131] https://circabc.europa.eu/sd/a/a88369ef-df4d-43b1-8c8c-306ac7c2d6e1/Guidance%20document%20n%2024%20-%20River%20Basin%20Management%20in%20a%20Changing%20Climate_FINAL.pdf

in terms of achieving the objectives of the WFD and Floods Directive, drought management and use of Natural Water Retention Measures (NWRM) have been included in the PoM.
Schema element: structuralMeasures **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether the design of new and existing structural measures, such as flood defences, storage dams and tidal barriers, have been adapted to take into account WFD Environmental Objectives.
Schema element: msfdCoOrdination **Field type / facets:** YesNoLandlockedType_Union_Enum: Yes, No, Landlocked country **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether the preparations of the RBMP and PoM have been co-ordinated with the implementation of the Marine Strategy Framework Directive.
Schema element: msfdAssessment **Field type / facets:** YesNoLandlockedType_Union_Enum: Yes, No, Landlocked country **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether the need for additional measures or more stringent measures beyond those required by the WFD in order to contribute to the achievement of the relevant MSFD objectives in coastal and marine environments have been considered in the PoM.
Schema element: msfdMeasuresNeeded **Field type / facets:** MSFDMeasuresNeeded_Enum: Nutrients Chemicals Litter Others None **Properties:** maxOccurs = unbounded minOccurs = 0 **Guidance on completion of schema element**: Conditional. If the need for additional measures or more stringent measures beyond those required by the WFD in order to achieve the relevant MSFD objectives in coastal and marine environments have been considered in the PoM, select the additional measures needed to meet the MSFD objectives from the enumeration list. 'None' should be selected if the need for additional measures was considered but the conclusion was that no additional measures are needed. **Quality checks**: Conditional check: Report if msfdAssessment is 'Yes'.
Schema element: otherAspectsReference

Field type / facets: ReferenceType (see Annex 9)

Properties: maxOccurs = unbounded minOccurs = 0

Guidance: Conditional. Provide references or hyperlinks to the documents and sections where specific information can be found on the other aspects above where targeted questions are asked. Guidance on what should be included in this document is provided in Section 10.2.3.

Quality checks: Conditional check: Report if any of the following elements take the indicated values: waterReUse is 'Yes', waterReUseMeasure is 'Yes', ecologicalFlow is 'Yes…' or 'Partly…', climateChange is 'Yes', floodsDirective is 'Yes', winWinNWRMDroughtsFloods is 'Yes', structuralMeasures is 'Yes', msfdCoOrdination is 'Yes', msfdAssessment is 'Yes'

10.2.2. GIS information

None.

10.2.3. Guidance on the contents of RBMPs/background documents

Basic measures

The following provides guidance on the aspects that the European Commission expects to find in the relevant chapters on basic measures in the RBMPs or in background documents. This guidance is not intended to be comprehensive in terms of what the Member States have to include in their RBMPs or background documents, rather to provide certain concrete elements of information that the European Commission expects to find.

The information required for basic measures is the same as included in section 10.1.9 for individual measures. This section, however, includes further specification of information that is required for the indicated types of basic measures. This information may be included in the RBMPs or in background documents made available to the European Commission.

It is recommended that Member States develop templates to include, for each measure, all relevant information (see section 10.1.9). In order to simplify presentation, several measures contributing to the same purpose under Articles 11(3)(b-l) may be included in the same template.

In describing the measures it is important to make clear the elements which are already implemented and the plans for the second cycle. Member States are requested to ensure that the description of the basic measures includes the following information (non-exhaustive):

- For measures under Article 11(3)d for the protection of water abstractions used for the protection of drinking water, include in the description of the measure, if relevant:
    - General size of the safeguard zones or criteria for their establishment.
    - Types of bans or restrictions that are in force in safeguard zones (e.g. application of pesticides, fertilisers/manure, building, and industrial activities).
    - Types of measures which are mandatory in safeguard zones (e.g. buffer strips, planting of trees).

- For measures under Article 11(3)e for the control of abstractions of freshwater, include in the description of the measures, if relevant:
    - Existence of a register for all surface and groundwater abstractions.
    - Existence of a register for all impoundments.
    - Description of the concessions, authorisations or permit regime for abstractions, including thresholds below which abstraction concessions, authorisations or permits and/or registration are not needed.
    - Obligations for users of different types to use metering devices.
    - Existence of a register of water consumption by user for all sectors.
    - Existence of an obligation to review abstractions within a fixed period (e.g. every 5, 10 or more years) or only if required.
    - Describe whether the authorities are bound by the WFD Environmental Objectives in the concessions, authorisations or permitting process, i.e. if the authorities must or can refuse a permit if it compromises the achievement of the WFD Environmental Objectives in the affected water bodies.
- For measures under Article 11(3)g for the control of point source discharges liable to cause pollution, include in the description of the measures, if relevant:
    - The authorisation or permit regime for the control of urban and industrial waste water discharges including if there are thresholds below which an authorisation is not needed, if there are general binding rules, etc.
    - Whether the scope of the authorisation or permit regime or the general binding rules includes run-off from urban areas, industrial installations and farm holdings.
    - Existence of an obligation to review discharge permits within a fixed period (e.g. every 5, 10 or more years) or only if required.
    - Describe whether the authorities are bound by the WFD Environmental Objectives in the authorisation or permitting process, i.e. if the authorities must or can refuse a permit if it compromises the achievement of the WFD Environmental Objectives in the affected water bodies.
- For measures under Article 11(3)h for the control of diffuse sources liable to cause pollution, include in the description of the measures, if relevant:
    - Controls or binding requirements at farm level to address diffuse sources of nutrients (Nitrates and/or Phosphates) outside of Nitrate Vulnerable Zones.
    - Controls or binding requirements at farm level to address diffuse sources of pesticides.

  - Controls or binding requirements at farm level to address soil erosion and pollution of water bodies with sediment.
  - Controls or binding requirements at farm level to address diffuse sources of organic pollution and microbial contamination.

- For measures under Article 11(3)i for the control of hydromorphological modifications, include in the description of the measures, if relevant:
  - Description of the authorisation regime and/or general binding rules for physical modifications of water bodies including the type of modifications that are subject to control.
  - Whether physical modifications of the riparian area are subject to control.
  - Thresholds below which physical modifications are exempted from authorisation, if any.

Other aspects

Information about the following issues is expected to be found in the relevant sections of the RBMP or background documents.

- How have projected climate changes been assessed and taken into account in the second RBMP and PoM?
- What aspects and impacts of climate change have been considered when developing the second RBMP and PoMs?
- The Floods Directive requires that the development of the first Flood Risk Management Plans should be carried out in co-ordination with the reviews of the WFD RBMPs. How have the objectives and requirements of the Floods Directive been considered in the second RBMP and PoM?
- How has the PoM for the second cycle contributed to mitigating the effects of floods and droughts?
- What specific win-win measures in terms of achieving the objectives of the WFD and Floods Directive have been included in the PoM?
- What natural water retention and green infrastructure measures have been included in the PoM?
- How has the design of new and existing structural measures, such as flood defences, storage dams and tidal barriers, been adapted to take into account WFD Environmental Objectives?
- Has the use of sustainable drainage systems, such as the construction of wetland and porous pavements, been considered to reduce urban flooding and also to contribute to the achievement of WFD Environmental Objectives?

- Provide details of the application of Article 4(7) of the WFD for new flood defence projects and infrastructure.

- Provide details on the co-ordination of the public participation and stakeholder consultation during the development of RBMPs and Flood Risk Management Plans.

- The need for and, if required, the development of a specific drought management (sub)plan should be included in the RBMP.

- How measures designed to improve the efficiency of water use have been planned, particularly in relation to their use and prioritisation against alternative infrastructure measures to increase supply.

- How the re-use of water (e.g. from waste water treatment or industrial installations) has been included in the RBMP as a measure in terms of managing water resources, particularly in terms of its magnitude and its expected effects on water abstractions and the need for demand management or infrastructure supply measures.

- How has the second RBMP taken into account the relevant measures being planned for the first PoM for the Marine Strategy Framework Directive (2008/56/EC)[132].

10.3. Estimates of cost of measures

10.3.1. Introduction

Article 19 of the WFD requires the European Commission to review the Directive and to propose any necessary amendments. As a part of this review, the European Commission needs to be able to assess the costs and benefits of the implementation of the Directive.

10.3.2. How will the European Commission and the EEA use the information reported?

The European Commission will use the information reported to ensure that Member States are implementing the WFD appropriately and consistently; to identify any financial barriers that may be obstructing implementation; to identify the costs of implementation for RBDs, Member States and the total costs of implementation, and to carry out a full cost-effectiveness analysis of the WFD.

Statistics and information will be provided to the European Parliament at EU level. Information will be provided to the public through WISE.

10.3.2.1. Products from reporting

Nb	Name of product	Type of product	Scale of information*	Detailed information displayed	Source of detailed information and aggregation rule	Used in 2012 reports?*

[132] http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32008L0056&qid=1440766714959&from=EN

Nb	Name of product	Type of product	Scale of information*	Detailed information displayed	Source of detailed information and aggregation rule	Used in 2012 reports?*
1	Costs of measures	Chart, table or map	EU/MS/RBD	Total costs of the PoM or disaggregated by basic and supplementary measures.	Information reported at RBD level	No

10.3.3. Contents of the 2016 reporting

10.3.3.1. Schema sketch

See Annex 10.7.

10.3.3.2. Information and data to be reported using the schema

Schema: RBMPPoM (continued)
Class: Costs *Properties: maxOccurs = 1 minOccurs = 1*
Schema element: costOfMeasuresScale20092015 Field type / facets: MSorRBD_Enum: Member State RBD Properties: maxOccurs = 1 minOccurs = 1 Guidance on completion of schema element: Required. Indicate whether the costs reported refer to this specific RBD or for the Member State as a whole.
Schema element: costOfMeasuresPeriod20092015 Field type / facets: YearRangeType Properties: maxOccurs = 1 minOccurs = 1 Guidance on completion of schema element: Required. Report the time period (e.g. 2009--2015, 2009--2014, etc) to which the reported costs refer. Quality checks: Element check: Period must be reported in the format YYYY--YYYY.
Schema element: article113aInvestment20092015 Field type / facets: NumberDecimalType Properties: maxOccurs = 1 minOccurs = 1 Guidance on completion of schema element: Required. Report the total investment expenditure (in millions of Euros) of measures under Article 11.3.a that were effectively implemented during the first planning cycle. Expenditure should not be annualised. The total investment expenditure should include, for example, expenditure on construction of

waste water treatment plants. If disaggregated data is not available, then report '0' in this element and report the aggregated data in article113al114115Investment20092015.
Schema element: article113bl114115Investment20092015 **Field type / facets:** NumberDecimalType **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Report the total investment expenditure (in millions of Euros) of measures under Articles 11.3.b-l and Articles 11.4 and 11.5 that were effectively implemented during the first planning cycle. Expenditure should not be annualised. Total investment expenditure should include, for example, expenditure on infrastructure to control over-abstraction. If disaggregated data is not available, then report '0' in this element and report the aggregated data in article113al114115Investment20092015.
Schema element: article113al114115Investment20092015 **Field type / facets:** NumberDecimalType **Properties:** maxOccurs = 1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. Report the total investment expenditure (in millions of Euros) of measures under Articles 11.3.a, 11.3.b-l, 11.4 and 11.5 that were effectively implemented during the first planning cycle if only aggregated data is available. Expenditure should not be annualised. Total investment expenditure should include, for example expenditure on construction of waste water treatment plants. **Quality checks**: Conditional check: Report if article113aInvestment20092015 and article113bl114115Investment20092015 are both '0'.
Schema element: costExplanation20092015Reference **Field type / facets:** ReferenceType (see Annex 9) **Properties:** maxOccurs = unbounded minOccurs = 1 **Guidance on completion of schema element**: Required. Provide a reference or hyperlink to the relevant document and section where specific information can be found on how the costs reported for the first planning cycle have been calculated. This information must be uploaded to WISE or made available on the web. Guidance on the naming of files and documents to be uploaded to WISE is included in the user manual for reporting to WISE (see Annex 6). If a hyperlink to information stored on a Member State's server is reported, the Member State must guarantee that the hyperlink will remain stable and active for a period of 6 years after reporting, and that the information referred to will not be revised or updated.
Schema element: costOfMeasuresScale20152021

Field type / facets: MSorRBD_Enum:

Member State

RBD

Properties: maxOccurs = 1 minOccurs = 1

Guidance on completion of schema element: Required. Indicate whether the costs reported refer to this specific RBD or for the Member State as a whole.

Quality checks:

Schema element: costOfMeasurePeriod20152021

Field type / facets: YearRangeType

Properties: maxOccurs = 1 minOccurs = 1

Guidance on completion of schema element: Required. If the reported costs are not for the whole of the second planning cycle, report the reference year (in the format YYYY) or period (in the format YYYY--YYYY) used as the basis of the calculation of costs.

Quality checks: Element check: Reference year must be reported in the format YYYY. Reference period must be reported in the format YYYY--YYYY.

Schema element: article113aInvestment20152021

Field type / facets: NumberDecimalType

Properties: maxOccurs = 1 minOccurs = 1

Guidance on completion of schema element: Required. Report the total investment expenditure (in millions of Euros) of planned measures under Article 11.3.a during the second planning cycle.

Expenditure should not be annualised.

Total investment expenditure should include, for example, expenditure on construction of waste water treatment plants.

Schema element: article113aAnnual20152021

Field type / facets: NumberDecimalType

Properties: maxOccurs = 1 minOccurs = 1

Guidance on completion of schema element: Required. Report the total annual operational and maintenance costs, and any other costs, (in millions of Euros) of planned measures under Article 11.3.a during the second planning cycle.

Total annual costs should exclude all annual costs of waste water treatment plant functioning.

Total annual costs should exclude depreciation. Indicate this in article113aDepreciation20152021.

Schema element: article113aDepreciation20152021

Field type / facets: YesNoCode_Enum: Yes, No

Properties: maxOccurs = 1 minOccurs = 1

Guidance on completion of schema element: Required. Indicate whether depreciation has been included in the total annual costs reported in article113aAnnual20152021. The default selection

should be 'No' (i.e. it has been excluded).
Schema element: article113bl114115Investment20152021 **Field type / facets:** NumberDecimalType **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Report the total investment expenditure (in millions of Euros) of planned measures under Articles 11.3.b-l and Articles 11.4 and 11.5 during the second planning cycle. Expenditure should not be annualised. Total investment expenditure should include, for example, expenditure on infrastructure to control over-abstraction.
Schema element: article113bl114115Annual20152021 **Field type / facets:** NumberDecimalType **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Report the total annual operational and maintenance costs, and any other costs, (in millions of Euros) of planned measures under Articles 11.3.b-l, and 11.4 and 11.5 during the second planning cycle. Total annual costs should exclude all annual costs related to controls on over-abstraction. Total annual costs should exclude depreciation. Indicate this in article113bl114115Depreciation20152021.
Schema element: article113bl114115Depreciation20152021 **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether depreciation is included in the total annual costs reported in article113bl114115Annual20152021. The default selection should be 'No' (i.e. it has been excluded).
Schema element: costExplanation20152021Reference **Field type / facets:** ReferenceType (see Annex 9) **Properties:** maxOccurs = unbounded minOccurs = 1 **Guidance on completion of schema element**: Required. Provide references or hyperlinks to the relevant documents and sections where specific information can be found on how the costs reported for the second planning cycle have been calculated. . Guidance on what should be included in this document is provided in Section 10.3.3.3.

Financing of measures

Member States' PoMs contain different instruments (legal, administrative, technical, infrastructure, training, etc), and are potentially funded in different ways. In terms of financing PoMs, public budget is expected to cover part of the cost of the measures but also private operators are

expected to provide funds (e.g. through the cost recovery provisions). European funds, such as Structural, Cohesion or CAP funds, can also contribute to financing some measures.

Schema: RBMPPoM (continued)
Class: Costs *Properties: maxOccurs = 1 minOccurs = 1*
Schema element: euFunds20092015 Field type / facets: String25Type Properties: maxOccurs = 1 minOccurs = 1 Guidance on completion of schema element: Required. Report the total investment expenditure for the Programme of Measures for the first planning cycle, which were financed by EU funds as an estimated cost or range.
Schema element: euFunds20152021 Field type / facets: String25Type Properties: maxOccurs = 1 minOccurs = 1 Guidance on completion of schema element: Required. Report the estimated total investment expenditure for the Programme of Measures for the second planning cycle that are expected to be financed by EU funds, as an estimated cost or range.

10.3.3.3. Guidance on contents of RBMPs/Background documents

The following provides guidance on the aspects that the European Commission expects to find in the relevant chapters on costs of meaasures in the RBMPs or in background documents. This guidance is not intended to be comprehensive in terms of what the Member States have to include in their RBMPs or background documents, rather to provide certain concrete elements of information that the European Commission expects to find.

The RBMP and background documents must explain how the costs of measures have been calculated. This should include:

- Calculation methods for assessing costs.
- Costs included or excluded.
- Whether the costs calculated include only public budget or whether costs for private operators are also included.
- Supporting explanation on factors affecting the costs of measures.
- If available, a reference or document presenting the estimate of the share of costs of the PoM 2015-2021 that result from measures from the 2009-2015 PoM that could not be implemented and that have been transferred to the 2015-2021 PoM, along with

explanations on factors explaining this situation in overall terms and also for specific sectors (see WFD Annex VII.B.3).

- If available, include projections on investment expenditure for the third planning cycle 2021-2027.

10.4. Co-ordination of measures in international RBDs

10.4.1. Introduction

The WFD requires co-ordination of the Programmes of Measures in transboundary River Basin Districts.

10.4.2. How will the European Commission and the EEA use the information reported?

The European Commission will assess whether the PoMs have been sufficiently co-ordinated in transboundary RBDs. Statistics and information will be provided to the European Parliament at EU level. Information will be provided to the public through WISE.

10.4.2.1. Products from reporting

Nb	Name of product	Type of product	Scale of information*	Detailed information displayed	Source of detailed information and aggregation rule	Used in 2012 reports?*
1	Degree of co-ordination of PoMs in IRBDs	Chart Table or Map	EU/MS/RBD/IRBD		Information reported at RBD/IRBD level.	Yes
2	Number of co-ordinated measures to tackle river continuity, nutrient reduction and chemical pollution in each IRBP	Chart or Table	EU/MS/RBD/IRBD		Information reported at RBD/IRBD level.	No
3	Number of specific key activities co-ordinated, partially co-ordinated, not co-ordinated or not specified in each IRBP	Chart or Table	Chart or Table		Information reported at RBD/IRBD level.	No

10.4.3. Contents of 2016 reporting

10.4.3.1. Schema sketch

See Annex 10.7.

10.4.3.2. Information and data to be reported using the schemas

Schema: RBMPPoM (continued)
Class: CoOrd *Properties: maxOccurs = 1 minOccurs = 1*
Schema element: pomInternationalRBD Field type / facets: YesNoCode_Enum: Yes, No Properties: maxOccurs = 1 minOccurs = 1 Guidance on completion of schema element: Required. Indicate whether the RBD is part of an international RBD.
Schema element: pomCoOrdinationJointVision Field type / facets: Coord_Enum: Yes with other MS, Yes with non-MS, Yes with both other MS and non-MS, None Properties: maxOccurs = 1 minOccurs = 0 Guidance on completion of schema element: Conditional. Have joint visions and management objectives been established for the coordination of the Programme of Measures? Quality checks: Conditional check: Report if pomInternationalRBD is 'Yes'.
Schema element: pomCoOrdinationArt5SWMI Field type / facets: Coord_Enum: Yes with other MS, Yes with non-MS, Yes with both other MS and non-MS, None Properties: maxOccurs = 1 minOccurs = 0 Guidance on completion of schema element: Conditional. Has the Article 5 analysis and identification of Significant Water Management Issues been co-ordinated in the development of the Programme of Measures? Quality checks: Conditional check: Report if pomInternationalRBD is 'Yes'.
Schema element: pomCoOrdinationIRBMPPoM Field type / facets: Coord_Enum: Yes with other MS, Yes with non-MS, Yes with both other MS and non-MS, None Properties: maxOccurs = 1 minOccurs = 0 Guidance on completion of schema element: Conditional. Have international RBMP and PoM been produced for the second cycle incorporating all Member States? Quality checks: Conditional check: Report if pomInternationalRBD is 'Yes'.

Schema element: pomCoOrdinationRoofReport Field type / facets: Coord_Enum: Yes with other MS, Yes with non-MS, Yes with both other MS and non-MS, None Properties: maxOccurs = 1 minOccurs = 0 Guidance on completion of schema element: Conditional. Has an international Roof Report (or A-plan) covering all Member States, based on the national River Basin Management Plans (or B-plans) been prepared? Quality checks: Conditional check: Report if pomInternationalRBD is 'Yes'.
Schema element: pomCoOrdinationLinks Field type / facets: Coord_Enum: Yes with other MS, Yes with non-MS, Yes with both other MS and non-MS, None Properties: maxOccurs = 1 minOccurs = 0 Guidance on completion of schema element: Conditional. Haveexplicit links been made with national RBMPs within the international RBMP? Quality checks: Conditional check: Report if pomInternationalRBD is 'Yes'.
Schema element: pomCoOrdinationSectors Field type / facets: Coord_Enum: Yes with other MS, Yes with non-MS, Yes with both other MS and non-MS, None Properties: maxOccurs = 1 minOccurs = 0 Guidance on completion of schema element: Conditional. Has there been sectoral and stakeholder involvement within the international co-ordination mechanisms? Quality checks: Conditional check: Report if pomInternationalRBD is 'Yes'.
Schema element: pomCoOrdinationTransparency Field type / facets: Coord_Enum: Yes with other MS, Yes with non-MS, Yes with both other MS and non-MS, None Properties: maxOccurs = 1 minOccurs = 0 Guidance on completion of schema element: Conditional. Has there been transparency of international co-ordination to stakeholders and others? Quality checks: Conditional check: Report if pomInternationalRBD is 'Yes'.
Schema element: pomCoOrdinationFinancial Field type / facets: Coord_Enum: Yes with other MS, Yes with non-MS, Yes with both other MS and non-MS, None Properties: maxOccurs = 1 minOccurs = 0 Guidance on completion of schema element: Conditional. Have financial resources for joint co-operation been made available? Quality checks: Conditional check: Report if pomInternationalRBD is 'Yes'.

Schema element: iRBMPIssuesNutrient **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. Does the international RBMP address nutrient pollution? **Quality checks**: Conditional check: Report if pomInternationalRBD is 'Yes'.
Schema element: iRBMPIssuesSediment **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. Does the international RBMP address sediment management? **Quality checks**: Conditional check: Report if pomInternationalRBD is 'Yes'.
Schema element: iRBMPIssuesChemical **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. Does the international RBMP address chemical pollution? **Quality checks**: Conditional check: Report if pomInternationalRBD is 'Yes'.
Schema element: iRBMPIssuesRiverContinuity **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. Does the international RBMP address river continuity? **Quality checks**: Conditional check: Report if pomInternationalRBD is 'Yes'.
Schema element: iRBMPIssuesOtherHydromorphological **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. Does the international RBMP address other hydromorphological measures? **Quality checks**: Conditional check: Report if pomInternationalRBD is 'Yes'.
Schema element: iRBMPIssuesOther **Field type / facets:** String100Type **Properties:** maxOccurs = 1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. Report if there are other issues addressed by the international RBMP which are not covered in the previous questions. If no other issue report

'None'. **Quality checks**: Conditional check: Report if pomInternationalRBD is 'Yes'.
Schema element: iRBMPReference **Field type / facets:** ReferenceType (see Annex 9) **Properties:** maxOccurs = unbounded minOccurs = 0 **Guidance on completion of schema element**: Conditional. Provide a reference or hyperlink to the international RBMP. **Quality checks**: Conditional check: Report if pomInternationalRBD is 'Yes'.

10.5. Progress with and achievements of the programme of measures for the first planning cycle

10.5.1. Introduction

In 2012, Member States provided information on the progress in implementing the WFD PoMs, including the state of implementation of basic, supplementary and Key Types of Measure. Information was also provided on the overall progress that had been made and any obstacles affecting the implementation of measures.

In 2016, the data and information provided will be on the measures planned for the second cycle of WFD implementation and, as such, may not provide explicit information on the actual progress, success and achievements of the first PoMs. It is intended that Member States provide an update of progress to reflect the actual and expected situation at the start of the second planning cycle.

10.5.2. How will the European Commission and the EEA use the information reported?

The European Commission will use the information reported by Member States to assess the effectiveness of the implementation of the first RBMPs and PoMs in order to assess and report on the overall impact that the WFD is having towards the improvement of water quality at EU level.

Statistics and information will be provided to the European Parliament at EU level. Information will be provided to the public through WISE.

10.5.3. Contents of 2016 reporting

10.5.3.1. Schema sketch

See Annex 10.7.

10.5.3.2. Information and data to be reported using the schemas

For each RBD, report the following information.

Schema: RBMPPoM (continued)
Class: Progress

Properties: *maxOccurs =1 minOccurs = 1*
Schema element: rbmpGeneralProgress **Field type / facets:** String4000Type **Properties:** maxOccurs = 1 minOccurs = 0 **Guidance on completion of schema element:** Optional. Report a brief description of the progress achieved since the first RBMP, in particular on the reduction of pressures achieved and measures taken.
Schema element: financeSecured **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether a clear financial commitment (e.g. approved budget or financial mechanism by the Parliament, Ministry of Finance or other financial responsible authority) was secured for the implementation of the PoMs.
Schema element: financeSecuredAgriculture **Field type / facets:** YesNoNotApplicable_Union_Enum: Yes, No, Not applicable **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Has a clear financial commitment been secured for the implementation of the PoMs in the following sector: agriculture? If the measures for this sector are not relevant in the RBD report 'Not applicable'.
Schema element: financeSecuredIndustry **Field type / facets:** YesNoNotApplicable_Union_Enum: Yes, No, Not applicable **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Has a clear financial commitment been secured for the implementation of the PoMs in the following sector: industry? If the measures for this sector are not relevant in the RBD report 'Not applicable'.
Schema element: financeSecuredUrban **Field type / facets:** YesNoNotApplicable_Union_Enum: Yes, No, Not applicable **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Has a clear financial commitment been secured for the implementation of the PoMs in the following sector: urban development? If the measures for this sector are not relevant in the RBD report 'Not applicable'.
Schema element: financeSecuredTransport **Field type / facets:** YesNoNotApplicable_Union_Enum: Yes, No, Not applicable **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Has a clear financial commitment been secured for the implementation of the PoMs in the following sector: transport? If the measures for this sector are not relevant in the RBD report 'Not applicable'.

Schema element: financeSecuredHydropower **Field type / facets:** YesNoNotApplicable_Union_Enum: Yes, No, Not applicable **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Has a clear financial commitment been secured for the implementation of the PoMs in the following sector: hydropower? If the measures for this sector are not relevant in the RBD report 'Not applicable'.
Schema element: financeSecuredEnergy **Field type / facets:** YesNoNotApplicable_Union_Enum: Yes, No, Not applicable **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Has a clear financial commitment been secured for the implementation of the PoMs in the following sector: energy (non-hydropower)? If the measures for this sector are not relevant in the RBD report 'Not applicable'.
Schema element: financeSecuredAquaculture **Field type / facets:** YesNoNotApplicable_Union_Enum: Yes, No, Not applicable **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Has a clear financial commitment been secured for the implementation of the PoMs in the aquaculture sector? If the measures for this sector are not relevant in the RBD report 'Not applicable'.
Schema element: financeSecuredRecreation **Field type / facets:** YesNoNotApplicable_Union_Enum: Yes, No, Not applicable **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Has a clear financial commitment been secured for the implementation of the PoMs in the recreation sector? If the measures for this sector are not relevant in the RBD report 'Not applicable'.
Schema element: financeSecuredFloodProtection **Field type / facets:** YesNoNotApplicable_Union_Enum: Yes, No, Not applicable **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Has a clear financial commitment been secured for the implementation of the PoMs in the flood protection sector? If the measures for this sector are not relevant in the RBD report 'Not applicable'.
Schema element: newRegulation **Field type / facets:** NewRegulation_Enum: Yes, already adopted Yes, in progress Yes, but not started

No **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether new legislation or regulations were required to implement the PoMs in the first cycle.
Schema element: statusImplementationPoM **Field type / facets:** StatusImplementationPoM_Enum: All planned measures started Some planned measures started Some measures completed All measures completed No measures started **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Select the description from the enumeration list which best describes the level of implementation of the first cycle of PoMs in the RBD.
Schema element: improvementInStatusGeneral **Field type / facets:** ImprovementInStatusGeneral_Enum: As described in the RBMP Less than described in the RBMP Greater than expected in the RBMP **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Select the expected or actual improvement in general in the overall status of water bodies at the end of the first planning cycle from the enumeration list.
Schema element: improvementsInStatusEcologicalSWB **Field type / facets:** ImprovementInStatusGeneral_Enum: As described in the RBMP Less than described in the RBMP Greater than expected in the RBMP **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Select the expected or actual improvement in the ecological status or potential of surface water bodies at the end of the first planning cycle from the enumeration list.
Schema element: improvementsInStatusChemicalSWB **Field type / facets:** ImprovementInStatusGeneral_Enum: As described in the RBMP

Less than described in the RBMP Greater than expected in the RBMP **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Select the expected or actual improvement in the chemical status of surface water bodies at the end of the first planning cycle from the enumeration list.
Schema element: improvementsInStatusQuantitativeGWB **Field type / facets:** ImprovementInStatusGeneral_Enum: As described in the RBMP Less than described in the RBMP Greater than expected in the RBMP **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Select the expected or actual improvement in the quantitative status of groundwater bodies at the end of the first planning cycle from the enumeration list.
Schema element: improvementsInStatusChemicalGWB **Field type / facets:** ImprovementInStatusGeneral_Enum: As described in the RBMP Less than described in the RBMP Greater than expected in the RBMP **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Select the expected or actual improvement in the chemical status of groundwater bodies at the end of the first planning cycle from the enumeration list.
Schema element: obstaclesGovernance **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Have governance issues presented an obstacle to the implementation of the PoMs?
Schema element: obstaclesDelays **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Have unexpected planning delays presented an obstacle to the implementation of the PoMs?
Schema element: obstaclesLackOfFinance **Field type / facets:** YesNoCode_Enum: Yes, No

Properties: maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Has a lack of finance presented an obstacle to the implementation of the PoMs?
Schema element: obstaclesLackOfMechanism **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Has the lack of a mechanism for implementing measures (e.g. national regulations not yet adopted) presented an obstacle to the implementation of the PoMs?
Schema element: obstaclesLackOfMeasures **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Has a lack of effective measures presented an obstacle to the implementation of the PoMs?
Schema element: obstaclesNotCostEffective **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Have some planned measures no longer being considered to be cost effective presented an obstacle to the implementation of the PoMs?
Schema element: obstaclesExtremeEvents **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Have any unexpected extreme events presented an obstacle to the implementation of the PoMs?
Schema element: obstaclesOther **Field type / facets:** String100Type **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element:** Optional. Report if other obstacles were encountered in the implementation of the PoMs. More than one other obstacle may be reported in the same string.
Schema element: measuresFromFirstProgrammeReference **Field type / facets:** ReferenceType (see Annex 9) **Properties:** maxOccurs = unbounded minOccurs = 1 **Guidance on completion of schema element**: Required. Provide references or hyperlinks to documents and sections that contain more information on the progress and achievements of the programme of measures from the first planning cycle. Guidance on what should be included in this document is provided in Section 10.5.3.3.

10.5.3.3. Guidance on the contents of RBMPs/background documents

The following provides guidance on the aspects that the European Commission expects to find in the relevant chapters on progress in the implementation of PoMs in the RBMPs or in background documents. This guidance is not intended to be comprehensive in terms of what the Member States have to include in their RBMPs or background documents, rather to provide certain concrete elements of information that the European Commission expects to find.

The actual and expected outcomes of the first RBMP and PoM should be provided, and how these outcomes have or might affect the planning for the second cycle (see WFD Annex VII Part B). This information may be provided in separate documents specifically produced by the Member State or might be included as a separate chapter or Annex of the second RBMP.

Specific information is required on:

- How a financial commitment has been secured for the planned PoMs, and whether there are shortcomings in terms of the funding of measures for particular sectors? What were the mains sources of funding for implemented measures?

- The success, or otherwise, in implementing any new legislation or regulations required for the implementation of the planned measures. What were the main sectors requiring new legislation or regulations and what was the state of implementation of any new required legislation or regulations at the end of the first planning cycle?

- The status of the planned measures expected at the end of the first planning cycle. If all measures had not been made operational within the planning period, what were the main sectors and measures affected?

- What has been the experience gained over the first planning cycle on the effectiveness of measures in improving the status of water bodies? Were measures effectively targeted at the significant pressures, and what were the differences in the effectiveness of measures between sectors and water categories?

- What were the obstacles encountered in the implementation of the PoM?

- What were the main achievements and failures of the first planning cycle in terms of, for example, achieving or exceeding the objectives of the first RBMP, and the improvements in status of water bodies?

- How have measures planned for 2009-2015 but which were not fully implemented or made operational been transferred to the 2015-2021 PoM, in relation to the key measures and/or sectors affected, and the main factors explaining this position.

11. Reporting at RBD/Sub-unit level for economic analysis and cost recovery (schema RBMPPoM)

11.1. Introduction

Article 5 of the WFD requires Member States to undertake an economic analysis of water uses according to the specifications of Annex III. Article 13 and Annex VII required Member States to send summary reports of the analyses required under Article 5 and Annex II as part of the first RBMP.

Annex III of the WFD stipulates that the economic analysis of water uses should contain enough information in sufficient detail (taking account of the costs associated with collection of relevant data) in order to:

- Make the relevant calculations necessary for taking into account the principle of recovery of the costs of water services under Article 9, taking into account long term forecasts of supply and demand for water in the RBD and where necessary:
    - Make estimates of the volume, prices and costs associated with water services.
    - Make estimates of the relevant investment including forecasts of such investments.
- Make judgments about the most cost-effective combination of measures with respect to water uses to be included in the PoMs under Article 11, based on estimates of the potential costs of such measures.

The WFD is the first EU environmental policy that explicitly integrates economic principles (e.g. polluter-pays-principle), economic tools and methods (e.g. cost-effectiveness analysis), and economic instruments (e.g. environmental charges and taxes) into a piece of EU water legislation. This is based on the understanding that economic principles and instruments are potentially important tools in managing the pressures that affect Europe's waters.

Article 9 of the WFD[133] sets out three general concepts that are closely related but not equivalent, each one imposing specific requirements on economics in general and water pricing schemes specifically:

- Incentive pricing deals with the way water users pay for their use and whether the right price signals are transmitted, i.e. it addresses the question how water is being paid for and how the water price affects the behaviour of water users.

[133] These central principles are set out in Article 9 in WFD as followfollows: Member States shall ensure by 2010 that: 1) water-pricing policies provide adequate incentives for users to use water resources efficiently, and thereby contribute to the Environmental Objectives of this Directive; 2) An adequate contribution of the different water uses disaggregated into at least industry, households and agriculture, to the recovery of the costs of water services based on the economic analysis conducted according to Annex III and taking account of the polluter pays principle; 3) Member States may in so doing have regard to the social environmental and economic effects of the recovery as well as the geographic and climatic conditions of the region or regions affected.

- The polluter-pays-principle establishes how environmental costs should be covered among economic agents, i.e. it considers the adequacy of contributions from different agents based on their role in causing these costs.

- Cost recovery establishes the overall amount that users are charged for water services. The WFD foresees an adequate degree of recovery, not only to the financial costs for the provision of a water service but also of the costs of associated negative environmental effects (environmental costs) as well as forgone opportunities of alternative water uses (resource costs).

The scope of the definition of water services is not fixed, but reflects the activities which result in significant pressures to water bodies in individual Member States.[134] It should be clear that, for the purpose of reporting, Member States are expected to report on that basis and, for those activities which are not subject to cost recovery, a justification should be reported on the basis of Article 9(4). This is in line with the general Union principle of transparency embodied in the Directive via public information and consultation (Article 14) and the need to justify derogations from general rules, while at the same time respecting Member States' margin of discretion in relation to setting programmes of measures under Article 11.

11.1.1. How will the European Commission and the EEA use the information reported?

The European Commission will use this information to ensure that Member States have carried out an economic analysis consistent with the requirements of Article 5 and Annex III of the WFD, and also that the provisions of Article 9 of the WFD have been properly and consistently applied A screening assessment will be based on the three main elements of Article 9: i) incentive pricing; ii) adequate cost-recovery; and iii) the polluter-pays-principle.

In addition, gaps in information identified by Member States will help the European Commission to take further action and to plan activities for strengthening the knowledge base so as to support Member States in their future implementation of Article 9.

Statistics and information will be provided to the European Parliament at EU level. Information will be provided to the public through WISE.

11.2. Contents of the 2016 reporting

11.2.1. Schema sketch

See Annex 10.7.

11.2.2. Information and data to be reported using the schemas

Schema: RBMPPoM (continued)

[134] See judgment of the Court of Justice (11 September 2014) in case C-525/12, *Commission v Germany*, paragraphs 54-58: http://curia.europa.eu/juris/document/document.jsf?text=&docid=157518&pageIndex=0&doclang=EN&mode=lst&dir=&occ=first&part=1&cid=90467.

Class: EconomicAnalysis *Properties: maxOccurs = 1 minOccurs = 1*
Schema element: updatedEconomicAnalysis Field type / facets: YesNoPartially_Union_Enum: Yes No Partially Properties: maxOccurs =1 minOccurs = 1 Guidance on completion of schema element: Required. Indicate whether the 2005 economic analysis of water use has been updated.
Schema element: economicAnalysisReference Field type / facets: ReferenceType (see Annex 9) Properties: maxOccurs =unbounded minOccurs = 0 Guidance on completion of schema element: Conditional. Provide references or hyperlinks to the documents and sections where relevant information on the updated economic analysis can be found. Guidance on what should be included in this document is provided in Section 11.2.3. Quality checks: Conditional check: Report if updatedEconomicAnalysis is 'Yes' or 'To a certain extent'.
Schema element: costEffectiveness Field type / facets: CostEffectiveness_Enum: No Quantitative Qualitative Combination Properties: maxOccurs =1 minOccurs = 1 Guidance on completion of schema element: Required. Indicate whether a cost-effectiveness analysis has been carried out for supporting the selection of measures proposed under the 2015-2021 PoM, and the general type of assessment carried out.
Schema element: costEffectivenessReference Field type / facets: ReferenceType (see Annex 9) Properties: maxOccurs =unbounded minOccurs = 0 Guidance on completion of schema element: Conditional. Provide references or hyperlinks to the documents and sections where relevant information on the cost effectiveness can be found. Guidance on what should be included in this document is provided in Section 11.2.3. Quality checks: Conditional check: Report if costEffectiveness is 'Quantitative', 'Qualitative' or 'Combination'.

Schema element: serviceArticle94DrinkingWater **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Has WFD Article 9(4) been applied to drinking water abstraction (surface and/or groundwater), treatment and distribution?
Schema element: serviceArticle94Wastewater **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Has WFD Article 9(4) been applied to sewage collection and wastewater treatment?
Schema element: serviceArticle94Irrigation **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Has WFD Article 9(4) been applied to irrigation water abstraction, treatment and distribution?
Schema element: serviceArticle94Selfabstraction **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Has WFD Article 9(4) been applied to self-abstraction?
Schema element: serviceArticle94WaterStorage **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Has WFD Article 9(4) been applied to impoundment and storage of water?
Schema element: serviceArticle94FloodProtection **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 1 **Guidance on completion of schema element**: Required. Has WFD Article 9(4) been applied to impoundment for flood protection?
Schema element: serviceArticle94Navigation **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs = 1 minOccurs = 1

Guidance on completion of schema element: Required. Has WFD Article 9(4) been applied to impoundment for navigation?
Schema element: serviceArticle94Other **Field type / facets:** String1000Type **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Report if Article 9(4) is applied to any water service or water service-use combination not covered in the previous questions. More than one other water service or water service-use combination may be reported in the same string. If Article 9(4) is not applied to any other water service or water service-use combination, you should report "None".
Schema element: serviceArticle94Reference **Schema element:** ReferenceType (see Annex 9) **Properties:** maxOccurs =unbounded minOccurs = 0 **Field type / facets:** Reference structure (see Annex 9) (1-∞) **Guidance on completion of schema element:** Conditional. Provide references or hyperlinks to the documents and sections where justification on the use of Article 9(4) can be found. Guidance on what should be included in this document is provided in Section 11.2.3. **Quality checks:** Conditional check: Report if any of the elements serviceArticle94... is 'Yes'.
Schema element: costRecoveryReference **Field type / facets:** ReferenceType (see Annex 9) **Properties:** maxOccurs =unbounded minOccurs = 1 **Guidance on completion of schema element**: Required. Provide references or hyperlinks to documents and sections where specific information on the application of cost recovery can be found. Guidance on what should be included in this document is provided in Section 11.2.3.

The following class is used to report information for each water service (for which Article 9(4) is not applied).

Schema: RBMPPoM (continued)
Class: Service ***Properties:*** *maxOccurs = unbounded minOccurs = 1*
Schema element: service **Field type / facets:** ServiceType_Enum: Drinking water abstraction (surface and/or groundwater), treatment and distribution Sewage collection and wastewater treatment Drinking water abstraction (surface and/or groundwater), treatment and distribution AND sewage collection and wastewater treatment (when considered together)

Irrigation water abstraction, treatment and distribution Self-abstraction Impoundment and storage of water Impoundment for flood protection Impoundment for navigation Other **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Select the water services that exist and are recognised in the Member State from the enumeration list. More than one water service may be selected. Select 'Other' for any water services not included in the enumeration list or if the Member State prefers to report on the basis of water service-use combinations. A description of the water service or water service-use combination should be reported in serviceOther. The remaining schema elements should be reported for each water service.
Schema element: serviceOther **Field type / facets:** String1000Type **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. If 'Other' is selected from the enumeration list in Service, describe the water service or the water service-use combination. More than one other water service or water service-use combination may be reported. The remaining schema elements should be reported for each water service or water service-use combination. **Quality checks**: Conditional check: Report if service is 'Other'.
Schema element: serviceCostInstrument **Field type / facets:** YesNoPartially_Union_Enum: Yes, No, Partially **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether there are legal or regulatory instruments which require cost recovery for this water service.
Schema element: serviceCostInstrumentReference **Field type / facets:** ReferenceType (see Annex 9) **Properties:** maxOccurs =unbounded minOccurs = 0 **Guidance on completion of schema element**: Conditional. Provide references or hyperlinks to documents and sections where specific information on the legal instruments implementing cost recovery for this water service can be found. Guidance on what should be included in this document is provided in Section 11.2.3. **Quality checks**: Conditional check: Report if serviceCostInstrument is 'Yes' or 'Partially'.
Schema element: serviceVolumetricCharges

Field type / facets: YesNoPartially_Union_Enum: Yes, No, Partially

Properties: maxOccurs =1 minOccurs = 1

Guidance on completion of schema element: Required. Indicate whether cost recovery for this water service is based on volumetric charges (i.e. users paying in proportion to the measured use of water).

Schema element: servicePriceLevel

Field type / facets: String10Type

Properties: maxOccurs =1 minOccurs = 1

Guidance on completion of schema element: Required. In case of volumetric charges (serviceVolumetricCharges is 'Yes' or 'Partially'), report the average or range of price levels for this water service in euros per m3.

In case volumetric charges are not in place (serviceVolumetricCharges is 'No'), report the estimated average price in euros per m3 by dividing the overall revenue by the quantity of water delivered. In case this is unknown report 'Not available'.

Schema element: serviceFinancialCostIncluded

Field type / facets: YesNoPartially_Union_Enum: Yes, No, Partially

Properties: maxOccurs =1 minOccurs = 1

Guidance on completion of schema element: Required. Indicate whether financial costs (investment, operation and maintenance, other financial costs including the costs of capital) are included in the cost recovery for this water service.

Schema element: serviceFinancialCostCalculation

Field type / facets: YesNoPartially_Union_Enum: Yes, No, Partially

Properties: maxOccurs =1 minOccurs = 1

Guidance on completion of schema element: Required. Indicate whether the economic analysis includes the calculation of the total financial costs (investment, operation and maintenance, other financial costs including the costs of capital) per year.

Schema element: serviceFinancialCostRecovery

Field type / facets: NumberDecimalType

Properties: maxOccurs =1 minOccurs = 1

Guidance on completion of schema element: Required. Report the overall recovery of total financial costs (investment, operation and maintenance, other financial costs including the costs of capital) as a percentage of total financial costs for this water service. Report -9999 if this information is not available.

Quality checks: Element check: Report -9999 if information on cost recovery is not available.

Schema element: serviceEnvironmentalCharge

Field type / facets: YesNoCode_Enum: Yes, No

Properties: maxOccurs =1 minOccurs = 1

Guidance on completion of schema element: Required. Indicate whether an environmental charge

or tax is applied for this water service.
Schema element: serviceEnvironmentalChargeRevenues **Field type / facets:** NumberDecimalType **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. If an environmental charge or tax is applied to this water service, report the total revenue from the environmental charge or tax applied (in millions € or total € per year). Report whether the total revenue is provided in millions € or total € per year in serviceEnvironmentalChargeRevenuesUnits. **Quality checks**: Conditional check: Report if serviceEnvironmentalCharge is 'Yes'.
Schema element: serviceEnvironmentalChargeRevenuesUnits **Field type / facets:** RevenuesUnits_Enum: millions € total € per year **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. Report whether the total revenue reported in serviceEnvironmentalChargeRevenues is provided in millions € or total € per year. **Quality checks**: Conditional check: Report if serviceEnvironmentalCharge is 'Yes'.
Schema element: serviceEnvironmentalChargeRevenuesUse **Field type / facets:** YesNoPartially_Union_Enum: Yes, No, Partially **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. If an environmental charge or tax is applied to this water service, indicate whether the revenues obtained are dedicated to measures linked to the achievement of the WFD Environmental Objectives. **Quality checks**: Conditional check: Report if serviceEnvironmentalCharge is 'Yes'.
Schema element: serviceExternalEnvironmentalResourceCost **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 1 **Guidance on completion of schema element**: Required. Indicate whether the economic analysis includes calculation of external environmental and resource costs for this water service.
Schema element: serviceExternalEnvironmentalResourceCostSignificance **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. Indicate whether the environmental and resource costs are considered significant for this water service. **Quality checks**: Conditional check: Report if serviceExternalEnvironmentalResourceCost is 'Yes'.

Schema element: serviceExternalEnvironmentalResourceCostInternalisation **Field type / facets:** YesNoPartially_Union_Enum: Yes, No, Partially **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. If the environmental and resource costs are considered significant for this water service, indicate whether the environmental and resource costs are already considered internalised through the available instruments. **Quality checks**: Conditional check: Report if serviceExternalEnvironmentalResourceCostSignificance is 'Yes'.
Schema element: serviceExternalEnvironmentalResourceCostJustification **Field type / facets:** String2500Type **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. Provide a justification of why environmental and resource costs for this water service they are not considered significant and/or are internalised. **Quality checks**:Conditional check: Report if serviceExternalEnvironmentalResourceCostSignificance is 'No' or serviceExternalEnvironmentalResourceCostInternalisation is 'No' or 'Partially'.
Schema element: serviceWaterUseHouseholds **Field type / facets / relationship**: YesNoNotApplicable _Enum: Yes, No, Not applicable **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element:** Conditional. Are households benefitting from this water service? This element does not need to be reported if the Member State is reporting on the basis of a water service-use combination as indicated by reporting 'Other' in service and providing further information in serviceOther. **Quality checks**: Element check: A valid option must be selected from the enumeration list. Conditional check: Report if service is not 'Other' and serviceOther is not null.
Schema element: serviceWaterUseAgriculture **Field type / facets / relationship**: YesNoNotApplicable _Enum: Yes, No, Not applicable **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element:** Conditional. Is agriculture benefitting from this water service? This element does not need to be reported if the Member State is reporting on the basis of a water service-use combination as indicated by reporting 'Other' in service and providing further information in serviceOther. **Quality checks**: Element check: A valid option must be selected from the enumeration list. Conditional check: Report if service is not 'Other' and serviceOther is not null.
Schema element: serviceWaterUseIndustry

Field type / facets / relationship: YesNoNotApplicable _Enum: Yes, No, Not applicable **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element:** Conditional. Is industry benefitting from this water service? This element does not need to be reported if the Member State is reporting on the basis of a water service-use combination as indicated by reporting 'Other' in service and providing further information in serviceOther. **Quality checks**: Element check: A valid option must be selected from the enumeration list. Conditional check: Report if service is not 'Other' and serviceOther is not null.
Schema element: serviceWaterUseOther **Field type / facets / relationship**: String1000Type **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element:** Optional. If other use than households, agriculture and industry is benefitting from this water service please describe it. More than one other water use may be reported in this field. **Quality checks**: Element check: String length must be a maximum of 1000 characters.
Schema element: serviceWaterUseContribution **Field type / facets:** YesNoCode_Enum: Yes, No **Properties:** maxOccurs =1 minOccurs = 0 **Guidance on completion of schema element**: Conditional. If the water service is relevant for more than one water use (considering as a minimum households, agriculture and industry), indicate whether the economic analysis includes calculations relating to the contribution of each of the water uses to the cost recovery of water services. **Quality checks**: Conditional check: Report if more than one water use is reported as Yes in serviceWaterUseHouseholds, serviceWaterUseAgriculture, serviceWaterUseIndustry and/or serviceWaterUseOther.

11.2.3. Guidance on the contents of RBMPs/Background documents

The following provides guidance on the aspects that the European Commission expects to find in the relevant chapters on economic analysis in the RBMPs or in background documents. This guidance is not intended to be comprehensive in terms of what the Member States have to include in their RBMPs or background documents, rather to provide certain concrete elements of information that the European Commission expects to find.

The RBMP or background documents must make clear reference to the methodology applied in the context of the updated economic analysis of water services and uses in particular for supporting the implementation of Article 9 and the calculation of cost recovery levels. This should include:

- The assessments made for updating the economic analysis of water uses.
- The methods applied for performing the cost-effectiveness analysis to support the selection of measures.

- The water services selected, and the rationale for supporting this selection.
- The assessments made for estimating the financial costs of water services, specifying in particular how subsidies allocated to water services (if any) have been accounted for when assessing these costs.
- For each selected water service, the total financial costs (investment, operation and maintenance, other financial costs including the costs of capital) per year.
- The methodology for assessing environmental and resource costs.
- The methodology applied for assessing cost-recovery levels for individual water services.
- Description of the instruments in place to recover costs, including water charges, environmental taxes, etc.
- The assessments made for justifying that the contribution of different water uses (agriculture, households, industry, others) to the costs of water services is 'adequate'.
- The assessments made to justify that water-pricing policies provide adequate incentives for users to use water resources efficiently.
- The methodology used for taking account of the social, environmental and economic effects of the cost recovery as well as the geographic and climatic conditions of the region or regions affected when implementing Article 9.
- If applied, justification for the application of WFD Article 9(4).
- If diffuse pollution from agriculture is identified as a significant pressure on the aquatic environment, provide information on:
    - The estimated cost of measures to counteract the impact of diffuse pollution (in €/year or €/cycle).
    - The proposed additional contribution of agriculture to the recovery of costs of diffuse pollution (additional to financing costs of measures), e.g. taxes, fees on fertilisers, pesticides etc. Provide details on the tools and indicate the revenue collected.
    - Specify whether diffuse pollution from agriculture imposes additional financial cost on the water service providers (e.g. for the removal of nitrates). If so, specify whether those costs have been estimated.

12. FUTURE DEVELOPMENTS IN REPORTING

The new requirements for electronic reporting were adopted in June 2014 by the European Water Directors. The requirements and guidance provided at European level (e.g. the current request for future reporting but also the work programme INSPIRE Maintenance and Implementation) incorporate the requirements for simplification, streamlining and standardisation of data provision

in line with INSPIRE. There are a number of environmental policies, for which the dependencies and usage of INSPIRE data should be clarified in relation to reporting obligations.

12.1. Targets for the third planning cycle

The principles of the Shared Environmental Information System (SEIS) establish that the reporting of data and information should be:

- Managed as close as possible to its source.
- Collected once and shared with others for many purposes.
- Readily available to easily fulfil reporting obligations.
- Readily accessible to end-users at all levels for the design of new policies.
- Accessible to enable comparisons of the environment at the appropriate geographic scale.
- Fully available to the general public, to enable citizen participation.
- Supported through common, free and open software standards.

The new reporting system will take advantage of the possibilities provided by information and communication technology to put into practice the principle 'monitor once for timely and multi-purpose uses'. In a decentralised reporting system, the Member States are responsible and in control of information and data on national websites. Information and data could be shared with users at EU, national and regional levels. The new reporting system for environmental data must act on different administrative levels. It should integrate the access to a large amount of heterogeneous and geographically distributed information. The European Commission could extract the information and data for compliance checking without having to collect and store the data itself.

The cross-linking of the requirements of INSPIRE and the water-related policies must be visible. An important aspect of a common reporting is a uniform definition of terms to keep in use. A practicable option is to identify a common data definition that can be accommodated in a common ontology. These are essential parts of the INSPIRE work programme, which is therefore to be considered in the implementation. The INSPIRE work programme (WP) based on feedback submitted by the INSPIRE stakeholders in the Member States includes:

INSPIRE Work programme

- MIWP-1: Improve accessibility and readability of TG
- MIWP-2: Create and maintain FAQ page
- MIWP-3: Guidelines and best practices for access control
- MIWP-4: Managing and using http URIs for INSPIRE identifiers

- MIWP-5: Validation and conformity testing
- MIWP-6: Registries and registers
- MIWP-7: Extension of Download Service TG for observation, coverage and tabular data
- MIWP-8: Update of Metadata TG
- MIWP-9: Future directions for INSPIRE geoportal
- MIWP-10: Update Annex I data specifications
- MIWP-11: Simplification and clarification of GML encoding for spatial data
- MIWP-12: Clarification of UML-to-GML encoding rules
- MIWP-13: Theme specific issues on data specifications
- MIWP-14: Exchange of implementation experiences in thematic domains
- MIWP-15: Overview of INSPIRE coordinating structures, architectures and tools
- MIWP-16: Improve usefulness and reliability of monitoring information
- MIWP-17: Data and service sharing & licencing models
- MIWP-18 XML schema maintenance
- MIWP-19 Explore and improvement on the situation of controlled vocabularies in the framework of INSPIRE
- MIWP-20: Improved guidelines for harmonised layer names
- MIWP-21: Pilots for INSPIRE-based applications (including for e-reporting)

For example, work programmes 6, 13 and 17:

INSPIRE work programme 6: Registries and registers

Member States need to build registries to implement INSPIRE (and use the central INSPIRE registers). A technical guideline should explain how to build them, how to extend central INSPIRE registers and how to link national registers/extensions to the central INSPIRE registry.

The priorities for the further development (functionality and content) of the central INSPIRE registry should be discussed between the European Commission and the Member States. Possible topics include:

- Support for registration of mapping between code lists.
- Support for registration of extended models and code lists.
- Inclusion of updated feature concept dictionary (including Annex II+III).

- Agreement on how to address CRS register in INSPIRE.

INSPIRE work programme 13: Theme specific issues on data specifications

A number of theme-specific issues have been raised for the data specifications of PS, AD, EL, US, TN, BU, CRS and HY (see below for explanation of abbreviations).

This includes PS (Full application schema) which needs to be brought in line with Annex III themes and has therefore temporarily been removed from the updated PS data specification (see MIWP-10).

List of abbreviations

AD	Addresses
AU	Administrative Units
AF	Agricultural and Aquaculture Facilities
AM	Area Management Restriction Regulation Zones and Reporting units
AC	Atmospheric Conditions
BR	Bio-geographical Regions
BU	Buildings
CP	Cadastral Parcels
CRS	Coordinate reference systems
EL	Elevation
ER	Energy Resources
EF	Environmental Monitoring Facilities
GCM	Generic Conceptual Model
GG	Geographical grid systems
GN	Geographical Names
GE	Geology
HB	Habitats and Biotopes
HH	Human Health and Safety
HY	Hydrography
LC	Land Cover

LU	Land Use
MF	Meteorological geographical features
MR	Mineral Resources
NZ	Natural Risk Zones
OF	Oceanographic Geographical Features
OI	Orthoimagery
PD	Population Distribution - Demography
PF	Production and Industrial Facilities
PS	Protected Sites
SR	Sea Regions
SO	Soil
SD	Species Distribution
SU	Statistical Units
TN	Transport Networks
US	Utility and Governmental Services

INSPIRE work programme 17: Data and service sharing & licencing models

The basic requirements for data and service sharing are already defined in the INSPIRE Directive (2007/2/EC)[135] Article 17. This Article provides also the basis for the Implementing Rule - COMMISSION REGULATION (EU) No 268/2010 of 29 March 2010 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards the access to spatial data sets and services of the Member States by Community institutions and bodies under harmonised conditions[136]. In addition to the legal basis, two supporting documents are available[137]: (1) guidelines to the Commission Regulation by promoting the INSPIRE licencing models and (2) good practice document on implemented licencing approaches and models.

There is a wide variety of approaches on data and service sharing arrangements across Member States. The overview of such arrangements are provided in the INSPIRE country reports every 3 years. The constraints related to access and use of spatial data sets and services (conditions

[135] http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32007L0002&qid=1440768207625&from=EN

[136] http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32010R0268&qid=1440768290721&from=EN

[137] See: http://inspire.ec.europa.eu/index.cfm/pageid/2

applying to access and use, limitations on public access) should also be provided in metadata for spatial data sets and services based on the INSPIRE Metadata Regulation.

The users as well as data and service providers need a clear understanding of the conditions to share, access and use spatial data sets and services. The data and service sharing could also benefit from the standardisation of licences, the use of technology (for example, machine readable licences, electronic authentication and authorisation) and the reduction of other barriers expressed by the countries in their country reports.

The proposed actions are focused on the data and service providers' and users' (stakeholders) needs, standardisation and awareness raising about the licencing approaches.

The implementation of a new reporting system that respects the principles of accessibility and sharing implies a requirement for information systems capable of delivering information for many purposes, at various geographic scales and tailored to the needs of the public and of various public authorities. At all levels (local, regional, national and European), interoperability in all its perspectives (technical, semantic, organisational and legal) is an essential condition to achieving accessibility and usability of information and to ensure an adequate and efficient flow of information. Solutions at the European level should build upon existing interoperability solutions (ISA programme and its actions[138]).

The reporting requirements are specified in the following water-related directives and in other legislation:

2003/4/EC Public Access to Environmental Information[139]

The objectives of this Directive are to guarantee the right of access to environmental information and to set up the basic terms and conditions of, and practical arrangements for, its exercise; and to ensure that environmental information is progressively made available and disseminated to the public in order to achieve the widest possible systematic availability and dissemination of environmental information to the public. To this end, the use of computer telecommunication and/or electronic technology, where available, shall be promoted.

2003/35/EC Public Participation and access to justice [140]

The objective of this Directive is to contribute to the implementation of the obligations arising under the Aarhus Convention, in particular by:

(a) Providing for public participation in drawing up certain plans and programmes related to the environment.

138 http://ec.europa.eu/isa/index_en.htm

139 http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32003L0004&qid=1440768565703&from=EN

140 http://eur-lex.europa.eu/resource.html?uri=cellar:4a80a6c9-cdb3-4e27-a721-d5df1a0535bc.0004.02/DOC_1&format=PDF

(b) Improving the public participation and providing for provisions on access to justice within Council Directives 85/337/EEC and 96/61/EC.

2003/98/EC Re-use of Public Sector Information[141]

This Directive establishes a minimum set of rules governing the re-use and the practical means of facilitating reuse of existing documents held by public sector bodies of the Member States. There are, however, some exemptions, for instance, documents held by cultural establishments, museums, libraries, archives, orchestras, operas, ballets and theatres. According to the Directive, citizens or companies do not have to prove a particular interest under the access regime to obtain access to the documents.

2007/2/EC Infrastructure for Spatial Information in the European Community[142]

In May 2007, a major recent development entered into force establishing an infrastructure for spatial information in Europe to support Community environmental policies, and policies or activities which may have an impact on the environment. The Directive requires that common Implementing Rules (IR) are adopted in a number of specific areas such as: Metadata, Data Specifications, Network Services, Data and Service Sharing and Monitoring and Reporting.

12.2. Classification and evolution of the provision of INSPIRE-compliant datasets

Member States require a modern, efficient and user friendly new reporting system to fulfil their reporting obligations related to EU environmental policies and legislation, avoiding duplication of efforts, overlapping and redundancies. At all levels (local, regional, national and European) interoperability in all its perspectives (technical, semantic, organisational and legal) is an essential condition to achieving accessibility and usability of information and to ensure an adequate and efficient flow of information. Solutions at the European level should build upon existing interoperability solutions.

It is important to consider extensibility as one of the main concerns of a new reporting design, as it is more than probable that the needs for information processing will increase. INSPIRE provides the framework for a distributed information system, linked by common standards and protocols to ensure compatibility and interoperability. INSPIRE will be the core model and the environmental directives will add the data specifications.

[141] http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32003L0098&qid=1440768720846&from=EN

[142] http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32007L0002&qid=1440768207625&from=EN

The important aspect of a common reporting mechanism is ultimately to maintain a single definition of terms in use across INSPIRE and the environmental directives. At the organisational level, it is necessary to take into account the reuse and evolution of existing infrastructure in the Member States towards a common reporting scheme.

Environmental information may be expressed in generic indicators or in more specialised indicators. At a European level general indicators should be harmonised. Across national levels, data specifications and specialised indicators should be harmonised within the CIS process (at Member State and European Commission levels), starting from an INSPIRE core level.

The reporting requirements and guidance at European level (e.g. the current request for future reporting but also the work programme INSPIRE Maintenance and Implementation) contain the requirements for simplification, streamlining and standardisation of data provision in line with INSPIRE. There are a number of environmental policies, for which the dependencies and usage of INSPIRE data should be clarified in relation to reporting obligations. New reporting contents must support this gradual process.

ANNEXES

Annex 0: Template for the 'Read me first' explanatory note accompanying the 2016 Water Framework Directive reporting

The explanatory note should be reported as a Word document with the following structure:

Reporting of River Basin Management Plans 2016

Annex 0 – Read-me-first document

(Delete the instructions in [square brackets] and replace them with the relevant information)

MS or RBD	*[Name of the MS or the RBD covered by this explanatory note]*
Contact	*[Name and email of the person(s) acting as a contact point for further information/clarification]*
Introduction	*[Any general information that is deemed useful for the purpose of providing context to the accompanying reporting]*

Please provide explanations about contents that have not been reported despite they are identified in the WFD Reporting Guidance 2016 as required (or conditional and the condition is met).

Reporting guidance chapter/section	Schema elements	Please give a short explanation why this is not reported

Please insert as many rows as needed.

Annex 1: List of Pressure Types, Impact Types and Drivers

Annex 1a: List of Pressure Types (SignificantPressureType_Enum)

Pressure	Main Driver(s)	Description
1.1 - Point – Urban waste water	Urban development	Included or not in the UWWT Directive. Includes discharges from non-manufacturing commercial areas which can largely be assimilated to urban waste water. Includes discharges of raw or partially treated urban waste water which are identified as point sources.
1.2 - Point - Storm overflows	Urban development	Overflows from separated or combined sewers identified as point sources (for diffuse see 'Diffuse – Urban run-off' below).
1.3 - Point - IED plants	Industry	Industrial point sources from plants included in the E-PRTR.
1.4 - Point - Non IED plants	Industry	Any industrial point sources not included in the E-PRTR.
1.5 - Point - Contaminated sites or abandoned industrial sites	Industry	Pollution resulting from an abandoned industrial site or a site contaminated due to past industrial activities, illegal dumping of industrial waste or a pollution accident and which is identified as point source (for diffuse see below 'Diffuse – Contaminated sites or abandoned industrial sites'). This category does not cover existing industrial activities.
1.6 - Point - Waste disposal sites	Urban development	Point sources due to urban or industrial waste disposal sites.
1.7 - Point - Mine waters	Industry	Point sources due to the collection of water in an open pit or underground mine which has to be brought to the surface in order to enable the mine to continue working. It does not include waste water from the industrial processes.
1.8 - Point - Aquaculture	Fisheries and aquaculture	
1.9 - Point – Other		Other point sources not included in the categories above.
2.1 - Diffuse - Urban run-off	Urban development, Industry	Storm overflows and discharges in urbanised areas not identified as point sources
2.2 - Diffuse – Agricultural	Agriculture	
2.3 - Diffuse – Forestry	Forestry	
2.4 - Diffuse – Transport	Transport	Diffuse pollution from road and train traffic, aviation and infrastructure.
2.5 - Diffuse – Contaminated sites or abandoned industrial sites	Industry	Pollution resulting from an abandoned industrial site or a site contaminated due to past industrial activities, illegal dumping of industrial waste or a pollution accident and which is identified as diffuse source (for point see above 'Point – Contaminated sites or abandoned industrial sites'). This category

Pressure	Main Driver(s)	Description
		does not cover existing industrial activities.
2.6 - Diffuse - Discharges not connected to sewerage network	Urban development	Pollution resulting from urban waste water not connected to sewers and identified as a diffuse source.
2.7 - Diffuse - Atmospheric deposition	Agriculture, Energy - non-hydropower, Industry, Transport, Urban development	Diffuse pollution from atmospheric deposition from any origin
2.8 - Diffuse – Mining	Industry	Pollution from mining activities which are identified as diffuse (for point sources see categories above)
2.9 - Diffuse – Aquaculture	Fisheries and aquaculture	
2.10 - Diffuse – Other		Other diffuse sources not included in the categories above.
3.1 – Abstraction or flow diversion – Agriculture	Agriculture	Includes water transfers and abstractions for irrigation and livestock breeding.
3.2 – Abstraction or flow diversion – Public water supply	Urban development	Includes water transfers. Affection to TW and/or CW possible only in case of desalination plants.
3.3 – Abstraction or flow diversion – Industry	Industry	Abstraction for industrial processes (cooling water is covered under the category 'Abstraction or flow diversion – cooling water')
3.4 – Abstraction or flow diversion – Cooling water	Industry, Energy - non-hydropower	
3.5 – Abstraction or flow diversion – Hydropower	Energy - hydropower	
3.6 – Abstraction or flow diversion - Fish farms	Fisheries and aquaculture	Typically off-line fish farms
3.7 – Abstraction or flow diversion – Other	Tourism and recreation	Abstraction for any other purpose not listed above.
4.1.1 - Physical alteration of channel/bed/riparian area/shore - Flood protection	Flood protection	Refers largely to longitudinal alterations to water bodies.
4.1.2 - Physical alteration of channel/bed/riparian area/shore - Agriculture	Agriculture	Refers largely to longitudinal alterations to water bodies. Includes land drainage to enable agricultural activities.
4.1.3 - Physical alteration of channel/bed/riparian area/shore - Navigation	Transport	Refers largely to longitudinal alterations to water bodies.
4.1.4 - Physical alteration of channel/bed/riparian area/shore – Other		Refers largely to longitudinal alterations to water bodies.
4.1.5 - Physical alteration of channel/bed/riparian area/shore – Unknown or obsolete		In case the driver for the physical modification is unknown.
4.2.1 - Dams, barriers and locks - Hydropower	Energy – hydropower	

Pressure	Main Driver(s)	Description
4.2.2 - Dams, barriers and locks - Flood protection	Flood Protection	
4.2.3 - Dams, barriers and locks - Drinking water	Urban development	
4.2.4 - Dams, barriers and locks - Irrigation	Agriculture	
4.2.5 - Dams, barriers and locks - Recreation	Tourism and recreation	Small dams are used in rivers to create recreational areas (bathing waters) and also angling areas
4.2.6 - Dams, barriers and locks - Industry	Industry, Energy - non-hydropower	Dams are sometimes created to provide freshwater for large industry e.g. typically for cooling purposes
4.2.7 - Dams, barriers and locks - Navigation	Transport	
4.2.8 - Dams, barriers and locks – Other		
4.2.9 - Dams, barriers and locks – Unknown or obsolete		
4.3.1 - Hydrological alteration – Agriculture	Agriculture	A change in the flow regime (e.g. due to land drainage).
4.3.2 - Hydrological alteration – Transport	Transport	A change in the flow regime - typically due to inland navigation
4.3.3 - Hydrological alteration – Hydropower	Energy – hydropower	A change in the flow regime (e.g. hydropeaking)
4.3.4 - Hydrological alteration – Public water supply	Urban development	A change in the flow regime
4.3.5 - Hydrological alteration - Aquaculture	Fisheries and aquaculture	A change in the flow regime
4.3.6 - Hydrological alteration – Other		
4.4 - Hydromorphological alteration - Physical loss of whole or part of the water body	Flood protection, Climate change	Dry river beds etc.
4.5 - Hydromorphological alteration - Other		Other hydromorphological alterations not included in any of the categories above, including alteration of water level or volume for purposes not identified above.
5.1 - Introduced species and diseases	Transport, Fisheries and aquaculture, Tourism and recreation.	Includes invasive alien species.
5.2 - Exploitation or removal of animals or plants	Tourism and recreation, Fisheries and aquaculture	Commercial fishing or recreational/sports angling, commercial harvesting of plants or algae from water bodies.
5.3 – Litter or fly tipping	Urban development, Transport	Includes illegal waste deposits, litter from ships, etc. (All waste from land area)
6.1 - Groundwater - Recharges	Agriculture, Energy - non-hydropower, Industry, Urban	

Pressure	Main Driver(s)	Description
	development	
6.2 - Groundwater – Alteration of water level or volume	Industry, Urban development	This category includes activities to alter the level of groundwater in order to carry out an underground activity (typically mining or large civil works). This does not include the alteration of the water level due to current or past overexploitation of the groundwater resources (this case is captured under the categories 'Abstraction' above).
7 - Anthropogenic pressure - Other		Other pressures not included in any other category.
8 - Anthropogenic pressure - Unknown		Only relevant where status is lower than good and pressure is unknown.
9 - Anthropogenic pressure - Historical pollution		In cases where for example a groundwater body is significantly polluted by past activities / pressures that no longer exist.
No significant pressures		
Not applicable		

Annex 1b: List of Impact Types (SignificantImpactType_Enum)

Impact type	Relevant SW	Relevant GW
ACID - Acidification	Y	N
CHEM - Chemical pollution	Y	Y
ECOS - Damage to groundwater-dependent terrestrial ecosystems for chemical / quantitative reasons	N	Y
HHYC - Altered habitats due to hydrological changes	Y	N
HMOC - Altered habitats due to morphological changes (includes connectivity)	Y	N
INTR - Alterations in flow directions resulting in saltwater intrusion	N	Y
LITT - Litter (an impact under the MSFD)	Y	N
LOWT - Abstraction exceeds available groundwater resource (lowering water table)	N	Y
MICR - Microbiological pollution	Y	Y
NOSI - No significant impact	Y	Y
NOTA - Not applicable	Y	Y
NUTR - Nutrient pollution	Y	Y
ORGA - Organic pollution	Y	Y
OTHE - Other significant impact type	Y	Y
QUAL - Diminution of quality of associated surface waters for chemical / quantitative reasons	N	Y
SALI - Saline pollution/intrusion	Y	Y
TEMP - Elevated temperatures	Y	N
UNKN - Unknown impact type	Y	Y

Annex 1c: List of Drivers (Driver_Enum)

Driver	Description
Agriculture	Includes all farming activities, agriculture and livestock
Climate change	
Energy – hydropower	
Energy – non-hydropower	Including cooling activities for thermal and nuclear plants
Fisheries and aquaculture	Commercial fishing and aquaculture (not recreational or sports angling, included in category 'Tourism and recreation' below)
Flood protection	
Forestry	
Industry	All kinds of industry not included under other categories
Tourism and recreation	Includes bathing, leisure boating and sailing, sports fishing/angling. It does not include the urban development linked to tourism (under category 'Urban development').
Transport	Road and rail traffic, shipping, aviation
Urban development	Includes urban development linked to household, non-manufacturing commercial activities, tourism.
Unknown - other	Driver is unknown
Exemption not applied	

Annex 2: Table of Abstraction Pressures in the Context of Water Availability

WFD list of pressures	*driver*	*specification of pressure*	*NACE classes or equivalent in the statistical and SoE reporting*
3.1 - Abstraction or flow diversion – Agriculture	Agriculture	Includes irrigation and livestock breeding.	- Water use, NACE A Agriculture - Water use, for Irrigation ((ref. NACE/ISIC division 01)
3.2 - Abstraction or flow diversion – Public water supply	Urban development	Affection to TW and/or CW possible only in case of desalination plants.	- Water use, NACE I (Services, tourism included) - Water use, any other economic activity - Water use, from public supply - Water use, from self-supply - Water use, from self-supplied for domestic purposes - Reused water - Water use, produced from Desalination process - Water imports - Water exports - Water transfers (intra-RBD)
3.3 - Abstraction or flow diversion – Industry	Industry	Abstraction for industrial processes (cooling water is covered under the category 'Abstraction – cooling water')	- Water use, NACE B (Mining and Quarrying) - Water use, NACE C (Manufacturing Industry) -
3.4 - Abstraction or flow diversion – Cooling water	Industry; Energy - non-hydropower		- Water use, NACE D (Production of Electricity)
3.5 - Abstraction or flow diversion - Hydropower	Energy - hydropower		- Water use, for Hydropower generation
3.6 - Abstraction or flow diversion - Fish farms	Fisheries and aquaculture		- No NACE class
3.7 - Abstraction or flow diversion – Other	Tourism and recreation	Abstraction for any other purpose not listed above.	- Water use, any other economic activity

Annex 3: Significant pressures mapped to indicators, KTMs and KTM indicators

Indicative mapping of significant pressures and chemical substances causing failure of objectives with Key Types of Measures with quantitative indicators of the scale of the pressures to be tackled and the scale of measures planned to achieve WFD Environmental Objectives. Please note that the indicators listed may, in some cases, not have a direct correspondence in the lists of indicators in Annexes 8p and 8r. The indicators to be used should be, in each case, the most appropriate ones, selected from the ones listed in those two annexes. It should also be noted that both annexes include also the option of chosing "other" indicators if none of those listed are appropriate.

Significant pressure or chemical substance failing	Main driver(s)	Indicators for pressure	Relevant KTM	Indicators for KTM
1.1 - Point – Urban waste water	Urban development	Load of BOD to be reduced (in tonnes) to achieve objectives	1 Construction or upgrades of wastewater treatment plants	Population equivalent required to be treated by construction or upgrade of waste water treatment works
		Load of nitrogen to be reduced (in tonnes) to achieve objectives		Number of wastewater treatment works requiring to be constructed or upgraded
		Load of phosphorus to be reduced (in tonnes) to achieve objectives		
		Number of water bodies failing EQS for RBSP		
		Loads of priority substances to be reduced (in tonnes) to achieve objectives	15 Measures for the phasing-out of emissions, discharges and losses of priority hazardous substances or for the reduction of emissions, discharges and losses of priority substances.	Number of new permits to be issued or updated
				Number of installations associated with priority substances requiring measures to achieve objectives
				Number of substances requiring restrictions or bans on uses to achieve objectives

Significant pressure or chemical substance failing	Main driver(s)	Indicators for pressure	Relevant KTM	Indicators for KTM
1.2 - Point - Storm overflows	Urban development	Load of BOD to be reduced (in tonnes) to achieve objectives	1 Construction or upgrades of wastewater treatment plants	Number of Combined Sewer Overflows to be upgraded to achieve objectives
		Number of urban areas with excessive overflows that are causing or contributing to failure of objectives		
		Number of water bodies failing EQS for PS and/or RBSP		
		Load of sediment to be reduced to (in tonnes) to achieve WFD Environmental Objectives.	17 Measures to reduce sediment loads from soil erosion and surface run-off	Number of storm overflows where sediment flow to surface water will be intercepted or reduced.
		Volume of storm water that is causing or contributing to failure of objectives	23 Natural water retention measures	Number of sustainable drainage systems required to achieve objectives
		Number of urban areas with excessive overflows that are causing or contributing to failure of objectives		
1.3 - Point - IED plants	Industry	Number of permits not compatible with the achievement of objectives	16 Upgrades or improvements of industrial wastewater treatment plants (including farms)	Number of installation where upgrades or improvements are required to achieve objectives
		Number of water bodies failing EQS for RBSP		Number of revised permit required to achieve objectives

Significant pressure or chemical substance failing	Main driver(s)	Indicators for pressure	Relevant KTM	Indicators for KTM
		Number of permits not compatible with the achievement of objectives	15 Measures for the phasing-out of emissions, discharges and losses of priority hazardous substances or for the reduction of emissions, discharges and losses of priority substances.	
		Number of water bodies failing EQS for priority substances		Number of substances requiring restrictions or bans on uses to achieve objectives
1.4 - Point - Non IED plants	Industry	Number of permits not compatible with the achievement of objectives	16 Upgrades or improvements of industrial wastewater treatment plants (including farms)	Number of revised permit required to achieve objectives
		Number of water bodies failing EQS for RBSP		
1.5 - Point - Contaminated sites or abandoned industrial sites	Industry	Number of contaminated sites affecting the achievement of objectives	4 Remediation of contaminated sites (historical pollution including sediments, groundwater, soil).	Number of sites to be remediated or where preventative actions are to be taken to achieve objectives
		Number of water bodies failing EQS for PS and/or RBSP		
1.6 - Point - Waste disposal sites	Urban development	Number of waste disposal sites affecting achievement of objectives	21 Measures to prevent or control the input of pollution from urban areas, transport and built infrastructure	Number of upgraded or remediated waste disposal sites required to achieve objectives
		Number of water bodies failing EQS for PS and/or RBSP		Number of water bodies affected by measures

Significant pressure or chemical substance failing	Main driver(s)	Indicators for pressure	Relevant KTM	Indicators for KTM
1.7 - Point - Mine waters	Industry	Number of mine water discharges affecting achievement of objectives Number of water bodies failing EQS for PS and/or RBSP	New MS KTM	Number of mine discharges for which measures are required to achieve objectives
1.8 - Point - Aquaculture	Fisheries and aquaculture	Number of point sources affecting achievement of objectives Number of water bodies failing EQS for PS and/or RBSP	New MS KTM	Number of aquaculture sites/facilities for which measures are required to achieve objectives
1.9 - Point – Other		Number of point sources affecting achievement of objectives	New MS KTM	Number of water bodies affected by measures to achieve objectives
2.1 - Diffuse - Urban run-off	Urban development, Industry	Length (km)/area (km^2) of water bodies that are not achieving objectives because of diffuse urban run off	21 Measures to prevent or control the input of pollution from urban areas, transport and built infrastructure	Number of sustainable drainage systems required to achieve objectives Number of upgraded storm overflows required to achieve objectives Number of surface water interceptors and treatment facilities required to achieve objectives

Significant pressure or chemical substance failing	Main driver(s)	Indicators for pressure	Relevant KTM	Indicators for KTM
				Area (km^2) requiring regulation and/or codes of practice for use and disposal of chemicals in urbanised areas, transport and infrastructure to achieve objectives.
2.2 - Diffuse – Agricultural	Agriculture	Load of nitrogen to be reduced (in tonnes) to achieve objectives	2 Reduce nutrient pollution from agriculture	Area of agricultural land covered by measures (km^2) to achieve objectives
		Load of phosphorus to be reduced (in tonnes) to achieve objectives		Length (km)/area (km^2) of buffer strips required to achieve objectives
		Number of water bodies failing EQS for pesticides originating from diffuse agricultural sources	3 Reduce pesticides pollution from agriculture.	Area of agricultural land covered by measures (km^2) to reduce pesticide pollution in agriculture to achieve objectives
		Number of farms not covered by advisory services	12 Advisory services for agriculture	Number of farms that need to be covered by advisory services to achieve objectives
				Number of advisory services required to achieve objectives
				Area (km^2) of agricultural land requiring measures to achieve objectives
				Number of Farm Surveys required to achieve objectives.

Significant pressure or chemical substance failing	Main driver(s)	Indicators for pressure	Relevant KTM	Indicators for KTM
		Number of water bodies affected by emissions, discharges or losses of priority and priority hazardous substances	15 Measures for the phasing-out of emissions, discharges and losses of priority hazardous substances or for the reduction of emissions, discharges and losses of priority substances.	Number of substances requiring restrictions or bans on uses to achieve objectives
		Number, length, area of water bodies not achieving objectives because of this pressure	17 Measures to reduce sediment loads from soil erosion and surface run-off	Length of river requiring buffer zones to intercept or reduce sediment loads to rivers to achieve objectives
				Area of water body bodies requiring buffer zones to intercept or reduce sediment loads to water bodies to achieve objectives
		Area of agricultural land at risk of soil erosion		Area of agricultural land (km^2) requiring measures to achieve objectives
2.3 - Diffuse – Forestry	Forestry	Number of water bodies not achieving objectives because of this pressure	22 Measures to prevent or control the input of pollution from forestry	Area of forestry land (km^2) requiring measures to reduce nutrient inputs to levels compatible with the achievement of objectives.
		Area (km^2) of forest affecting the achievement of objectives		Length of river requiring buffer zones to intercept or reduce sediment loads to rivers to achieve objectives

Significant pressure or chemical substance failing	Main driver(s)	Indicators for pressure	Relevant KTM	Indicators for KTM
		Area of forestry land (km^2) at risk of soil erosion	17 Measures to reduce sediment loads from soil erosion and surface run-off	Area of forest land (km^2) requiring measures to achieve objectives
				Area of water body bodies requiring buffer zones to intercept or reduce sediment loads to water bodies to achieve objectives.
				Area of forest land (km^2) requiring measures to achieve objectives
2.4 - Diffuse – Transport	Transport	Number of water bodies not achieving objectives because of this pressure	21 Measures to prevent or control the input of pollution from urban areas, transport and built infrastructure	Number of surface water interceptors and treatment facilities required to achieve objectives.
				Length of transport infrastructure required to be subject to regulation and/or codes of practice for use and disposal of chemicals for the achievement of objectives
2.5 - Diffuse – Contaminated sites or abandoned industrial sites	Industry	Number of contaminated sites affecting the achievement of objectives	4 Remediation of contaminated sites (historical pollution including sediments, groundwater, soil)	Area of land covered by the measures (km^2) required to achieve objectives

Significant pressure or chemical substance failing	Main driver(s)	Indicators for pressure	Relevant KTM	Indicators for KTM
				Number of contaminated sites to be remediated or where preventative actions are to be taken to achieve objectives
2.6 - Diffuse - Discharges not connected to sewerage network	Urban development	Length (km)/area (km^2) of water bodies not achieving objectives because of this pressure	21 Measures to prevent or control the input of pollution from urban areas, transport and built infrastructure	Number of upgraded storm overflows required to achieve objectives
				Number of sustainable drainage systems required to achieve objectives.
		Number of discharges not connected to sewerage network that are causing the failure of objectives		Number of discharges required to be connected to sewerage network to achieve objectives
2.7 Diffuse - Atmospheric deposition	Agriculture, Energy - non-hydropower, Industry, Transport, Urban development	Length (km)/area (km^2) of water bodies not achieving objectives because of this pressure	15 Measures for the phasing-out of emissions, discharges and losses of priority hazardous substances or for the reduction of emissions, discharges and losses of priority substances.	Number of substances requiring restrictions or bans on uses to achieve objectives
				Number of new permits required or permits that need to be updated to achieve objectives
				Number of installations covered by the measures required to

Significant pressure or chemical substance failing	Main driver(s)	Indicators for pressure	Relevant KTM	Indicators for KTM
				achieve objectives
			25 Measures to counteract acidification	Number of water bodies that need to be limed to achieve objectives
				Length of buffer zones required to counteract acidification for the achievement of objectives
				Number of new permits required or permits that need to be updated to achieve objectives
				Number of installations that need to be covered by measures to achieve objectives
2.8 - Diffuse – Mining	Industry	Length (km)/area (km^2) of water bodies not achieving objectives because of this pressure	New MS KTM	Number of mines for which measures are required to achieve objectives.
2.9 - Diffuse – Aquaculture	Fisheries and aquaculture	Length (km)/area (km^2) of water bodies not achieving objectives because of this pressure	New MS KTM	Number of aquaculture sites/facilities for which measures are required to achieve objectives
2.10 - Diffuse – Other		Length (km)/area (km^2) of water bodies not achieving objectives because of this pressure	New MS KTM	Number of water bodies affected by the measures required to achieve objectives

Significant pressure or chemical substance failing	Main driver(s)	Indicators for pressure	Relevant KTM	Indicators for KTM
3.1 - Abstraction or flow diversion – Agriculture	Agriculture	Volume of water abstracted/diverted for agriculture (million m^3) to be reduced to achieve objectives.	7 Improvements in flow regime and/or establishment of ecological flows.	Number of revised permit required to achieve objectives
				Number of water bodies where ecological flows need to be established to achieve objectives.
			8 Water efficiency technical measures for irrigation, industry, energy and households	Irrigated area required to be covered by measures to achieve objectives
				Reduction (%) in water consumption required to achieve objectives
			11 Progress in water pricing policy measures for the implementation of the recovery of cost of water services from agriculture	Agricultural area (km^2) where water pricing policy measures are required to achieve the objectives of Article 9
			12 Advisory services for agriculture	Number of farms that need to covered by advisory services to achieve objectives
				Number of advisory services required to achieve objectives
				Area (km^2) of agricultural land that needs to be covered by advisory services to achieve objectives.

Significant pressure or chemical substance failing	Main driver(s)	Indicators for pressure	Relevant KTM	Indicators for KTM
				Number of Farm Surveys required to be undertaken to achieve objectives
3.2 - Abstraction or flow diversion – Public water supply	Urban development	Volume of water abstracted/diverted for public water supply (million m^3) to be reduced to achieve objectives	7 Improvements in flow regime and/or establishment of ecological flows.	Number of revised permit required to achieve objectives
				Number of water bodies where ecological flows need to be established to achieve objectives.
			8 Water efficiency technical measures for irrigation, industry, energy and households	Number of households required to be covered by measures to achieve objectives
				Reduction (%) in water consumption required to achieve objectives
			9 Progress in water pricing policy measures for the implementation of the recovery of cost of water services from households	Size of population for which water pricing policy measures are required to achieve the objectives of Article 9
				Area (km^2) of RBD for which water pricing policy measures are required to achieve the objectives of Article 9

Significant pressure or chemical substance failing	Main driver(s)	Indicators for pressure	Relevant KTM	Indicators for KTM
3.3 - Abstraction or flow diversion – Industry	Industry	Volume of water abstracted/diverted for industry (million m^3) to be reduced to achieve objectives	7 Improvements in flow regime and/or establishment of ecological flows.	Number of revised permit required to achieve objectives
				Number of water bodies where ecological flows need to be established to achieve objectives.
			8 Water efficiency technical measures for irrigation, industry, energy and households	Number of installations required to be covered by measures to achieve objectives
				Reduction (%) in water consumption required to achieve objectives
			10 Progress in water pricing policy measures for the implementation of the recovery of cost of water services from industry	Number of installations for which water pricing policy measures are required to achieve the objectives of Article 9
3.4 - Abstraction or flow diversion – Cooling water	Industry, Energy - non-hydropower	Volume of water abstracted/diverted for cooling water (million m^3) to be reduced to achieve objectives	7 Improvements in flow regime and/or establishment of ecological flows	Number of revised permit required to achieve objectives
				Number of water bodies where ecological flows need to be established to achieve objectives.

Significant pressure or chemical substance failing	Main driver(s)	Indicators for pressure	Relevant KTM	Indicators for KTM
			10 Progress in water pricing policy measures for the implementation of the recovery of cost of water services from industry	Number of installations for which water pricing policy measures are required to achieve the objectives of Article 9
3.5 - Abstraction or flow diversion – Hydropower	Energy - hydropower	Volume of water abstracted/diverted (million m^3) to be reduced to achieve objectives	7 Improvements in flow regime and/or establishment of ecological flows.	Number of revised permit required to achieve objectives
				Number of water bodies where ecological flows need to be established to achieve objectives.
			10 Progress in water pricing policy measures for the implementation of the recovery of cost of water services from industry	Number of installations for which water pricing policy measures are required to achieve the objectives of Article 9
3.6 - Abstraction or flow diversion - Fish farms	Fisheries and aquaculture	Volume of water abstracted/diverted for aquaculture (million m^3) to be reduced to achieve objectives	7 Improvements in flow regime and/or establishment of ecological flows	Number of revised permit required to achieve objectives
				Number of water bodies where ecological flows need to be established to achieve objectives.

Significant pressure or chemical substance failing	Main driver(s)	Indicators for pressure	Relevant KTM	Indicators for KTM
			10 Progress in water pricing policy measures for the implementation of the recovery of cost of water services from industry	Number of installations for which water pricing policy measures are required to achieve the objectives of Article 9
3.7 - Abstraction or flow diversion – Other	Tourism and recreation	Volume of water abstracted/diverted for other purposes (such as recreation) (million m^3) to be reduced to achieve objectives	7 Improvements in flow regime and/or establishment of ecological flows.	Number of revised permit required to achieve objectives
				Number of water bodies where ecological flows need to be established to achieve objectives.
			19 Measures to prevent or control the adverse impacts of recreation including angling	Number of water bodies affected by measures required to achieve objectives
4.1.1 - Physical alteration of channel/bed/riparian area/shore - Flood protection	Flood protection	Length (km) of water bodies affected by alterations for flood protection not compatible with good ecological status/good ecological potential	6 Improving hydromorphological conditions of water bodies other than longitudinal continuity	Length of remeandering of straightened river channels required for the achievement of objectives
				Length of river with bed restoration measures required for the achievement of objectives.
			23 Natural water retention measures	Number of sustainable drainage systems required for the

Significant pressure or chemical substance failing	Main driver(s)	Indicators for pressure	Relevant KTM	Indicators for KTM
				achievement of objectives
				Length/area of water bodies required to be restored or reconnected to floodplains for the achievement of objectives.
4.1.2 - Physical alteration of channel/bed/riparian area/shore - Agriculture	Agriculture	Length (km) of water bodies affected by alterations for agriculture not compatible with good ecological status/good ecological potential	6 Improving hydromorphological conditions of water bodies other than longitudinal continuity	Length of remeandering of straightened river channels required for the achievement of objectives
				Length of river with bed restoration measures required for the achievement of objectives.
				Length or area of bank/shore that will require rehabilitation and/or restoration measures for the achievement of objectives
				Length or area of bank/shore that will require removal of hard infrastructure for the achievement of objectives

Significant pressure or chemical substance failing	Main driver(s)	Indicators for pressure	Relevant KTM	Indicators for KTM
4.1.3 - Physical alteration of channel/bed/riparian area/shore - Navigation	Transport	Length (km) of water bodies affected by alterations for navigation not compatible with good ecological status/good ecological potential	6 Improving hydromorphological conditions of water bodies other than longitudinal continuity	Length of remeandering of straightened river channels required for the achievement of objectives
				Length of river with bed restoration measures required for the achievement of objectives.
				Length or area of bank/shore that will require rehabilitation and/or restoration measures for the achievement of objectives
				Length or area of bank/shore that will require removal of hard infrastructure for the achievement of objectives
4.1.4 - Physical alteration of channel/bed/riparian area/shore – Other		Length (km) of water bodies affected by alterations for other purposes not compatible with good ecological status/good ecological potential	6 Improving hydromorphological conditions of water bodies other than longitudinal continuity	Length of remeandering of straightened river channels required for the achievement of objectives

Significant pressure or chemical substance failing	Main driver(s)	Indicators for pressure	Relevant KTM	Indicators for KTM
				Length of river with bed restoration measures required for the achievement of objectives.
				Length or area of bank/shore that will require rehabilitation and/or restoration measures for the achievement of objectives
				Length or area of bank/shore that will require removal of hard infrastructure for the achievement of objectives
4.1.5 - Physical alteration of channel/bed/riparian area/shore – Unknown or obsolete		Length (km) of water bodies affected by alterations for unknown purposes not compatible with good ecological status/good ecological potential	6 Improving hydromorphological conditions of water bodies other than longitudinal continuity	Length of remeandering of straightened river channels required for the achievement of objectives
				Length of river with bed restoration measures required for the achievement of objectives.

Significant pressure or chemical substance failing	Main driver(s)	Indicators for pressure	Relevant KTM	Indicators for KTM
				Length or area of bank/shore that will require rehabilitation and/or restoration measures for the achievement of objectives
				Length or area of bank/shore that will require removal of hard infrastructure for the achievement of objectives
4.2.1 - Dams, barriers and locks - Hydropower	Energy – hydropower	Number of dams, weirs, barriers and locks associated with hydropower that have conditions not compatible with the achievement of good ecological status/good ecological potential	5 Improving longitudinal continuity (e.g. establishing fish passes, demolishing old dams).	Number of barriers required to be tackled for the achievement of objectives
				Length (km) or area (km^2) of river network that will be affected by the measures required to achieve objectives
				Number of fish/continuity passes required to be installed to achieve objectives
4.2.2 - Dams, barriers and locks - Flood protection	Flood Protection	Number of dams, weirs, barriers and locks associated with flood protection that have conditions not compatible with the achievement of good ecological status/good ecological potential	5 Improving longitudinal continuity (e.g. establishing fish passes, demolishing old dams).	Number of barriers required to be tackled for the achievement of objectives

Significant pressure or chemical substance failing	Main driver(s)	Indicators for pressure	Relevant KTM	Indicators for KTM
				Length (km) or area (km^2) of river network that will be affected by the measures required to achieve objectives
				Number of fish/continuity passes required to be installed to achieve objectives
4.2.3 - Dams, barriers and locks - Drinking water	Urban development	Number of dams, weirs, barriers and locks associated with drinking water that have conditions not compatible with the achievement of good ecological status/good ecological potential	5 Improving longitudinal continuity (e.g. establishing fish passes, demolishing old dams).	Number of barriers required to be tackled for the achievement of objectives
				Length (km) or area (km^2) of river network that will be affected by the measures required to achieve objectives
				Number of fish/continuity passes required to be installed to achieve objectives
4.2.4 - Dams, barriers and locks - Irrigation	Agriculture	Number of dams, weirs, barriers and locks associated with irrigation that have conditions not compatible with the achievement of good ecological status/good	5 Improving longitudinal continuity (e.g. establishing fish passes, demolishing old dams).	Number of barriers required to be tackled for the achievement of objectives

Significant pressure or chemical substance failing	Main driver(s)	Indicators for pressure	Relevant KTM	Indicators for KTM
		ecological potential		
				Length (km) or area (km^2) of river network that will be affected by the measures required to achieve objectives
				Number of fish/continuity passes required to be installed to achieve objectives.
4.2.5 - Dams, barriers and locks - Recreation	Tourism and recreation	Number of dams, weirs, barriers and locks associated with recreation that have conditions not compatible with the achievement of good ecological status/good ecological potential	5 Improving longitudinal continuity (e.g. establishing fish passes, demolishing old dams).	Number of barriers required to be tackled for the achievement of objectives
				Length (km) or area (km^2) of river network that will be affected by the measures required to achieve objectives
				Number of fish/continuity passes required to be installed to achieve objectives.

Significant pressure or chemical substance failing	Main driver(s)	Indicators for pressure	Relevant KTM	Indicators for KTM
4.2.6 - Dams, barriers and locks - Industry	Industry, Energy - non-hydropower	Number of dams, weirs, barriers and locks associated with industry that have conditions not compatible with the achievement of good ecological status/good ecological potential	5 Improving longitudinal continuity (e.g. establishing fish passes, demolishing old dams).	Number of barriers required to be tackled for the achievement of objectives
				Length (km) or area (km^2) of river network that will be affected by the measures required to achieve objectives
				Number of fish/continuity passes required to be installed to achieve objectives.
4.2.7 - Dams, barriers and locks - Navigation	Transport	Number of dams, weirs, barriers and locks associated with navigation that have conditions not compatible with the achievement of good ecological status/good ecological potential	5 Improving longitudinal continuity (e.g. establishing fish passes, demolishing old dams).	Number of barriers required to be tackled for the achievement of objectives
				Length (km) or area (km^2) of river network that will be affected by the measures required to achieve objectives
				Number of fish/continuity passes required to be installed to achieve objectives.

Significant pressure or chemical substance failing	Main driver(s)	Indicators for pressure	Relevant KTM	Indicators for KTM
4.2.8 - Dams, barriers and locks – Other		Number of dams, weirs, barriers and locks associated with other uses that have conditions not compatible with the achievement of good ecological status/good ecological potential	5 Improving longitudinal continuity (e.g. establishing fish passes, demolishing old dams).	Number of barriers required to be tackled for the achievement of objectives
				Length (km) or area (km^2) of river network that will be affected by the measures required to achieve objectives
				Number of fish/continuity passes required to be installed to achieve objectives.
4.2.9 - Dams, barriers and locks – Unknown or obsolete		Number of dams, weirs, barriers and locks that have conditions not compatible with the achievement of good ecological status/good ecological potential	5 Improving longitudinal continuity (e.g. establishing fish passes, demolishing old dams).	Number of barriers required to be tackled for the achievement of objectives
				Length (km) or area (km^2) of river network that will be affected by the measures required to achieve objectives
				Number of fish/continuity passes required to be installed to achieve objectives.

Significant pressure or chemical substance failing	Main driver(s)	Indicators for pressure	Relevant KTM	Indicators for KTM
4.3.1 - Hydrological alteration – Agriculture	Agriculture	Length (km) /area (km^2) of water bodies where hydrological alterations for agricultural purposes are preventing the achievement of good ecological status/good ecological potential	7 Improvements in flow regime and/or establishment of ecological flows.	Number of revised permit required to achieve objectives
				Number of water bodies where ecological flows need to be established to achieve objectives.
4.3.2 - Hydrological alteration – Transport	Transport	Length (km) /area (km2) of water bodies where hydrological alterations for transport purposes are preventing the achievement of good ecological status/good ecological potential	7 Improvements in flow regime and/or establishment of ecological flows.	Length of rivers (km) affected by the measures required for the achievement of objectives.
				Number of revised permit required to achieve objectives
				Number of water bodies where ecological flows need to be established to achieve objectives.

Significant pressure or chemical substance failing	Main driver(s)	Indicators for pressure	Relevant KTM	Indicators for KTM
4.3.3 - Hydrological alteration – Hydropower	Energy – hydropower	Length (km) /area (km^2) of water bodies where hydrological alterations for hydropower production are preventing the achievement of good ecological status/good ecological potential	7 Improvements in flow regime and/or establishment of ecological flows.	Number of water bodies where the operational modification of hydro-peaking is required for the achievement of objectives.
				Number of revised permit required to achieve objectives
				Number of water bodies where ecological flows need to be established to achieve objectives.
4.3.4 - Hydrological alteration – Public water supply	Urban development	Length (km) /area (km^2) of water bodies where hydrological alterations for public water supply purposes are preventing the achievement of good ecological status/good ecological potential	7 Improvements in flow regime and/or establishment of ecological flows.	Number of revised permit required to achieve objectives
				Number of water bodies where ecological flows need to be established to achieve objectives.
4.3.5 - Hydrological alteration - Aquaculture	Fisheries and aquaculture	Length (km) /area (km^2) of water bodies where	7 Improvements in flow regime and/or establishment	Number of revised permit required to achieve objectives

Significant pressure or chemical substance failing	Main driver(s)	Indicators for pressure	Relevant KTM	Indicators for KTM
		hydrological alterations for aquaculture purposes are preventing the achievement of good ecological status/good ecological potential	of ecological flows.	Number of water bodies where ecological flows need to be established to achieve objectives.
4.3.6 - Hydrological alteration – other		Length (km) /area (km^2) of water bodies where hydrological alterations for other purposes are preventing the achievement of good ecological status/good ecological potential	7 Improvements in flow regime and/or establishment of ecological flows.	Number of revised permit required to achieve objectives
				Number of water bodies where ecological flows need to be established to achieve objectives.
4.4 – Hydromorphological alteration - Physical loss of whole or part of the water body	Flood Protection, Climate change	Length (km) /area (km^2) of water bodies where physical loss of habitats are preventing the achievement of good ecological status/good ecological potential	New MS KTM	Length/area of water bodies that are required to be restored or reconnected to floodplains for the achievement of objectives.
				Length/area of water bodies that require to be restored to achieve objectives
				Number of water bodies affected by the measures required to achieve objectives

Significant pressure or chemical substance failing	Main driver(s)	Indicators for pressure	Relevant KTM	Indicators for KTM
				Length/area of water bodies affected by the measures required to achieve objectives
4.5 - Hydromorphological alteration - Other		Length (km)/area (km^2) of water bodies where other hydromorphological alterations are preventing the achievement of good ecological status/good ecological potential	New MS KTM	Length/area of water bodies affected by the measures required to achieve objectives
5.1 - Introduced species and diseases	Transport, Fisheries and aquaculture, Tourism and recreation	Number of introduced species preventing the achievement of GES/GEP	18 Measures to prevent or control the adverse impacts of invasive alien species and introduced diseases	Number of species for which codes of practice for reducing the spread of invasive alien species are required to be developed and implemented for the achievement of objectives.
				Number of water bodies required to have eradication or control measures for the achievement of objectives
				Number of Individual Species Action Plans required for species identified as presenting particular risk levels for the achievement of objectives

Significant pressure or chemical substance failing	Main driver(s)	Indicators for pressure	Relevant KTM	Indicators for KTM
		Number of introduced diseases preventing the achievement of GES/GEP		Number of water bodies required to have eradication or control measures for the achievement of objectives
5.2 - Exploitation or removal of animals or plants	Recreation, Fisheries and aquaculture	Length (km) /area (km^2) of water bodies where the exploitation/removal of animal/plants is preventing the achievement of good ecological status/good ecological potential	20 Measures to prevent or control the adverse impacts of fishing and other exploitation/removal of animal and plants	Number of water bodies affected by the measures required to achieve objectives
				Length/area of water bodies affected by the measures required to achieve objectives
5.3 – Litter or fly tipping	Urban development, Transport	Length (km) of water bodies impacted by litter or fly tipping	New MS KTM	Length of water bodies where litter is required to be removed to achieve objectives
				Number of sources of litter that require control measures to achieve objectives
6.1 - Groundwater - recharges	Agriculture, Energy – non-hydropower, Industry, Urban development	Area of groundwater bodies not achieving objectives because of groundwater recharges	New MS KTM	Area of water bodies affected by the measures required to achieve objectives

Significant pressure or chemical substance failing	Main driver(s)	Indicators for pressure	Relevant KTM	Indicators for KTM
6.2 - Groundwater – Alteration of water level or volume	Industry, Urban development	Area of groundwater bodies not achieving objectives because of alteration of water levels/volumes	New MS KTM	Area of water bodies affected by the measures required to achieve objectives
7 - Anthropogenic pressure - Other		Length (km) /area (km^2) of water bodies where other anthropogenic pressures are causing the non achievement of objectives	New MS KTM	Length/area of water bodies affected by the measures required to achieve objectives
8 – Anthropogenic pressure -Unknown		Length (km) /area (km^2) of water bodies where unknown pressures are causing the non achievement of objectives	New MS KTM	Length/area of water bodies affected by the measures required to achieve objectives
A number of pressure may be applicable - MS to select those relevant	Any driver	See list of potential indicators for the selected relevant pressures	13 Drinking water protection measures (e.g. establishment of safeguard zones, buffer zones etc)	Number of drinking water protection zones required to achieve objectives
				Number of water bodies that are required to be affected by drinking water protection measures for the achievement of objectives
Any pressure may be applicable - MS to select those relevant	Any driver	See list of potential indicators for the selected relevant pressures	14 Research, improvement of knowledge base reducing uncertainty.	Number of the research studies etc. that are required to achieve objectives.

Significant pressure or chemical substance failing	Main driver(s)	Indicators for pressure	Relevant KTM	Indicators for KTM
				Number of water bodies that are expected to achieve objectives as a result of research etc.
Failure of good chemical status by a Priority Substance	Agriculture, urban development, industry, transport	Loads of priority substances that require to be reduced (in tonnes) to achieve objectives.	15 Measures for the phasing-out of emissions, discharges and losses of priority hazardous substances or for the reduction of emissions, discharges and losses of priority substances.	Number of revised permit required to achieve objectives
				Number of installation where upgrades or improvements are required to achieve objectives
				Number of substances requiring restrictions or bans on uses to achieve objectives
		Number of water bodies failing EQS for priority substances	3 Reduce pesticides pollution from agriculture.	Area of agricultural land required to be covered by measures to achieve objectives
				Length (km)/area (km^2) of buffer strips required to achieve objectives.
			4 Remediation of contaminated sites (historical pollution including sediments, groundwater, soil).	Area (km^2) of land required to be covered by measures to achieve objectives.
				Number of sites requiring measures to achieve objectives
			13 Drinking water protection measures (e.g. establishment of safeguard zones, buffer zones etc)	Number of drinking water protection zones required to achieve objectives

Significant pressure or chemical substance failing	Main driver(s)	Indicators for pressure	Relevant KTM	Indicators for KTM
				Area of land required to be covered by drinking water protection zones to achieve objectives
			16 Upgrades or improvements of industrial wastewater treatment plants (including farms)	Number of installation where upgrades or improvements are required to achieve objectives.
				Number of new permits required, or require to be updated, to achieve objectives.
			21 Measures to prevent or control the input of pollution from urban areas, transport and built infrastructure	Number of sustainable drainage systems required to achieve objectives
				Number of upgraded storm overflows required to achieve objectives
				Number of pesticides and other chemicals requiring restrictions or bans on uses to achieve objectives
				Number of surface water interceptors and treatment systems required to achieve objectives.

Significant pressure or chemical substance failing	Main driver(s)	Indicators for pressure	Relevant KTM	Indicators for KTM
Failure of good ecological status by a River Basin Specific Pollutant	Agriculture, urban development, industry, transport, forestry, aquaculture, energy	Loads of river basin specific pollutants that require to be reduced (in tonnes) to achieve objectives Number of water bodies failing EQS for RBSP	3 Reduce pesticides pollution from agriculture.	Area of agricultural land required to be covered by measures to achieve objectives
				Length (km)/area (km^2) of buffer strips required to achieve objectives.
			4 Remediation of contaminated sites (historical pollution including sediments, groundwater, soil).	Area (km^2) of land required to covered by measures to achieve objectives.
				Number of sites requiring measures to achieve objectives
			13 Drinking water protection measures (e.g. establishment of safeguard zones, buffer zones etc)	Number of drinking water protection zones required to achieve objectives
				Area of land required to be covered by drinking water protection zones to achieve objectives
			16 Upgrades or improvements of industrial wastewater treatment plants (including farms)	Number of installation where upgrades or improvements are required to achieve objectives
				Number of new permits required, or require to be updated, to achieve objectives.

Significant pressure or chemical substance failing	Main driver(s)	Indicators for pressure	Relevant KTM	Indicators for KTM
			21 Measures to prevent or control the input of pollution from urban areas, transport and built infrastructure	Number of sustainable drainage systems required to achieve objectives.
				Number of upgraded storm overflows required to achieve objectives.
				Number of pesticides and other chemicals requiring restrictions or bans on uses to achieve objectives
				Number of surface water interceptors and treatment systems required to achieve objectives.
			22 Measures to prevent or control the input of pollution from forestry	Area of forested land (km^2) required to be covered by measures to achieve objectives.
				Length (km)/area (km^2) of buffer strips required to achieve objectives.

Annex 4: Groundwater bodies and horizon assignment

GROUNDWATER BODIES AND HORIZON ASSIGNMENT

1. BACKGROUND

1.1. Water Framework Directive (WFD)

The Water Framework Directive (WFD, 2000/60/EC) considers a groundwater body (GWB) as a coherent management unit assigned to a River Basin District (RBD) which has to meet the Environmental Objectives (Article 4) . The term "body of groundwater" should therefore be understood in the context of the hierarchy of relevant definitions provided under Article 2 of the WFD:

- According to WFD Article 2.2, "Groundwater" means all water, which is below the surface of the ground in the saturated zone and in direct contact with the ground or sub-soil;
- According to Article 2.11, "Aquifer" means a subsurface layer or layers of rock or other geological strata of sufficient porosity and permeability to allow either a significant flow of groundwater or the abstraction of significant quantities of groundwater;
- According to Article 2.12, "Groundwater body" means a distinct volume of groundwater within an aquifer or aquifers.

According to the definitions and the specifications laid down in the WFD, groundwater bodies are management units with the main purpose of enabling their quantitative and qualitative status to be accurately described and compared to the Environmental Objectives and of implementing the measures necessary for achieving these objectives. Groundwater management has to consider groundwater in relation to its uses and functions and its interactions with aquatic and terrestrial ecosystems and in relation to the natural conditions (geology, hydrogeology etc.) and anthropogenic influences (pressures).

1.2. GWB delineation – horizontal dimension

The delineation of GWBs comprises both, the horizontal and the vertical dimension, considering the following features:

- Groundwater flow divides, using surface water catchments and geological boundaries as proxies where information is limited.
- Pressure variations, where these are significant at a river basin level and where they require different management.
- Variations in natural background levels (NBL).
- Coastline, unless there is specific evidence that groundwater beyond the coastline has a resource value in terms of legitimate uses.
- Association to aquatic ecosystems or groundwater dependency of terrestrial ecosystems.
- Boundary of a hydrographical entity that is already subject to a local management plan.

1.3. GWB delineation – vertical dimension

The vertical characterization of a GWB depends on:

- whether the volume of the groundwater concerned is located within one or within several aquifers;
- The risks according to the objectives of the WFD.

It is up to each Member State and its national groundwater management strategy how GWBs are delineated (in accordance with the definitions under WFD Article 2), whether GWBs are defined separately for each individual stratum overlying each other or merging different strata.

The vertical heterogeneity/variability of a hydrogeological setting can lead to many different arrangements of differently delineated GWBs. If hydrogeology is not the only factor considered (which is probably the case), many additional ways of delineation and types of configuration are possible.

Error! Reference source not found. illustrates one example hydrogeological setting and four different (non-exhaustive) options of GWB delineation and arrangements which are in the following used to illustrate the challenge and proposed procedure of horizon assignment.

Figure 6: Four different (non-exhaustive) options of GWB delineation for one specific hydrogeological context

In addition to the areal variability, the vertical variability makes homogenization work at the pan-European scale very complex, particularly for transboundary GWBs where the connected GWBs may be differently delineated by the Member States because of different national approaches, focuses or management constraints.

1.4. Horizon assignment

1.4.1. Horizons: what for?

GWBs are three-dimensional entities; however the representation of the feature will be as 2-D polygons. Borders of polygons of GWBs are their projection on the surface. It is necessary that multiple overlapping groundwater bodies at different depths with non-identical boundaries are distinguished in different horizons (layers) (EU, 2009). The characterisation of the vertical position of GWBs by 'horizons' should:

- help to reflect the three-dimensionality of GWBs and their vertical (relative) position to other GWBs.
- enable the stratified visualization of GWBs on maps and
- **help to identify and visualise those (parts of) GWBs which are probably most exposed to anthropogenic pressures on the surface – the uppermost horizon, the outcrops** (like for geological maps).

1.4.2. Concept – Guidance 2009

'Horizon' was a mandatory reporting element within WFD reporting to WISE. The concept of assignment of whole GWBs to horizons is laid down in the 'Guidance on the reporting of geographical data for the WFD' (EU, 2009) and followed a simple numeration in the sense of the numerical position of the GWB starting with the first GWB-horizon from the surface.

1.4.3. Results from the first WISE reporting

The EU wide compilation and assessment of the provided geographical data (including the assignment to horizons) for GWBs showed that the data finally did not allow for achieving a non-ambiguous picture of the three-dimensionality of groundwater and GWBs which hampers the compilation of a GWB map for Europe. To date, a comparable vertical positioning and a clear mapping of GWBs is actually impossible at the European scale. The European map prepared for the 2nd Workshop on Groundwater Bodies (Duscher & Struckmeier, 2011) reveals several discrepancies.

The majority of 13,345 GWB polygons reported in Europe to WISE are assigned to horizon 1 (10,871), followed by polygons allocated to horizon 2 (1,584). Polygons assigned to horizons 3 and more represent 3% of the total.

The main issues highlighted into the ETC/ICM report of 2013 are the following:

- The majority of Member State reported GWBs up-to horizon 4; few assigned their GWBs to more than 4 horizons (France, Italy, Estonia, Lithuania);
- Some Member States did not assign their GWBs to horizons (Spain and UK (Northern Ireland));

- Nine Member States did not consider subdivision and assigned all GWBs to horizon 1 and/or horizon 0;
- Some Member States reported GWBs which extend over several horizons;
- Some GWBs overlay each other within the same horizon.

1.4.4. Deficits of the current approach

The main structural deficits are:

- The current definition only allows that each GWB as a whole is assigned to exactly one horizon. But for representing complex stratifications this simple approach is not appropriate. It turned out quite difficult to assign to a single horizon, for example, downgrade GWBs that outcrop somewhere and are overlain in other parts by other GWBs.
- The definition of 'horizons' might not be explicit enough or probably not sufficiently generic leading to deviating interpretations or wrong assignments in the Member States.
- The number of horizons is limited to four.
- The parameter 'horizon' might not be sufficient to characterize the three-dimensionality of GWBs. In addition, other parameters such as "Average Depth", "Average Thickness" and "Depth range" are helpful.
- The current approach does not allow for a non-ambiguous join of transboundary GWBs.

2. RECOMMENDATIONS FOR HORIZON ASSIGNMENT – TO ENABLE HOMOGENEOUS MAPPING AT A PAN-EUROPEAN SCALE

Within this chapter a revised approach for horizon assignment is proposed. This approach is illustrated by three different examples of GWB arrangements which are based on a hydrogeological example context.

2.1. Amended proposal for horizon assignment

Considering the main problems identified in chapter **Error! Reference source not found.**, the existing methodology is proposed to be kept and extended by the following features:

- The assignment of horizons follows a simple numeration in the sense of the numerical position of the groundwater body starting with the first GWB-horizon from the surface (EU, 2009)
- **Groundwater bodies can be split into sub-units for the purpose of assigning these sub-units individually to corresponding horizons**, depending on the overlap with other GWBs;
- **There is no limitation in the number of horizons**;
- **Overlaying groundwater bodies cannot be associated to the same horizon**.

Horizon Code	Brief description
1	(Part of) first GWB from the surface

2	(Part of) second GWB from the surface
3	(Part of) third GWB from the surface
4	(Part of) fourth GWB from the surface
5	(Part of) fifth GWB from the surface
…etc….	…etc….

It has to be emphasized that the assignment of GWBs to horizons should not be mixed with (is separate from) the delineation of GWBs which is strictly subject to Member State's decisions and methods. Horizon assignment is just a tool for harmonization to enable coherent visualisation of GWBs at the European level and to support transboundary coordination. It is therefore solely a matter of reporting.

Except for the uppermost horizon (horizon 1) the assignment of a (part of a) GWB to a certain horizon does not give any information about its absolute vertical position within the overall schema, just the relative position to overlying or underlying (parts of) GWBs from the surface.

2.2. Amended proposal for reporting of GIS information to WISE

It is proposed to report GIS information with the following architecture:

- Reporting groundwater bodies using the GroundWaterBody data set

The horizons attribute identifies the different horizons present in the waterbody, to be reported as a comma-separated list of integer values.

- Reporting horizons using the GroundWaterBodyHorizon data set

Attribute name	Obligation	Type	Description
thematicIdIdentifier	Required	FeatureUniqueEUCodeType	euGroundWaterBodyCode of the Ground Water Body as defined in the GroundWaterBody reporting schema. Code MUST have a 1-to-1 relationship with euGroundWaterBodyCode and further attribute data described in the related XML file.
thematicIdIdentifierScheme	Required	CharacterString	Identifier defining the scheme used to assign the identifier.
horizon	Required	integer	Numeration in the sense of

			the numerical position of groundwater body layer starting at the first GWB-horizon from the surface (as proposed in the table above). Multiplicity 0...99

2.3. Four Examples

The proposed procedure is illustrated in the following subchapters by four examples of GWB delineations which are based on an example hydrogeological setting.

It is important to consider, that the following examples are not intended to stipulate any discussion about the presented delineation and configuration of GWBs. All four examples are realistic. The only purpose of these examples is to demonstrate the ability of the proposed procedure to cover all types of GWB arrangements.

2.3.1. Example 1

Hydrogeological context – Map view and sectional view

Delineated groundwater bodies

Example 1 – Map view

Example 1 – Sectional view

Horizon assignment – Map view

Example 1 – Horizon 1

Example 1 – Horizon 3

Example 1 – Horizon 2

Horizon assignment – Vertical subsequential arrangement

Horizon 1			
Horizon 2			
Horizon 3			

Proposal for GIS layer reporting:

Reporting groundwater bodies using the GroundWaterBody data set

thematicIdIdentifier	horizons	
GWB1	1	
GWB2	1	
GWB3	1	
GWB4	2	
GWB5	3	

2.3.2. Example 2

Hydrogeological context – Map view and sectional view

Delineated groundwater bodies

Example 2 – Map view

Example 2 – Sectional view

Horizon assignment – Map view

Example 2 – Horizon 1

Example 2 – Horizon 3

Example 2 – Horizon 2

Horizon assignment – Vertical subsequential arrangement

Proposal for GIS layers reporting:

Reporting groundwater bodies using the GroundWaterBody data set

thematicIdIdentifier	**horizons**	
GWB1	1	
GWB2	1,2	
GWB3	2,3	

and GroundWaterBodyHorizon data set

thematicIdentifier	thematicIdentifierScheme	horizon
GWB2	euGroundWaterBodyCode	1
GWB2	euGroundWaterBodyCode	2
GWB3	euGroundWaterBodyCode	2
GWB3	euGroundWaterBodyCode	3

2.3.3. Example 3

Hydrogeological context – Map view and sectional view

Delineated groundwater bodies

Example 3 – Map view

Example 3 – Sectional view

Horizon assignment – Map view

Example 3 – Horizon 1

Example 3 – Horizon 3

Example 3 – Horizon 2

Horizon assignment – Vertical subsequential arrangement

Proposal for GIS layers reporting:

Reporting groundwater bodies using the GroundWaterBody data set

thematicIdIdentifier	horizons	
GWB1	1	
GWB2	1,2	
GWB3	2,3	
GWB4	3,4	

and GroundWaterBodyHorizon data set

thematicIdentifier	thematicIdentifierScheme	horizon
GWB2	euGroundWaterBodyCode	1
GWB2	euGroundWaterBodyCode	2
GWB3	euGroundWaterBodyCode	2
GWB3	euGroundWaterBodyCode	3
GWB4	euGroundWaterBodyCode	3
GWB4	euGroundWaterBodyCode	4

2.3.4. Example 4 – non-contiguous bodies

Hydrogeological context – Map view and sectional view

Delineated groundwater bodies

Example 3 – Map view

Example 3 – Sectional view

Horizon assignment – Map view

Example 3 – Horizon 1

Example 3 – Horizon 3

Example 3 – Horizon 2

Horizon assignment – Vertical subsequential arrangement

Proposal for GIS layers reporting:

Reporting groundwater bodies using the GroundWaterBody data set

thematicIdentifier	horizons	
GWB1	1	
GWB2	2	
GWB3	1,2,3	

and GroundWaterBodyHorizon data set

thematicIdentifier	thematicIdentifierScheme	horizon
GWB3	euGroundWaterBodyCode	1
GWB3	euGroundWaterBodyCode	2
GWB3	euGroundWaterBodyCode	3

Please refer to GIS Guidance for futher information on the GIS layers reporting.

2.4. Migration from current horizon classification to the amended proposal

2.4.1. No overlapped GWBs in one unique horizon

For a large majority of Member States, each groundwater body is assigned to one unique horizon and there are no overlapped groundwater bodies within one horizon.

In this case, the procedure proposed to re-assigned horizon number in accordance with the amended proposal is the following:

It has to be emphasized that this procedure can be carried out provided that the current existing horizon layers were defined strictly in accordance with the numeration proposed in guidance document of 2009.

2.4.2. Existing overlapped GWBs in one unique horizon

The analysis of groundwater bodies that are actually available in WISE shows that some Member States assigned overlapped groundwater bodies to one unique horizon (i.e. IT, BE, BG, EE, DK, LA).

The amended proposal needs a good comprehension of the vertical situation for all GWBs. As a consequence, overlapped GWBs assigned to one horizon need to be differentiated vertically before applying the proposed procedure of horizon re-assignment. To do so, Member States concerned shall then assign a stratigraphic order to their groundwater bodies.

It is recommended to carry out this task as a preliminary step (i.e. by adding a temporary attribute on the current layer that will contain the stratigraphic absolute order of each GWB). Step 2 where polygons are assigned to groundwater bodies and their horizon needs to be done cautiously.

2.5. Resumee

The proposed procedure covers both simple and complex hydrogeological configurations:

- In areas with simple hydrogeology, or simple GWB delineation, the situation remains unchanged compared to the current procedure which means that additional efforts due to the changes are very limited.
- For more complex situations, their complexity can fully be taken into account without the use of complementary parameters (such as “extra Horizon” proposed by Belgium in 2010).
- It would be quite easy to prepare a map showing the (parts of) GWBs which are most exposed to pressures on the surface or in the uppermost layer (soil).

2.6. Recommendation for map production

It is recommended that the EEA includes an explanation of what the maps represent when they produce these. The following wording is suggested:

“Groundwater bodies are assigned to horizons which overlie each other. Horizons help to reflect the three-dimensionality of groundwater bodies and their relative position vertically to other groundwater bodies. This map shows horizon 1, which contains the first layer of groundwater bodies to be encountered across each member state. In some areas the groundwater bodies outcrop and are vulnerable to pollution from activities at the ground surface. In other parts the groundwater bodies are overlain by other strata which provide protection from pollution. This map does not seek to distinguish between these geological circumstances.”

It is further recommended that the EEA should include a block diagram to illustrate how horizons and groundwater bodies overlie each other.

2.7. References

Duscher, K., Struckmeier, W. (2011) – A common vision about groundwater entities in Europe, Presentation at the 2nd Workshop on Groundwater bodies held in Berlin 15th-16th December 2011.

ETC/ICM (2013) – Groundwater GIS reference layer. Submission/compilation status and evaluation. Version 3.

European Commission (2003) – Guidance Document No 2: Identification of Water Bodies. ISBN 92-894-5122-X. European Communities, Luxembourg.

European Commission (2009) – Guidance on reporting of spatial data for the WFD (RBMP). Tools and services for reporting under RBMP within WISE. Version 3.0. .

European Commission (2010) – Guidance Document No. 26. Guidance on Risk Assessment and the use of conceptual models for groundwater.

UK Technical Advisory Group on the Water Framework Directive (2012) – Defining & Reporting on Groundwater Bodies. Final version.

Ward, R. (2011) – 2nd Workshop on Groundwater Bodies held in Berlin 15/16 December 2011, Presentation at the 22nd Working Group C plenary meeting held in Brussels the 21st March 2012.

Annex 5 is available as a separate document

Annex 6 is available as a separate document

Annex 7: Reporting guidance on inventories

The CIS Technical Guidance Document No. 28, "Technical Guidance on the Preparation of an Inventory of Emissions, Discharges and Losses of Priority and Priority Hazardous Substances[143]" (TGD 28), sets out the steps to help Member States establish their inventories. The purpose of this annex is to relate SoE-WISE categories to the sources and pathways set out in that guidance. This is intended to allow the collection of comparable data which may then be used in assessment of sources, trends and review of policy measures.

As set out in Section 9.3 of the WFD Reporting Guidance 2016, different source and/or pathway categorisation schemes exist. Of particular relevance here are: the source or pathway categories in TGD 28; the WISE SoE emissions source categories http://dd.eionet.europa.eu/datasets/latest/Emissions ; the WFD list of pressure types[144]. Efforts to harmonise these categories are under way, with the alignment of WISE SoE source categories with WFD pressures and new WISE SoE Emission reporting (2015) to be based on the updated source category code list.

Section III.1 of TGD 28 describes the general working scheme of the inventory of emissions. Sources, pathways and riverine loads to surface waters are considered. To reduce the risk of differing interpretations as to where data should be recorded, the information in tables [2i] and [2ii] below is provided to assist Member States in their submission of inventory data.

For the 2nd RBMPs, the following notes are intended to facilitate voluntary reporting of pollutant inputs according to one of the above categorisations.

Table 1 illustrates approximate correspondence between the source and pathway categories in TGD28, SoE source categories and WFD list of pressures. See also Figure 5 in Section 9.3 of the WFD Reporting Guidance 2016.

Table 1: Relationships between the source and pathway categories in the CIS Inventory Guidance, the SoE source categories and the WFD list of pressures

Inventory Guidance source	**Inventory Guidance pathway**	**SoE emissions code**	**WFD pressure type (source code)**
Air Emissions	P1: Atmospheric Deposition directly to Surface Waters	NP2[145]	2.7
Agriculture, Air Emissions	P2: Erosion	Can be a component in NP1, NP2, NP7, NP8 and NP72	Source-dependent

[143] https://circabc.europa.eu/sd/a/6a3fb5a0-4dec-4fde-a69d-5ac93dfbbadd/Guidance%20document%20n28.pdf
[144] See Annex 1a of of the WFD Reporting Guidance 2016.
[145] This WISE SoE source category includes atmospheric deposition for diffuse source on the whole surface of RBD or sub-unit (not only direct deposition to water surfaces).

Inventory Guidance source	Inventory Guidance pathway	SoE emissions code	WFD pressure type (source code)
Agriculture, Air Emissions	P3: Surface Runoff from Unsealed Areas	Can be a component in NP1, NP2, NP7, NP8 and NP72	2.2, 2.3, 2.4, 2.7, 2.10
Agriculture, Households, Air Emissions	P4 Interflow, Tile Drainage and Groundwater	Can be a component in NP1, NP 2, NP7, NP8 and NP72	Source-dependent
Agriculture	P5: Direct Discharges and Drifting	NP1	2.2
Air Emissions, Transportation and Infrastructure, Construction Material	P6: Surface Runoff from Sealed Areas	can be a component in NP 2, NP7 and NP72	2.1, 2.4
Air Emissions, Transportation and Infrastructure, Construction Material, Households, Industry	P7: Storm Water Outlets, Combined Sewer Overflows and Unconnected Sewers	U1+ NP5	1.2
Air Emissions, Transportation and Infrastructure, Construction Material, Households, Industry	P8: Urban Waste Water Treated	U2	1.1
Households	P9: Individual - Treated and Untreated - Household Discharges	NP3	2.6
Industry	P10 Industrial Waste Water treated (and untreated)	I3+ I4	1.3, 1.4
Abandoned and Historic Mines	P11: Direct Discharges from	O	1.7, 2.8

Inventory Guidance source	Inventory Guidance pathway	SoE emissions code	WFD pressure type (source code)
	Mining Areas		
Inland Navigation	P12: Direct Discharges from Navigation	NP7	2.4
Natural Background	P13 Natural Background	NP8	Not applicable

Tables 2i and 2ii show how to correlate between the WFD list of pressure types list and SoE emissions source categories.

Table 2i: Relationship between the WFD list of pressure types to WISE SoE emissions source categories

WFD pressure type	WISE SoE emissions source
1 – Point source of pollution	PT – Point sources *Note that the proper correspondence is PT plus NP5.*
1.1 – Point - Urban waste water	U – Point - Urban waste water *Further disaggregation is possible in the WISE SoE Emissions data flow.*
1.2 – Point - Storm overflows	NP5 – Diffuse - Storm overflow emissions *Note that in the WISE SoE Emissions data flow, this source is reported as a diffuse sources.*
1.3 – Point - IED plants	I – Point - Industrial waste water *Further disaggregation is possible in the WISE SoE Emissions data flow.*
1.4 – Point - Non IED plants	I – Point - Industrial waste water *Further disaggregation is possible in the WISE SoE Emissions data flow.*
1.5 – Point - Contaminated sites or abandoned industrial sites	O1 – Point - Contaminated sites or abandoned industrial sites *Note that under WISE SoE Emissions, these emissions can be included in the "O – Point - Other" value if the data is not disaggregated by subcategory.*
1.6 – Point - Waste disposal sites	O2 – Point - Waste disposal sites *Note that under WISE SoE Emissions, these emissions can be included in the "O – Point - Other" value if the data is not disaggregated by subcategory.*
1.7 – Point - Mine waters	O3 – Point - Mine waters *Note that under WISE SoE Emissions, these emissions can be included in the "O – Point - Other" value if the data is not disaggregated by subcategory.*
1.8 – Point - Aquaculture	O4 – Point - Aquaculture *Note that under WISE SoE Emissions, these emissions can be included in the "O – Point - Other" value if the data is not disaggregated by subcategory.*
1.9 – Point - Other	O – Point - Other *Note that further disaggregation is possible under the WISE SoE Emissions data flow. A direct matching to WFD 1.9 only exist if subcategories O1, O2, O3 and O4 are reported, and if only the remainder sources are reported under the generic category "O – Point - Other".*
2 – Diffuse source of pollution	NP – Diffuse sources *Partial correspondence. Note that WFD 2.5 is included under point sources in the WISE SoE Emissions.*
2.1 – Diffuse - Urban run-off	NP4 – Diffuse - Urban run-off
2.2 – Diffuse - Agricultural	NP1 – Diffuse - Agricultural emissions
2.3 – Diffuse - Forestry	NP71 – Diffuse - Forestry emissions
2.4 – Diffuse - Transport	NP72 – Diffuse - Transport emissions

WFD pressure type	WISE SoE emissions source
2.5 – Diffuse - Contaminated sites or abandoned industrial sites	*No direct correspondence with WISE SoE Emissions sources. This type of emissions are reported under "O1 – Point - Contaminated sites or abandoned industrial sites" (or, if disaggregated values are not available, under "O – Point - Other").*
2.6 – Diffuse - Discharges not connected to sewerage network	NP3 – Diffuse - Un-connected dwellings emissions
2.8 – Diffuse - Mining	NP73 – Diffuse - Mining emissions
2.7 – Diffuse - Atmospheric deposition	NP2 – Diffuse - Atmospheric deposition
2.9 – Diffuse - Aquaculture	NP74 – Diffuse - Aquaculture emissions
2.10 – Diffuse - Other	NP7 – Diffuse - Other diffuse emissions *Partial correspondence: NP7-(NP71+NP72+NP73+NP74)+NP8*
No correspondence	NP8 – Diffuse - Background emissions

Table 2ii: Relationship between WISE SoE emissions source categories to WFD pressures

WISE SoE emissions source	WFD pressure type
PT – Point sources	1 – Point source of pollution *Note that "1.2 – Point - Storm overflows" are reported as diffuse sources under WISE SoE Emissions.*
U – Point - Urban waste water	1.1 – Point - Urban waste water
U1 – Point - Urban waste water - untreated	*No direct correspondence to this WISE SoE subcategory.*
U11 – Point - Urban waste water - untreated - less than 2000 p.e.	*No direct correspondence to this WISE SoE subcategory.*
U12 – Point - Urban waste water - untreated - between 2000 and 10000 p.e.	*No direct correspondence to this WISE SoE subcategory.*
U13 – Point - Urban waste water - untreated - between 10000 and 100000 p.e.	*No direct correspondence to this WISE SoE subcategory.*
U14 – Point - Urban waste water - untreated - more than 100000 p.e.	*No direct correspondence to this WISE SoE subcategory.*
U2 – Point - Urban waste water - treated	*No direct correspondence to this WISE SoE subcategory.*
U21 – Point - Urban waste water - treated - less than 2000 p.e.	*No direct correspondence to this WISE SoE subcategory.*
U22 – Point - Urban waste water - treated - between 2000 and 10000 p.e.	*No direct correspondence to this WISE SoE subcategory.*
U23 – Point - Urban waste water - treated - between 10000 and 100000 p.e.	*No direct correspondence to this WISE SoE subcategory.*
U24 – Point - Urban waste water - treated - more than 100000 p.e.	*No direct correspondence to this WISE SoE subcategory.*
I – Point - Industrial waste water	*Sum of:* 1.3 – Point - IED plants 1.4 – Point - Non IED plants
I3 – Point - Industrial waste water - treated	*No direct correspondence to this WISE SoE subcategory.*
I4 – Point - Industrial waste water - untreated	*No direct correspondence to this WISE SoE subcategory.*
O – Point - Other	1.9 – Point - Other *Note that further disaggregation is possible under the WISE SoE Emissions data flow. A direct matching to WFD 1.9 only exist if subcategories O1, O2, O3 and O4 are reported, and if only the remainder sources are reported under the generic category "O – Point - Other".*
O1 – Point - Contaminated sites or abandoned industrial sites	*Sum of:* 1.5 – Point - Contaminated sites or abandoned industrial sites 2.5 – Diffuse - Contaminated sites or abandoned industrial sites
O2 – Point - Waste disposal sites	1.6 – Point - Waste disposal sites
O3 – Point - Mine waters	1.7 – Point - Mine waters
O4 – Point - Aquaculture	1.8 – Point - Aquaculture
NP – Diffuse sources	2 – Diffuse source of pollution *Partial correspondence. Note that WFD 2.5 is included under point sources in the WISE SoE Emissions.*
NP1 – Diffuse - Agricultural emissions	2.2 – Diffuse - Agricultural
NP2 – Diffuse - Atmospheric deposition	2.7 – Diffuse - Atmospheric deposition
NP3 – Diffuse - Un-connected dwellings emissions	2.6 – Diffuse - Discharges not connected to sewerage network

WISE SoE emissions source	WFD pressure type
NP4 – Diffuse - Urban run-off	2.1 – Diffuse - Urban run-off
NP5 – Diffuse - Storm overflow emissions	1.2 – Point - Storm overflows
NP7 – Diffuse - Other diffuse emissions	2.10 – Diffuse - Other *Partial correspondence: NP7-(NP71+NP72+NP73+NP74)+NP8*
NP71 – Diffuse - Forestry emissions	2.3 – Diffuse - Forestry
NP72 – Diffuse - Transport emissions	2.4 – Diffuse - Transport
NP73 – Diffuse - Mining emissions	2.8 – Diffuse - Mining
NP74 – Diffuse - Aquaculture emissions	2.9 – Diffuse - Aquaculture
NP8 – Diffuse - Background emissions	*No direct correspondence.*

Annex 8: Enumeration Lists

Annex 8a: List of common intercalibration types (SWIntercalibrationType_Enum)

Code	Description
CW-BC1	Baltic Sea, surface water salinity 0.5-6 psu, bottom water salinity 1-6 psu, Exposed, 90-150 ice days
CW-BC3	Baltic Sea, surface water salinity 3-6 psu, bottom water salinity 3-6 psu, Sheltered, 90-150 ice days
CW-BC4	Baltic Sea, surface water salinity 5-8 psu, bottom water salinity 5-8 psu, Exposed, < 90 ice days
CW-BC5	Baltic Sea, surface water salinity 6-8 psu, bottom water salinity 6-12 psu, Exposed, <90 ice days
CW-BC6	Baltic Sea, surface water salinity 8-12 psu, bottom water salinity 8-12 psu, Sheltered, <90 ice days
CW-BC7	Baltic Sea, surface water salinity 6-8 psu, bottom water salinity 8-11 psu, Exposed, <90 ice days
CW-BC8	Baltic Sea, surface water salinity 13-18 psu, bottom water salinity 18-23 psu, Sheltered,<90 ice days
CW-BC9	Baltic Sea, surface water salinity 3-6 psu, bottom water salinity 3-6 psu, Moderately Exposed to exposed, 90-150 ice days
CW-BL1	Black Sea, mesohaline, microtidal, shallow, moderately exposed, mixed substratum
CW-NEA10	Skagerrak Outer Arc Type, polyhaline, microtidal, exposed, deep
CW-NEA1/26	North East Atlantic, open oceanic or enclosed seas, exposed or sheltered, euhaline, shallow (< 30 m), microtidal or mesotidal, fully mixed or partly stratified
CW-NEA3/4	North East Atlantic, polyhaline, exposed or moderately exposed (Wadden Sea type)
CW-NEA7	North East, Atlantic Sea, deep fjordic and sea loch systems
CW-NEA8a	North East Atlantic, Skagerrak Inner Arc Type, polyhaline (25-30), microtidal, moderately exposed, shallow, fully mixed
CW-NEA8b	North East Atlantic, Skagerrak Inner Arc Type, polyhaline (10-30), microtidal, moderately sheltered, shallow, partly stratified
CW-NEA9	North East Atlantic, fjord with a shallow sill at the mouth with very deep maximum depth in the central basin with poor deepwater exchange
CW-Type_I	Mediterranean, highly influenced by freshwater input
CW-Type_IIA	Mediterranean, moderately influenced by freshwater input (continent influence)
CW-Type_IIA_Adriatic	Mediterranean, moderately influenced by freshwater input (continent influence), Adriatic coast
CW-Type_IIIE	Mediterranean, not influenced by freshwater input (Eastern Basin)
CW-Type_IIIW	Mediterranean, continental coast, not influenced by freshwater input (Western Basin)
CW-Type_Island-W	Mediterranean, island coast (Western Basin)
LW-EC1	Eastern Continental, lowland, very shallow, hard-water
LW-L-AL3	Alpine, lowland or mid-altitude, deep, moderate to high alkalinity (alpine influence), large
LW-L-AL4	Alpine, mid-altitude, shallow, moderate to high alkalinity (alpine influence), large
LW-L-CB1	Central Baltic, lowland, shallow, calcareous
LW-L-CB2	Central Baltic, lowland, very shallow, calcareous
LW-L-CB3	Central Baltic, lowland, shallow, small, siliceous (moderate alkalinity)
LW-L-M5/7	Mediterranean, reservoirs, deep, large, siliceous, “wet” areas
LW-L-M8	Mediterranean, reservoirs, deep, large, calcareous
LW-L-N1	Northern, lowland, shallow, moderate alkalinity, clear
LW-L-N2a	Northern, lowland, shallow, low alkalinity, clear
LW-L-N2b	Northern, lowland, deep, low alkalinity, clear
LW-L-N3a	Northern, lowland, shallow, low alkalinity, meso-humic
LW-L-N3b	Northern, lowland, shallow, low alkalinity, polyhumic
LW-L-N5	Northern, mid-altitude, shallow, low alkalinity, clear
LW-L-N6a	Northern, mid-altitude, shallow, low alkalinity, meso-humic

LW-L-N6b	Northern, mid-altitude, shallow, low alkalinity, poly-humic
LW-L-N7	Northern, highland, shallow, siliceous, low alkalinity
LW-L-N8a	Northern, lowland, shallow, moderate alkalinity, meso-humic
LW-L-N8b	Northern, lowland, shallow, moderate alkalinity,poli-humic
LW-L-N-BF1	Northern lowland/mid-altitude, low alkalinity, clear
LW-L-N-BF2	Northern ecoregion 22, low alkalinity, clear and humic
LW-L-N-F1	Northern dimictic clear water lakes, low alkalinity
LW-L-N-F2	Northern dimictic (meso)humic water lakes, low alkalinity
LW-L-N-M 101	Northern low alkalinity, clear
LW-L-N-M 102	Northern low alkalinity, humic
LW-L-N-M 201	Northern moderate alkalinity, clear
LW-L-N-M 202	Northern moderate alkalinity, humic
LW-L-N-M 301a	Northern, high alkalinity, clear, atlantic subtype
LW-L-N-M 302a	Northern, high alkalinity, humic, atlantic subtype
RW-R-A1	Pre-alpine, small to medium, high altitude calcareous
RW-R-A2	Alpine, small to medium, high altitude, siliceous
RW-R-C1	Central/Baltic, small, lowland, siliceous sand
RW-R-C2	Central/Baltic, small, lowland, siliceous rock
RW-R-C3	Central/Baltic, small, mid-altitude, siliceous
RW-R-C4	Central/Baltic, medium, lowland, mixed
RW-R-C5	Central/Baltic, large, lowland, mixed
RW-R-C6	Central/Baltic, small, lowland, calcareous
RW-R-E1	Eastern Continental Carpathians, small to medium, mid-altitude (includes RW-R-E1a and RW-R-1b)
RW-R-E2	Eastern Continental Plains, medium-sized, lowland
RW-R-E3	Eastern Continental Plains, large, lowland
RW-R-E4	Eastern Continental Plains, medium-sized, mid-altitude
RW-R-EX4	Eastern Continental Large, mid-atitude
RW-R-EX5	Eastern Continental Plains, small, lowland
RW-R-EX6	Eastern Continental Plains, small, mid-altitude
RW-R-EX7	Eastern Continental Balkan, small, calcareous, mid-altitude
RW-R-EX8	Eastern Continental Balkan, small to medium-sized, calcareous karst spring
RW-R-L1	Very large low alkalinity (all GIGs)
RW-R-L2	Very large medium to high alkalinity (all GIGs)
RW-R-M1	Mediterranean, small, mid-altitude
RW-R-M2	Mediterranean, medium, lowland
RW-R-M3	Mediterranean, large, lowland
RW-R-M4	Mediterranean, small-medium, Mediterranean mountains
RW-R-M5	Mediterranean, small, Mediterranean temporary
RW-R-N1	Northern, small, lowland, siliceous, moderate alkalinity
RW-R-N2	Northern, small-medium, lowland, siliceous, low alkalinity, clear
RW-R-N3	Northern, small-medium, lowland, organic, low alkalinity
RW-R-N4	Northern, medium, lowland, siliceous, moderate alkalinity
RW-R-N5	Northern, small, mid-altitude, siliceous, low alkalinity
RW-R-N7	Northern, small, highland, siliceous, low alkalinity, clear
RW-R-N9	Northern, small, medium, mid-altitude, siliceous, low alkalinity, organic (humic)

TW- BT1	Baltic Sea, surface water salinity 0-8 psu, bottom water salinity 0-8 psu, very sheltered, no ice days
TW-CoastalLagoonsMesohaline	Mediterranean Sea, coastal lagoons, salinity 5-18 psu
TW-CoastalLagoonsOligohaline	Mediterranean Sea, coastal lagoons, salinity 0-5 psu
TW-CoastalLagoonsPolyeuhaline	Mediterranean Sea, coastal lagoons, Salinity 18-40 psu
TW-Estuaries	Mediterranean Sea, estuaries, salt wedge type
TW-NEA11	North East Atlantic, transitional waters
Not applicable	

Annex 8b: List of River Basin Specific Pollutants (RBSP_Enum)

CAS Number (where relevant) or EEA (SoE) code and name provided

Pollutant
CAS_100-02-7 - Nitrophenol
CAS_100-41-4 - Ethylbenzene
CAS_100-42-5 - Styrene
CAS_1002-53-5 - Dibutyltin
CAS_10028-17-8 - Tritium
CAS_10061-01-5 - c-1,3-dichloropropene
CAS_10061-02-6 - t-1,3-dichloropropene
CAS_1007-28-9 - Desisopropylatrazine
CAS_101-55-3 - 4-bromophenyl phenyl ether
CAS_1014-69-3 - Desmetryn
CAS_1024-57-3 - Heptachlor epoxide
CAS_10265-92-6 - Methamidophos
CAS_103-65-1 - n-propylbenzene
CAS_104-51-8 - n-butylbenzene
CAS_105-67-9 - 2,4-dimethyl-phenol
CAS_10599-90-3 – Chloramide
CAS_106-42-3 - P-xylene
CAS_106-43-4 - 4-chlorotoluene
CAS_106-44-5 - 4-methyl-phenol
CAS_106-46-7 - 1,4-dichlorobenzene
CAS_106-89-8 – Epichlorohydrin
CAS_106-93-4 - 1,2-dibromoethane
CAS_10605-21-7 - Carbendazim
CAS_1066-51-9 - Aminomethylphosphonic acid (AMPA)
CAS_107-13-1 - Acrylonitrile
CAS_107-46-0 - Hexamethyldisiloxane (HMDS)
CAS_1070-78-6 - 1,1,1,3-tetrachloropropane
CAS_1071-83-6 - Glyphosate
CAS_108-38-3 - M-xylene
CAS_108-67-8 - 1,3,5-trimethylbenzene
CAS_108-68-9 - 3,5-dimethyl-phenol
CAS_108-70-3 - 1,3,5-trichlorobenzene
CAS_108-86-1 - Bromobenzene
CAS_108-88-3 - Toluene
CAS_108-90-7 - Chlorobenzene
CAS_108-95-2 - Phenol
CAS_1113-02-6 - Omethoate
CAS_111988-49-9 - Thiacloprid
CAS_112410-23-8 - Tebufenozide

CAS_114-07-8 - Erythromycin
CAS_115-32-2 - Dicofol
CAS_1163-19-5 - Bis(pentabromophenyl) ether
CAS_118-96-7 - 2,4,6-trinitrotoluene
CAS_1194-65-6 - Dichlobenil
CAS_120-36-5 - Dichlorprop (2,4-DP)
CAS_120-82-1 - 1,2,4-trichlorobenzene
CAS_120-83-2 - 2,4-dichlorophenol
CAS_120928-09-8 - Fenazaquin
CAS_121-14-2 - 2,4-dinitrotoluene
CAS_121-75-5 - Malathion
CAS_122-14-5 - Fenitrothion
CAS_123-33-1 - Maleinhydrazid
CAS_123-91-1 – 1,4-Dioxane
CAS_1231244-60-2 - Metazachlor OA
CAS_124-48-1 - Dibromochlorometane
CAS_124495-18-7 - Quinoxyfen
CAS_12767-79-2 - Aroclor
CAS_128-37-0 - 2,6-Ditert-butyl-4-methylphenol
CAS_129-00-0 - Pyrene
CAS_13071-79-9 - Terbufos
CAS_131-11-3 - Dimethyl phthalate
CAS_131-16-8 - Dipropyl phthalate
CAS_131-18-0 - Dipentyl phthalate
CAS_1321-64-8 - Pentachloronaphthalene
CAS_1321-65-9 - Trichloronaphthalene
CAS_133-06-2 - Captan
CAS_133-53-9 - 2,4-Dichloro-3,5-dimethylfenol
CAS_1330-20-7 - Xylene
CAS_1333-82-0 - Cr(VI)O3
CAS_1335-87-1 - Hexachloronaphthalene
CAS_1335-88-2 - Tetrachloronaphthalene
CAS_13351-73-0 - Tolyltriazole
CAS_13356-08-6 - Fenbutatin oxide
CAS_1336-36-3 - Polychlorinated biphenyls
CAS_133855-98-8 - Epoxiconazole
CAS_134-62-3 - Diethyltoluamide (DEET)
CAS_134237-50-6 - alpha-Hexabromocyclododecane
CAS_134237-51-7 - beta-Hexabromocyclododecane
CAS_134237-52-8 - gamma-Hexabromocyclododecane
CAS_135-19-3 - 2-naphthol
CAS_135-98-8 - sec-butylbenzene
CAS_135410-20-7 - Acetamiprid

CAS_136-85-6 - Methylbenzotriazol
CAS_136426-54-5 - Fluquinconazole
CAS_136677-10-6 - Polychlorinated dibenzofurans (10 PCDFs)
CAS_13684-56-5 - Desmedipham
CAS_137-26-8 - Thiram
CAS_137-30-4 - Ziram
CAS_138261-41-3 - Imidacloprid
CAS_139-13-9 - NTA
CAS_139-40-2 - Propazine
CAS_140-57-8 - Aramite
CAS_141776-32-1 - Sulfosulfuron
CAS_142-28-9 - 1,3-dichloropropane
CAS_142363-53-9 - Alachlor ESA
CAS_14265-44-2 - Phosphate
CAS_143-50-0 - Chlordecone (Kepone)
CAS_144-49-0 - Fluoroacetic acid
CAS_14797-65-0 – Nitrite
CAS_14798-03-9 – Ammonium
CAS_14866-68-3 – Chlorates
CAS_14998-27-7 – Chlorite
CAS_151-21-3 - Sodium dodecyl sulfate
CAS_15165-67-0 - Dichlorprop-P
CAS_152019-73-3 - Metolachlor OA
CAS_15307-79-6 - Diclofenac sodium
CAS_15307-86-5 - Diclofenac
CAS_153719-23-4 - Thiamethoxam
CAS_15541-45-4 - Bromate
CAS_15545-48-9 - Chlortoluron
CAS_156-59-2 - Cis-1,2-dichloroethene
CAS_156-60-5 - Trans 1,2-dichloroethene
CAS_1563-66-2 - Carbofuran
CAS_15687-27-1 - Ibuprofen
CAS_1570-64-5 - 4-chloro-2-methylphenol
CAS_1570-65-6 - 4,6-dichloro-2-methylphenol
CAS_1610-18-0 - Prometon
CAS_16118-49-3 - Carbetamide
CAS_1634-04-4 - MTBE
CAS_16478-18-5 - Pentachloroiodobenzene
CAS_16484-77-8 - Mecoprop-P (MCPP-P)
CAS_16655-82-6 - 3-hydroxycarbofuran
CAS_16672-87-0 - 2-chloroethylphosphonic acid
CAS_16752-77-5 - Methomyl
CAS_1689-83-4 - Ioxynil

CAS_1689-84-5 - Bromoxynil
CAS_1689-99-2 - Bromoxynil octanoate
CAS_1698-60-8 - Chloridazon
CAS_16984-48-8 - Fluoride
CAS_1702-17-6 - Clopyralid
CAS_17040-19-6 - Demeton-S-methylsulfon
CAS_171118-09-5 - Metolachlor ESA
CAS_171262-17-2 - Alachlor OA
CAS_17254-80-7 - Chloridazon methyl desphenyl
CAS_172960-62-2 - Metazachlor ESA
CAS_1746-01-6 - TCDD (2,3,7,8-tetrachlorodibenzo-p-dioxin)
CAS_1763-23-1 - Perfluorooctane sulfonic acid (PFOS) and its derivatives
CAS_1806-26-4 - Octylphenol
CAS_18181-70-9 - Iodofenphos
CAS_182346-21-0 - BDE 85 (2,2’,3,4,4’-pentabromodiphenyl ether)
CAS_1825-21-4 - Pentachloroanisole
CAS_182677-30-1 - BDE 138 (2,2’,3,4,4’,5’-hexabromodiphenyl ether)
CAS_1836-75-5 - Nitrophen
CAS_18540-29-9 - Chromium VI
CAS_1861-40-1 - Benfluralin
CAS_187022-11-3 - Acetochlor ESA
CAS_189084-64-8 - BDE 100 (2,2’,4,4’,6-pentabromodiphenyl ether)
CAS_191-24-2 - Benzo(g,h,i)perylene
CAS_1912-26-1 - Trietazine
CAS_1918-00-9 - Dicamba
CAS_1918-13-4 - Chlorthiamid
CAS_193-39-5 - Indeno(1,2,3-cd)pyrene
CAS_19408-74-3 - 1,2,3,7,8,9-H6CDD
CAS_194992-44-4 - Acetochlor OA
CAS_19666-30-9 - Oxadiazon
CAS_2008-58-4 - 2,6-dichlorobenzamide
CAS_2032-65-7 - Methiocarb
CAS_20461-54-5 - Iodide
CAS_205-99-2 - Benzo(b)fluoranthene
CAS_2051-24-3 - PCB 209 (5,5’,6,6’-decachlorobiphenyl)
CAS_207-08-9 - Benzo(k)fluoranthene
CAS_207122-15-4 - BDE 154 (2,2’,4,4’,5,6’-hexabromodiphenyl ether)
CAS_208-96-8 - Acenaphthylene
CAS_2104-64-5 - Ethyl O-(p-nitrophenyl) phenyl phosphonothionate (EPN)
CAS_21087-64-9 - Metribuzin
CAS_210880-92-5 - Clothianidin
CAS_2163-68-0 - Hydroxyatrazine
CAS_2164-08-1 - Lenacil

CAS_21725-46-2 - Cyanazine
CAS_218-01-9 - Chrysene
CAS_22204-53-1 - Naproxen
CAS_2227-13-6 - Tetrasul
CAS_2234-13-1 - Octachloronaphthalene
CAS_2303-17-5 - Tri-allate
CAS_2310-17-0 - Phosalone
CAS_23103-98-2 - Pirimicarb
CAS_23593-75-1 - Clotrimazole
CAS_2385-85-5 - Mirex
CAS_23950-58-5 - Propyzamide
CAS_2440-02-0 - Heptachloronorbornene
CAS_24959-67-9 - Bromide
CAS_25057-89-0 - Bentazone
CAS_25140-90-3 - 2-(2,6-dichlorophenoxy)propionic acid (2,6-DCPP)
CAS_25167-83-3 - Tetrachlorophenols
CAS_25637-99-4 - 1,3,5,7,9,11-Hexabromocyclododecane
CAS_2599-11-3 - Hydroxysimazine
CAS_262-12-4 - Dibenzodioxin
CAS_26225-79-6 - Ethofumesate
CAS_26259-45-0 - Secbumeton
CAS_28159-98-0 - Cybutryne
CAS_29122-68-7 - Atenolol
CAS_294-62-2 - Cyclododecane
CAS_297-78-9 - Isobenzane
CAS_298-00-0 - Parathion-methyl
CAS_298-46-4 - Carbamazepin
CAS_30125-63-4 - Desethylterbuthylazine
CAS_3018-12-0 – Dichloroacetonitrile
CAS_309-00-2 - Aldrin
CAS_31218-83-4 - Propetamphos
CAS_314-40-9 - Bromacil
CAS_31508-00-6 - PCB 118 (2,3’,4,4’,5-pentachlorobiphenyl)
CAS_319-84-6 - Alpha-HCH
CAS_319-85-7 - Beta-HCH
CAS_319-86-8 - Delta-HCH
CAS_3194-55-6 - 1,2,5,6,9,10-Hexabromocyclododecane
CAS_32241-08-0 - Heptachloronaphthalene
CAS_3252-43-5 – Dibromoacetonitrile
CAS_32534-81-9 - Pentabromodiphenylether
CAS_32536-52-0 - Octabromodiphenyl ether
CAS_32598-13-3 - PCB 77 (3,3’,4,4’-tetrachlorobiphenyl)
CAS_32598-14-4 - PCB 105 (2,3,3’,4,4’-pentachlorobiphenyl)

CAS_3268-87-9 - 1,2,3,4,6,7,8,9-O8CDD
CAS_32774-16-6 - PCB 169 (3,3’,4,4’,5,5’-hexachlorobiphenyl)
CAS_330-55-2 - Linuron
CAS_3307-39-9 - 2-(4-chlorophenoxy)propionic acid (4-CPP)
CAS_33213-65-9 - Beta-Endosulfan
CAS_333-41-5 - Diazinon
CAS_335-67-1 - PFOA
CAS_33693-04-8 - Terbumeton
CAS_3380-34-5 - Triclosan
CAS_3397-62-4 - Deisopropyldeethylatrazine
CAS_3424-82-6 - o,p'-DDE
CAS_34256-82-1 - Acetochlor
CAS_35065-27-1 - PCB 153 (2,2’,4,4’,5,5’-hexachlorobiphenyl)
CAS_35065-28-2 - PCB 138 (2,2’,3,4,4’,5’-hexachlorobiphenyl)
CAS_35065-29-3 - PCB 180 (2,2’,3,4,4’,5,5’-heptachlorobiphenyl)
CAS_35065-30-6 - PCB 170 (1,2,3,4-tetrachloro-5-(2,3,4-trichlorophenyl)benzene)
CAS_35693-99-3 - PCB 52 (2,2’,5,5’-tetrachlorobiphenyl)
CAS_35694-08-7 - PCB 194 (1,2,3,4-tetrachloro-5-(2,3,4,5-tetrachlorophenyl)benzene)
CAS_35822-46-9 - 1,2,3,4,6,7,8-H7CDD
CAS_36065-30-2 - 2,4,6-tribromophenyl 2-methyl-2,3-dibromopropy ether
CAS_36355-01-8 - Hexabromobiphenyl
CAS_36483-60-0 - Hexabromodiphenylether
CAS_37350-58-6 - Metoprolol
CAS_37680-73-2 - PCB 101 (2,2’,4,5,5’-pentachlorobiphenyl)
CAS_38380-08-4 - PCB 156 (2,3,3’,4,4’,5-hexachlorobiphenyl)
CAS_39001-02-0 - 1,2,3,4,6,7,8,9-O8CDF
CAS_39227-28-6 - 1,2,3,4,7,8-H6CDD
CAS_39635-31-9 - PCB 189 (1,2,3,4-tetrachloro-5-(3,4,5-trichlorophenyl)benzene)
CAS_39765-80-5 - trans-Nonachlor
CAS_40088-47-9 - Tetrabromodiphenylether
CAS_40321-76-4 - 1,2,3,7,8-P5CDD
CAS_40487-42-1 - Pendimethalin
CAS_41318-75-6 - BDE 28 (2,4,4'-tribromodiphenyl ether)
CAS_41394-05-2 - Metamitron
CAS_41464-42-0 - PCB 72 (2,3',5,5'-Tetrachlorobiphenyl)
CAS_41859-67-0 - Bezafibrate
CAS_4234-79-1 - Kelevan
CAS_42576-02-3 - Bifenox
CAS_4636-83-3 - Morfamquat
CAS_465-73-6 - Isodrin
CAS_4901-51-3 - 2,3,4,5-tetrachlorophenol
CAS_4904-61-4 - 1,5,9-cyclododecatriene
CAS_50-00-0 - Formaldehyde

CAS_50-28-2 - 17beta-estradiol (E2)
CAS_50-30-6 - 2,6-dichlorobenzoic acid
CAS_50563-36-5 - Dimethachlor
CAS_506-77-4 – Cyanogen chloride
CAS_51000-52-3 - Vinyl neodecanoate
CAS_512-04-9 - Diosgenin
CAS_51207-31-9 - 2,3,7,8-T4CDF
CAS_51218-45-2 - Metolachlor
CAS_51235-04-2 - Hexazinone
CAS_52-51-7 - Bronopol
CAS_52236-30-3 - Desamino-diketo-metribuzin
CAS_52315-07-8 - Cypermethrin
CAS_526-75-0 - 2,3-dimethyl-phenol
CAS_52645-53-1 - Permethrin-cis+trans
CAS_52663-72-6 - PCB 167 (1,2,3-trichloro-5-(2,4,5-trichlorophenyl)benzene)
CAS_53-16-7 - Estrone (E1)
CAS_53-19-0 - o,p'-DDD
CAS_53-70-3 - Dibenzo(a,h)anthracene
CAS_534-52-1 - Dinitro-o-cresol (DNOC)
CAS_540-59-0 - 1,2-dichloroethene
CAS_541-73-1 - 1,3-dichlorobenzene
CAS_542-75-6 – 1,3-Dichloropropene
CAS_5436-43-1 - BDE 47 (2,2’,4,4’-tetrabromodiphenyl ether)
CAS_5466-77-3 - 2-Ethylhexyl 4-methoxycinnamate
CAS_55512-33-9 - Pyridate
CAS_55525-54-7 - 3,3’-(ureylenedimethylene)bis(3,5,5’- trimethylcyclohexyl) diisocyanate
CAS_55673-89-7 - 1,2,3,4,7,8,9-H7CDF
CAS_5598-13-0 - Chlorpyrifos-methyl
CAS_56-38-2 - Parathion
CAS_56-55-3 – Benzo(a)anthracene
CAS_563-58-6 - 1,1-dichloropropene
CAS_56507-37-0 - Diketo-metribuzin
CAS_57-12-5 – Free cyanide
CAS_57-63-6 - 17alpha-ethinylestradiol (EE2)
CAS_57-74-9 - Chlordane
CAS_57117-31-4 - 2,3,4,7,8-P5CDF
CAS_57117-41-6 - 1,2,3,7,8-P5CDF
CAS_57117-44-9 - 1,2,3,6,7,8-H6CDF
CAS_57465-28-8 - PCB 126 (3,3’,4,4’,5-pentachlorobiphenyl)
CAS_576-26-1 - 2,6-dimethyl-phenol
CAS_57653-85-7 - 1,2,3,6,7,8-H6CDD
CAS_57837-19-1 - Metalaxyl
CAS_58-08-2 - Caffeine

CAS_58-89-9 - Gamma-HCH (Lindane)
CAS_58-90-2 - 2,3,4,6-tetrachlorophenol
CAS_59-50-7 - 3-methyl-4-chlorophenol
CAS_5915-41-3 - Terbuthylazine
CAS_594-20-7 - 2,2-dichloropropane
CAS_59473-04-0 - AOX
CAS_60-00-4 - EDTA
CAS_60-51-5 - Dimethoate
CAS_60-57-1 - Dieldrin
CAS_60145-21-3 - PCB 103 (2,2',4,5',6-pentachlorobiphenyl)
CAS_60207-90-1 - Propiconazole
CAS_603-35-0 - Triphenyl phosphine
CAS_60348-60-9 - BDE 99 (2,2’,4,4’,5-pentabromodiphenyl ether)
CAS_60851-34-5 - 2,3,4,6,7,8-H6CDF
CAS_6108-10-7 - Epsilon-HCH
CAS_6164-98-3 - Chlordimeform
CAS_6190-65-4 - Desethylatrazine
CAS_62-73-7 - Dichlorvos
CAS_630-20-6 - 1,1,1,2-tetrachloroethane
CAS_6339-19-1 - Chloridazon desphenyl
CAS_64743-03-9 - Phenols
CAS_64902-72-3 - Chlorsulfuron
CAS_65510-44-3 - PCB 123 (1,2,3-trichloro-5-(2,4-dichlorophenyl)benzene)
CAS_66753-07-9 - Hydroxyterbuthylazine
CAS_67129-08-2 - Metazachlor
CAS_67562-39-4 - 1,2,3,4,6,7,8-H7CDF
CAS_67564-91-4 - Fenpropimorph
CAS_68631-49-2 - BDE 153 (2,2’,4,4’,5,5’-hexabromodiphenyl ether)
CAS_68928-80-3 - BDE 183 (Heptabromodiphenylether)
CAS_69782-90-7 - PCB 157 (2,3,3’,4,4’,5’-hexachlorobiphenyl)
CAS_7012-37-5 - PCB 28 (2,4,4’-trichlorobiphenyl)
CAS_70124-77-5 - Flucythrinate
CAS_70362-41-3 - PCB 106 (2,3,3',4,5'-pentachlorobiphenyl)
CAS_70362-50-4 - PCB 81 (3,4,4',5-tetrachlorobiphenyl)
CAS_70630-17-0 - Metalaxyl-M
CAS_70648-26-9 - 1,2,3,4,7,8-H6CDF
CAS_70776-03-3 - Naphthalene, chloro derivatives
CAS_7085-19-0 - Mecoprop
CAS_71-55-6 - 1,1,1-trichloroethane
CAS_72-20-8 - Endrin
CAS_72-43-5 - Methoxychlor
CAS_72-54-8 - p,p'-DDD
CAS_72-55-9 - p,p'-DDE

CAS_723-46-6 - Sulfamethoxazol
CAS_7286-69-3 - Sebuthylazine
CAS_7287-19-6 - Prometryn
CAS_72918-21-9 - 1,2,3,7,8,9-H6CDF
CAS_732-26-3 - 2,4,6-tri-tert-butylphenol
CAS_738-70-5 - Trimethoprim
CAS_74-83-9 - Bromomethane
CAS_74-90-8 - Hydrogen cyanide
CAS_74-95-3 - Dibromomethane
CAS_74-97-5 - Bromochloromethane
CAS_74070-46-5 - Aclonifen
CAS_74223-64-6 - Metsulfuronmethyl
CAS_7429-90-5 - Aluminium and its compounds
CAS_7439-89-6 - Iron and its compounds
CAS_7439-93-2 - Lithium
CAS_7439-95-4 - Magnesium
CAS_7439-96-5 - Manganese and its compounds
CAS_7439-98-7 - Molybdenum and its compounds
CAS_7440-09-7 - Potassium
CAS_7440-22-4 - Silver
CAS_7440-23-5 - Sodium
CAS_7440-24-6 - Strontium
CAS_7440-28-0 - Thallium
CAS_7440-31-5 - Tin and its compounds
CAS_7440-32-6 - Titanium
CAS_7440-33-7 - Tungsten and its compounds
CAS_7440-36-0 - Antimony
CAS_7440-38-2 - Arsenic and its compounds
CAS_7440-39-3 - Barium
CAS_7440-41-7 - Beryllium
CAS_7440-42-8 - Boron
CAS_7440-47-3 - Chromium and its compounds
CAS_7440-48-4 - Cobalt and its compounds
CAS_7440-50-8 - Copper and its compounds
CAS_7440-61-1 - Uranium
CAS_7440-62-2 - Vanadium and its compounds
CAS_7440-66-6 - Zinc and its compounds
CAS_7440-70-2 - Calcium
CAS_74472-37-0 - PCB 114 (2,3,4,4',5-pentachlorobiphenyl)
CAS_75-01-4 - Chloroethene (vinylchloride)
CAS_75-25-2 - Bromoform
CAS_75-27-4 - Bromodichloromethane
CAS_75-34-3 - 1,1-dichloroethane

CAS_75-35-4 - 1,1-dichloroethene
CAS_75-69-4 - Trichlorofluoromethane
CAS_75-71-8 - Dichlorodifluoromethane
CAS_75-99-0 - Dalapon
CAS_76-03-9 - Trichloroacetic acid
CAS_76-44-8 - Heptachlor
CAS_7664-41-7 – Ammonia
CAS_77-47-4 - Hexachlorocyclopentadiene (HCCP)
CAS_77238-39-2 – Microcystin
CAS_7782-41-4 - Fluorine
CAS_7782-49-2 - Selenium and its compounds
CAS_7783-06-4 - Hydrogen sulphide
CAS_7790-93-4 – Chloric acid
CAS_78-87-5 - 1,2-dichloropropane
CAS_789-02-6 - DDT, o,p'
CAS_79-00-5 - 1,1,2-trichloroethane
CAS_79-06-1 – Acrylamide
CAS_79-34-5 - 1,1,2,2-tetrachloroethane
CAS_79-43-6 – Dichloroacetic acid
CAS_79-94-7 - Tetrabromobisphenol A (TBBP-A)
CAS_793-24-8 - 4-(dimethylbutylamino) diphenylamin (6PPD)
CAS_80-05-7 - Bisphenol A
CAS_8001-35-2 - Toxaphene
CAS_81-15-2 - Musk xylene
CAS_81103-11-9 - Clarithromycin
CAS_82-68-8 - Quintozene
CAS_83-32-9 - Acenaphthene
CAS_83164-33-4 - Diflufenican
CAS_834-12-8 - Ametryn
CAS_83905-01-5 - Azitromycin
CAS_84-66-2 - Di-ethyl phthalate
CAS_84-69-5 - Di-iso-butyl phthalate
CAS_84-74-2 - Dibutylphthalate
CAS_84852-15-3 - 4-nonylphenol, branched
CAS_85-01-8 - Phenanthrene
CAS_85-22-3 - Pentabromoethylbenzene
CAS_85-68-7 - Butyl benzyl phthalate (BBP)
CAS_85535-85-9 - Chloroalkanes C14-17,MCCP
CAS_86-73-7 - Fluorene
CAS_87-61-6 - 1,2,3-trichlorobenzene
CAS_87-65-0 - 2,6-dichlorophenol
CAS_88-06-2 - 2,4,6-trichlorophenol
CAS_88-85-7 - Dinoseb

CAS_886-50-0 - Terbutryn
CAS_90-12-0 - 1-methylnaphthalene
CAS_9016-45-9 – Nonylphenol ethoxylate
CAS_91-57-6 - 2-methylnaphthalene
CAS_919-86-8 - Demeton-S-methyl
CAS_93-72-1 - Fenoprop
CAS_93-76-5 - 2,4,5-T
CAS_94-74-6 - MCPA
CAS_94-75-7 - 2,4-dichlorophenoxyacetic acid, 2-4 D
CAS_94-81-5 - MCPB
CAS_94-82-6 - 2,4-DB
CAS_95-14-7 - Benzotriazol
CAS_95-47-6 - O-xylene
CAS_95-48-7 - 2-methyl-phenol
CAS_95-49-8 - 2-chlorotoluene
CAS_95-50-1 - 1,2-dichlorobenzene
CAS_95-63-6 - 1,2,4-trimethylbenzene
CAS_95-65-8 - 3,4-dimethyl-phenol
CAS_95-87-4 - 2,5-dimethylphenol
CAS_95-95-4 - 2,4,5-trichlorophenol
CAS_959-98-8 - Alpha-Endosulfan
CAS_96-12-8 - 1,2-dibromo-3-chloropropane
CAS_96-18-4 - 1,2,3-trichloropropane
CAS_96-45-7 - Ethylenethiourea (ETU)
CAS_98-06-6 - tert-butylbenzene
CAS_98-51-1 - 4-tert-butyltoluene
CAS_98-82-8 - Isopropylbenzene
CAS_99-87-6 - 4-isopropyltoluene
CAS_994-05-8 - TAME
EEA_00-00-0 - Other chemical parameter
EEA_31-02-7 - Total suspended solids
EEA_33-01-2 - Alkalised benzene
EEA_33-02-3 - Benzol
EEA_33-04-5 - Brominated flame retardants
EEA_33-05-6 - BTEX
EEA_33-06-7 - Chlorinated benzene
EEA_33-07-8 - Chlorinated phenol
EEA_33-08-9 - Chromium 3+
EEA_33-09-0 - Detergents
EEA_33-10-3 - Dichlorobenzene
EEA_33-11-4 - Dichlorophenol
EEA_33-13-6 - DOX
EEA_33-14-7 - Extractable organically bound chlorine

EEA_33-15-8 - Halogenated organic compounds
EEA_33-17-0 - Hydrocarbons
EEA_33-18-1 - Meta xylene + para xylene
EEA_33-19-2 - Mono basic phenols
EEA_33-20-5 - Monochlorophenols
EEA_33-21-6 - Nitrobenzene
EEA_33-22-7 - Oil fractions (C10-40)
EEA_33-23-8 - Petroleum hydrocarbons
EEA_33-24-9 - Petroleum products
EEA_33-26-1 - Polychlorinated dibenzodioxins (PCDD)
EEA_33-27-2 - Radionuclides
EEA_33-28-3 - Surfactants (anionic and nonionic)
EEA_33-29-4 - Surfactants (anionic)
EEA_33-31-8 - Total chrysene + triphenylene
EEA_33-32-9 - Total DDD (DDD, o,p' + DDD, p,p')
EEA_33-36-3 - Total hydrocarbons
EEA_33-38-5 - Polychlorinated biphenyls(7 PCB: 28,52,101,118,138,153,180)
EEA_33-41-0 - Total tri-, tetra- and pentachlorophenol
EEA_33-42-1 - Total trichloroethylene + tetrachloroethylene
EEA_33-43-2 - Total trihalomethanes
EEA_33-44-3 - Total highly volatile halogenated hydrocarbons
EEA_33-45-4 - Volatile halogenated hydrocarbons (VHH)
EEA_33-46-5 - Volatile organic halogens (VOX)
EEA_33-50-1 - Heptachlor and heptachlor epoxide
EEA_33-51-2 - Total macrolide antibiotics (erythromycin + clarithromycin + azithromycin)
EEA_33-52-3 - Total neonicotinoid insecticides (imidacloprid + thiacloprid + thiamethoxam + clothianidin + acetamiprid)
EEA_33-53-4 - Total Estrone (E1) + 17beta-estradiol (E2)
EEA_33-54-5 - Dioxin-like polychlorinated biphenyls (12 PCB-DLs: 77,81,105,114,118,123,126,156,157,167,169,189)
EEA_33-55-6 - Octylphenols (CAS 1806-26-4) including isomer 4-(1,1',3,3'-tetramethylbutyl)-phenol (CAS 140-66-9)
EEA_33-56-7 - Total PAHs (Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(g,h,i)perylene, Indeno(1,2,3-cd)pyrene)
EEA_33-57-8 - Hexabromocyclododecanes (HBCDD)
EEA_33-58-9 - Dioxins and dioxin-like compounds (7 PCDDs + 10 PCDFs + 12 PCB-DLs)
EEA_33-64-7 – Total cyanide

Annex 8c: List of additional pollutants and indicators of pollution

(AdditionalPollutant_Enum)

CAS Number (where relevant) or EEA (SoE) code and name provided

Pollutant and indicator of pollution
CAS_14797-55-8 - Nitrate
CAS_16887-00-6 - Chloride
CAS_18785-72-3 - Sulphate
CAS_71-52-3 - Hydrogen Carbonate (Bicarbonate) HCO3
CAS_7723-14-0 - Total phosphorus
EEA_31-01-6 - Hardness
EEA_3112-01-4 - Turbidity
EEA_3121-01-5 - Water temperature
EEA_3132-01-2 - Dissolved oxygen
EEA_3133-01-5 - BOD5
EEA_3133-02-6 - BOD7
EEA_3133-03-7 - CODCr
EEA_3133-04-8 - CODMn
EEA_3133-06-0 - Total organic carbon (TOC)
EEA_3142-01-6 - Electrical conductivity
EEA_3152-01-0 - pH
EEA_3153-01-3 - Acid neutralizing capacity to pH 4.5
EEA_31615-01-7 - Total nitrogen
EEA_34-01-5 - Pesticides (Active substances in pesticides, including their relevant metabolites, degradation and reaction products)

Annex 8d: List of Priority Substances (PS_Enum)

CAS Number (where relevant) or EEA (SoE) code and name provided.

Priority substance
CAS_104-40-5 - 4-nonylphenol
CAS_107-06-2 - 1,2-Dichloroethane
CAS_115-29-7 - Endosulfan
CAS_117-81-7 - Di(2-ethylhexyl)phthalate (DEHP)
CAS_118-74-1 - Hexachlorobenzene
CAS_12002-48-1 - Trichlorobenzenes (all isomers)
CAS_120-12-7 - Anthracene
CAS_122-34-9 - Simazine
CAS_127-18-4 - Tetrachloroethylene
CAS_140-66-9 - Octylphenol (4-(1,1',3,3'-tetramethylbutyl)-phenol)
CAS_1582-09-8 - Trifluralin
CAS_15972-60-8 - Alachlor
CAS_1912-24-9 - Atrazine
CAS_206-44-0 - Fluoranthene
CAS_2921-88-2 - Chlorpyrifos
CAS_330-54-1 - Diuron
CAS_34123-59-6 - Isoproturon
CAS_36643-28-4 - Tributyltin-cation
CAS_470-90-6 - Chlorfenvinphos
CAS_50-29-3 - DDT, p,p'
CAS_50-32-8 - Benzo(a)pyrene
CAS_56-23-5 - Carbon tetrachloride
CAS_608-73-1 - Hexachlorocyclohexane
CAS_608-93-5 - Pentachlorobenzene
CAS_67-66-3 - Trichloromethane
CAS_71-43-2 - Benzene
CAS_7439-92-1 - Lead and its compounds
CAS_7439-97-6 - Mercury and its compounds
CAS_7440-02-0 - Nickel and its compounds
CAS_7440-43-9 - Cadmium and its compounds
CAS_75-09-2 - Dichloromethane
CAS_79-01-6 - Trichloroethylene
CAS_85535-84-8 - Chloroalkanes C10-13
CAS_87-68-3 - Hexachlorobutadiene
CAS_87-86-5 - Pentachlorophenol
CAS_91-20-3 - Naphthalene
EEA_32-02-0 - Total cyclodiene pesticides (aldrin + dieldrin + endrin + isodrin)
EEA_32-03-1 - Total DDT (DDT, p,p' + DDT, o,p' + DDE, p,p' + DDD, p,p')
EEA_32-04-2 - Brominated diphenylethers (congener numbers 28, 47, 99, 100, 153 and 154)
EEA_32-23-5 - Total Benzo(b)fluor-anthene (CAS_205-99-2) + Benzo(k)fluor-anthene (CAS_207-

08-9)
EEA_32-24-6 - Total Benzo(g,h,i)-perylene (CAS_191-24-2) + Indeno(1,2,3-cd)-pyrene (CAS_193-39-5)

Annex 8e: List of chemical substances (ChemicalSubstances_Union_Enum)

Built merging List of pollutants and indicators of pollution in groundwater (AdditionalPollutant_Enum, Annex 8c), Priority Substances (PS_Enum, Annex 8d) and River Basin Specific Pollutants (RBSP_Enum: Annex 8b)

Annex 8f: List of units of measurement (UnitOfMeasure_Enum)

Unit of measure	Description
ug/L	Micrograms per litre
mg/L	Milligrams per litre
mg{N}/L	Milligrams nitrogen per litre
mg{NO2}/L	Milligrams nitrite per litre
mg{NO3}/L	Milligrams nitrate per litre
mg{NH3}/L	Milligrams NH3 per litre
mg{NH4}/L	Milligrams NH4 per litre
mg{P}/L	Milligrams phosphorus per litre
mg{PO4}/L	Milligrams phosphate per litre
%{oxygenSaturation}	Percentage saturation (dissolved oxygen)
m	Meter
Cel	Degrees Celsius
{PSU}	Practical salinity unit
uS/cm	Microsiemens per centimeter (conductivity)
t/a	Tonnes per year
kg/a	Kilogrammes per year
mg/kg	Milligrams per kilogram
umol/L	Micromole per litre
ug{TEQ}/kg	Micrograms TEQ per kilogram
[pH]	pH (acidity or basicity)
{other}	

Annex 8g: List of exemption types for surface water, groundwater quantitative status and protected areas (ExemptionType_Enum)

Exemption type
Article4(4) - Technical feasibility
Article4(4) - Disproportionate cost
Article4(4) - Natural conditions
Article4(5) - Technical feasibility
Article4(5) - Disproportionate cost
Article4(6) - Natural causes
Article4(6) - Force Majeure
Article4(6) - Accidents
Article4(7) - New modification
Article4(7) - Sustainable human development
No exemption

List of exemption types for groundwater chemical status (GWChemicalExemptionType_Union_Enum)

Categories in ExemptionType_Enum above plus:

Groundwater chemical exemption type
GWD Article 6(3) - Accidents / exceptional circumstances
GWD Article 6(3) - Artificial recharge / augmentation
GWD Article 6(3) - Direct discharges
GWD Article 6(3) - Interventions in surface waters
GWD Article 6(3) - Measures: disproportionate cost
GWD Article 6(3) - Measures: increased risk
GWD Article 6(3) - Small discharges

Annex 8h: Quality elements

StatusQE_Enum

StatusQE element
QE1-1 – Phytoplankton
QE1-2 – Other aquatic flora
QE1-2-1 – Macroalgae
QE1-2-2 – Angiosperms
QE1-2-3 – Macrophytes
QE1-2-4 – Phytobenthos
QE1-3 – Benthic invertebrates
QE1-4 – Fish
QE2-1 – Hydrological or tidal regime
QE2-2 – River continuity conditions
QE2-3 – Morphological conditions
QE3-1-1 – Transparency conditions
QE3-1-2 – Thermal conditions
QE3-1-3 – Oxygenation conditions
QE3-1-4 – Salinity conditions
QE3-1-5 – Acidification status
QE3-1-6-1 – Nitrogen conditions
QE3-1-6-2 – Phosphorus Conditions
QE3-3 – River Basin Specific Pollutants

BQE_Enum

BQE element
QE1-1 – Phytoplankton
QE1-2 – Other aquatic flora
QE1-2-1 – Macroalgae
QE1-2-2 – Angiosperms
QE1-2-3 – Macrophytes
QE1-2-4 – Phytobenthos
QE1-3 – Benthic invertebrates
QE1-4 – Fish
QE1-5 – Other species

SupportingQE_Enum

Supporting QE element
QE2-1 – Hydrological or tidal regime
QE2-2 – River continuity conditions
QE2-3 – Morphological conditions
QE3-1-1 – Transparency conditions
QE3-1-2 – Thermal conditions
QE3-1-3 – Oxygenation conditions
QE3-1-4 – Salinity conditions
QE3-1-5 – Acidification status
QE3-1-6 – Nutrient conditions

PhysChemQE_Enum

PhysChem QE element
QE3-1-1-1 – Secchi disk depth
QE3-1-1-2 – Other determinand for transparency
QE3-1-2-1 – Water temperature (Celsius)
QE3-1-2-2 – Other determinand for thermal conditions
QE3-1-3-1 – Oxygen saturation (%)
QE3-1-3-2 – Dissolved oxygen (mg/l)
QE3-1-3-3 – Other determinand for oxygenation conditions
QE3-1-4-1 – Practical salinity units
QE3-1-4-2 – Other determinand for salinity
QE3-1-5-1 – Acid neutralising capacity
QE3-1-5-2 – pH
QE3-1-5-3 – Other determinand for acidification status
QE3-1-6-1-1 – Nitrate
QE3-1-6-1-2 – Nitrite
QE3-1-6-1-3 – Non-ionised Ammonia
QE3-1-6-1-4 – Ammonium
QE3-1-6-1-5 – Total Nitrogen
QE3-1-6-2-1 – Orthophosphate
QE3-1-6-2-2 – Total Phosphorous
QE3-1-6-3 – Silicate
QE3-1-6-4 – Other determinand for nutrient conditions

The enumeration list QualityElement_Enum is the union of StatusQE_Enum, BQE_Enum, SupportingQE_Enum and PhysChemQE_Enum, with the exception of the choice 'QE3-1-6 – Nutrient conditions'.

Annex 8i: List of monitoring purposes (MonitoringPurpose_Enum)

Monitoring purpose
AGR – Groundwater abstraction site for irrigation
BWD – Recreational or bathing water - WFD Annex IV.1.iii
CHE – Chemical status
DRI – Groundwater abstraction site for human consumption
DWD – Drinking water - WFD Annex IV.1.i
ECO – Ecological status
HAB – Protection of habitats or species depending on water - WFD Annex IV.1.v
IND – Groundwater abstraction site for industrial supply
INT – International network of other international convention
INV – Investigative monitoring
MSF – Marine Strategy Framework Directive monitoring network
NID – Nutrient sensitive area under the Nitrates Directive - WFD Annex IV.1.iv
OPE – Operational monitoring
QUA – Quantitative status
REF – Reference network monitoring site
RIV – International network of a river convention (including bilateral agreements)
SEA – International network of a sea convention
SHE – Shellfish designated waters - WFD Annex IV.1.ii
SOE – EIONET State of Environment monitoring
SUR – Surveillance monitoring
TRE – Chemical trend assessment
UWW – Nutrient sensitive area under the Urban Waste Water Treatment Directive - WFD Annex IV.1.iv

Annex 8j: List of language codes (LanguageCode_Enum)

Taken from http://inspire.ec.europa.eu/documents/Metadata/MD_IR_and_ISO_20131029.pdf
Chapter 2.2.7 Resource language, page 26: Codelist (See ISO/TS 19139) based on alpha-3 codes of ISO 639-2. Use only three-letter codes from in ISO 639-2/B (bibliographic codes)

Language code	Language
bul	Bulgarian
hrv	Croatian
cze	Czech
dan	Danish
dut	Dutch
eng	English
est	Estonian
fin	Finnish
fre	French
ger	German
gre	Greek
hun	Hungarian
gle	Irish
ita	Italian
lav	Latvian
lit	Lithuanian
mlt	Maltese
nor	Norwegian
pol	Polish
por	Portuguese
rum	Romanian
slo	Slovak
slv	Slovenian
spa	Spanish
swe	Swedish

The list of all the codes is defined at http://www.loc.gov/standards/iso639-2/.

Annex 8k: List of roles (Roles_Enum)

Role
Pressure and impact analysis
Economic analysis
Monitoring of surface water
Monitoring of groundwater
Assessment of status of surface water
Assessment of status of groundwater
Preparation of RBMP
Preparation of PoM
Implementation of measures
Public participation
Enforcement of regulations
Co-ordination of implementation
Reporting to the European Commission

Annex 8l: List of geographical scales (GeographicalScale_Enum)

Geographical scale
NAT – National scale
REG – Regional (sub-national)
LOC – Local/municipality
INT – International RBD
RBD – RBD
SU – Sub-unit
WB – Water body
OTH – Other

Annex 8m: List of mitigation measures (MitigationMeasure_Enum)

Mitigation measure
Fish ladders
Bypass channels
Habitat restoration, building spawning and breeding areas
Sediment / debris management
Removal of structures: weirs, barriers, bank reinforcement
Reconnection of meander bends or side arms
Lowering of river banks
Restoration of bank structure
Channel narrowing
Setting of ecological flows
Inundation of flood plains
Operational modifications for hydro-peaking
Dredging minimisation and/or modification
Restoration of modified bed structure
Retention basins

Annex 8n: List of input pollutant categories (InputCategory_Union_Enum)

Union of the list of WFD pressure inventory categories (WFDPressureCategory_Enum), SoE emissions inventory categories (SoEEmissionsCategory_Enum) and CIS inventory guidance categories (CISInventoryGuidanceCategory_Enum).

WFDPressureCategory_Enum

WFD pressure inventory category
1.1 – Point - Urban waste water
1.2 – Point - Storm overflows
1.3 – Point - IED plants
1.4 – Point - Non IED plants
1.5 – Point - Contaminated sites or abandoned industrial sites
1.6 – Point - Waste disposal sites
1.7 – Point - Mine waters
1.8 – Point - Aquaculture
1.9 – Point - Other
2.1 – Diffuse - Urban run-off
2.10 – Diffuse - Other
2.2 – Diffuse - Agricultural
2.3 – Diffuse - Forestry
2.4 – Diffuse - Transport
2.5 – Diffuse - Contaminated sites or abandoned industrial sites
2.6 – Diffuse - Discharges not connected to sewerage network
2.7 – Diffuse - Atmospheric deposition
2.8 – Diffuse - Mining
2.9 – Diffuse - Aquaculture

SoEEmissionsCategory_Enum

SoE emissions inventory category
D0 – Point - Direct emissions to coastal and transitional waters
I – Point - Industrial waste water
I3 – Point - Industrial waste water - treated
I4 – Point - Industrial waste water - untreated
NP – Diffuse sources
NP0 – Diffuse - Direct emissions to coastal and transitional waters
NP1 – Diffuse - Agricultural emissions
NP10 – Diffuse - Transport emissions
NP11 – Diffuse - Mining emissions
NP12 – Diffuse - Aquaculture emissions
NP2 – Diffuse - Atmospheric deposition
NP3 – Diffuse - Un-connected dwellings emissions
NP5 – Diffuse - Storm overflow emissions
NP7 – Diffuse - Other diffuse emissions
NP8 – Diffuse - Background emissions

NP9 – Diffuse - Forestry emissions
O – Point - Other
O1 – Point - Contaminated sites or abandoned industrial sites
O2 – Point - Waste disposal sites
O3 – Point - Mine waters
O4 – Point - Aquaculture
PT – Point sources
U – Point - Urban waste water
U1 – Point - Urban waste water - untreated
U11 – Point - Urban waste water - untreated - less than 2000 p.e.
U12 – Point - Urban waste water - untreated - between 2000 and 10000 p.e.
U13 – Point - Urban waste water - untreated - between 10000 and 100000 p.e.
U14 – Point - Urban waste water - untreated - more than 100000 p.e.
U2 – Point - Urban waste water - treated
U21 – Point - Urban waste water - treated - less than 2000 p.e.
U22 – Point - Urban waste water - treated - between 2000 and 10000 p.e.
U23 – Point - Urban waste water - treated - between 10000 and 100000 p.e.
U24 – Point - Urban waste water - treated - more than 100000 p.e.

CISInventoryGuidanceCategory_Enum

CIS inventory category
P1 – Air emissions - atmospheric deposition to surface waters
P10 – Industrial waste water - treated
P11 – Mining areas - direct discharges
P12 – Inland navigation - direct discharge
P13 – Natural background
P2 – Soil - erosion to surface waters
P3 – Soil - surface run off from unsealed areas to surface waters
P4 – Soil - interflow, tile drainage and groundwater flow to surface waters
P5 – Agriculture - discharges and drifting directly to surface waters
P6 – Impermeable surfaces - surface run off from sealed areas directly to surface waters
P7 – Sewer system - storm water outlets, combined sewer overflows and unconnected sewers
P8 – Urban waste water - treated
P9 – Households - Individual discharges treated and untreated
RLin – Riverine load into RBD or SU
RLout – Riverine load out of RBD or SU
S1 – Air emissions
S10 – Inland navigation
S11 – Natural background
S12 – Impermeable surfaces
S13 – Sewer system
S14 – Urban waste water treatment plants
S15 – Industrial waste treatment plants
S2 – Soil
S3 – Groundwater

S4 – Agriculture
S5 – Transportation and infrastructure
S6 – Construction material
S7 – Households
S8 – Industry
S9 – Abandoned mines and historic mines

Annex 8o: List of calculation methods for water quantity (WQCalculationMethod_Enum)

Calculation method for water quantity
Water quantity use data not available
Water quantity use not relevant or not significant
Based on direct measurements / monitoring
Assimilation and processing (e.g. aggregation, extrapolation, clipping, etc.) from statistical data at different spatial scale (e.g. NUTS, Country level).
Based on local surveys and statistical sampling
Based on process-based deterministic hydrological and water balance modelling
Based on stochastic hydrological and water balance modelling
Empirical modelling and/or proxy values (e.g. based on water-rights allocation and permits, average water production, water supply deliveries, data from wastewater treatment plans, etc)
Calculated based on theoretical water needs and theoretical consumption values
Estimated based on established water-use coefficients and ancillary data
Estimated based on representative indicators (e.g. % deviation from the theoretical streamflow regime as an indicator of water balance, water demand as an indicator of water abstraction, etc)
For WEI+ which method has been used for estimation of renewable water resources: Option 1. RWR = ExIn + P - Eta - Snat Option 2. RWR = Outflow + (Abstraction - Return) - Sart
Other method, not included in the list

Annex 8p: List of Indicators for Pressure (IndicatorPressure_Enum)

Indicator pressure
PA01 – Area (km^2) of agricultural land at risk of soil erosion
PA02 – Area (km^2) of forest land at risk of soil erosion
PA03 – Area (km^2) of forest land affected by pressures preventing the achievement of objectives
PA04 – Area (km^2) of groundwater bodies not achieving objectives because of alteration of water levels/volumes
PA05 – Area (km^2) of groundwater bodies not achieving objectives because of groundwater recharges
PA06 – Area (km^2) of water bodies where diffuse urban run off is preventing the achievement of objectives
PA07 – Area (km^2) of water bodies where hydromorphological alterations for agricultural purposes are preventing the achievement of objectives
PA08 – Area (km^2) of water bodies where hydromorphological alterations for aquaculture purposes are preventing the achievement of objectives
PA09 – Area (km^2) of water bodies where hydromorphological alterations for hydropower production are preventing the achievement of objectives
PA10 – Area (km^2) of water bodies where hydromorphological alterations for other purposes are preventing the achievement of objectives
PA11 – Area (km^2) of water bodies where hydromorphological alterations for public water supply purposes are preventing the achievement of objectives
PA12 – Area (km^2) of water bodies where hydromorphological alterations for transport purposes are preventing the achievement of objectives
PA13 – Area (km^2) of water bodies where other anthropogenic pressures are preventing the

achievement of objectives
PA14 – Area (km^2) of water bodies where physical loss of habitats is preventing the achievement of objectives
PA15 – Area (km^2) of water bodies where the exploitation/removal of animals/plants is preventing the achievement of objectives
PA16 – Area (km^2) of water bodies where unknown pressures are preventing the achievement of objectives
PE01 – Load (tonne per year) of BOD to be reduced to achieve objectives
PE02 – Load (tonne per year) of nitrogen to be reduced to achieve objectives
PE03 – Load (tonne per year) of phosphorus to be reduced to achieve objectives
PE04 – Load (tonne per year) of sediment to be reduced to achieve objectives
PE05 – Load (tonne per year) of priority substances to be reduced to achieve objectives
PL01 – Length (km) of water bodies where diffuse urban run off is preventing the achievement of objectives
PL02 – Length (km) of water bodies where hydromorphological alterations for agricultural purposes are preventing the achievement of objectives
PL03 – Length (km) of water bodies where hydromorphological alterations for aquaculture purposes are preventing the achievement of objectives
PL04 – Length (km) of water bodies where hydromorphological alterations for flood protection are preventing the achievement of objectives
PL05 – Length (km) of water bodies where hydromorphological alterations for hydropower production are preventing the achievement of objectives
PL06 – Length (km) of water bodies where hydromorphological alterations for other purposes are preventing the achievement of objectives
PL07 – Length (km) of water bodies where hydromorphological alterations for public water supply purposes are preventing the achievement of objectives
PL08 – Length (km) of water bodies where hydromorphological alterations for transport purposes are preventing the achievement of objectives
PL09 – Length (km) of water bodies where hydromorphological alterations for unknown purposes are preventing the achievement of objectives
PL10 – Length (km) of water bodies where litter or fly tipping are preventing the achievement of objectives
PL11 – Length (km) of water bodies where other anthropogenic pressures are preventing the achievement of objectives
PL12 – Length (km) of water bodies where physical loss of habitats is preventing the achievement of objectives
PL13 – Length (km) of water bodies where the exploitation/removal of animals/plants is preventing the achievement of objectives
PL14 – Length (km) of water bodies where unknown pressures are preventing the achievement of objectives
PN01 – Number of contaminated sites preventing the achievement of objectives
PN02 – Number of dams/ weirs/ barriers and locks associated with drinking water that have conditions not compatible with the achievement of objectives
PN03 – Number of dams/ weirs/ barriers and locks associated with flood protection that have conditions not compatible with the achievement of objectives
PN04 – Number of dams/ weirs/ barriers and locks associated with hydropower that have conditions not compatible with the achievement of objectives
PN05 – Number of dams/ weirs/ barriers and locks associated with industry that have conditions not compatible with the achievement of objectives
PN06 – Number of dams/ weirs/ barriers and locks associated with irrigation that have conditions not compatible with the achievement of objectives
PN07 – Number of dams/ weirs/ barriers and locks associated with navigation that have conditions not compatible with the achievement of objectives

PN08 – Number of dams/ weirs/ barriers and locks associated with other uses that have conditions not compatible with the achievement of objectives
PN09 – Number of dams/ weirs/ barriers and locks associated with recreation that have conditions not compatible with the achievement of objectives
PN10 – Number of discharges not connected to sewerage network that are preventing the achievement of objectives
PN11 – Number of farms not covered by advisory services
PN12 – Number of introduced diseases preventing the achievement of objectives
PN13 – Number of introduced species preventing the achievement of objectives
PN14 – Number of mine water discharges preventing the achievement of objectives
PN15 – Number of permits not compatible with the achievement of objectives
PN16 – Number of point sources preventing the achievement of objectives
PN17 – Number of urban areas with excessive overflows that are causing or contributing to failure of objectives
PN18 – Number of waste disposal sites preventing the achievement of objectives
PN19 – Number of water bodies affected by emissions/ discharges or losses of priority and priority hazardous substances
PN20 – Number of water bodies failing EQS for pesticides originating from diffuse agricultural sources
PN21 – Number of water bodies failing EQS
PO99 – Other indicator
PV01 – Volume (million m^3 per year) of storm water that is causing or contributing to failure of objectives
PV02 – Volume (million m^3 per year) of water abstracted/diverted for agriculture to be reduced to achieve objectives
PV03 – Volume (million m^3 per year) of water abstracted/diverted for aquaculture to be reduced to achieve objectives
PV04 – Volume (million m^3 per year) of water abstracted/diverted for cooling water to be reduced to achieve objectives
PV05 – Volume (million m^3 per year) of water abstracted/diverted for industry to be reduced to achieve objectives
PV06 – Volume (million m^3 per year) of water abstracted/diverted for other purposes (such as recreation) to be reduced to achieve objectives
PV07 – Volume (million m^3 per year) of water abstracted/diverted for public water supply to be reduced to achieve objectives

Annex 8q: List of Relevant KTM (KTM_Enum)

KTM elmement
KTM1 – Construction or upgrades of wastewater treatment plants
KTM10 – Water pricing policy measures for the implementation of the recovery of cost of water services from industry
KTM11 – Water pricing policy measures for the implementation of the recovery of cost of water services from agriculture
KTM12 – Advisory services for agriculture
KTM13 – Drinking water protection measures (e.g. establishment of safeguard zones, buffer zones etc)
KTM14 – Research, improvement of knowledge base reducing uncertainty
KTM15 – Measures for the phasing-out of emissions, discharges and losses of Priority Hazardous Substances or for the reduction of emissions, discharges and losses of Priority Substances
KTM16 – Upgrades or improvements of industrial wastewater treatment plants (including farms).
KTM17 – Measures to reduce sediment from soil erosion and surface run-off
KTM18 – Measures to prevent or control the adverse impacts of invasive alien species and introduced diseases
KTM19 – Measures to prevent or control the adverse impacts of recreation including angling
KTM2 – Reduce nutrient pollution from agriculture
KTM3 – Reduce pesticides pollution from agriculture.
KTM4 – Remediation of contaminated sites (historical pollution including sediments, groundwater, soil)
KTM5 – Improving longitudinal continuity (e.g. establishing fish passes, demolishing old dams)
KTM6 – Improving hydromorphological conditions of water bodies other than longitudinal continuity
KTM7 – Improvements in flow regime and/or establishment of ecological flows
KTM8 – Water efficiency, technical measures for irrigation, industry, energy and households
KTM9 – Water pricing policy measures for the implementation of the recovery of cost of water services from households
KTM20 – Measures to prevent or control the adverse impacts of fishing and other exploitation/removal of animal and plants
KTM21 – Measures to prevent or control the input of pollution from urban areas, transport and built infrastructure
KTM22 – Measures to prevent or control the input of pollution from forestry
KTM23 – Natural water retention measures
KTM24 – Adaptation to climate change
KTM25 – Measures to counteract acidification
KTM99 – Other key type measure reported under PoM

Annex 8r: List of Indicators for KTM (IndicatorKTM_Enum)

KTM indicator
KA01 – Area (km^2) of agricultural land required to be covered by advisory services to achieve objectives
KA02 – Area (km^2) of agricultural land required to be covered by measures to achieve objectives
KA03 – Area (km^2) of agricultural land required to be covered by measures to reduce pesticide pollution in agriculture to achieve objectives
KA04 – Area (km^2) of agricultural land where water pricing policy measures are required to achieve the objectives of Article 9
KA05 – Area (km^2) of bank/shore that require rehabilitation and/or restoration measures to achieve objectives
KA06 – Area (km^2) of bank/shore that require removal of hard infrastructure to achieve objectives
KA07 – Area (km^2) of buffer zones required to achieve objectives
KA08 – Area (km^2) of buffer zones required to counteract acidification to achieve objectives
KA09 – Area (km^2) of forest land required to be covered by measures to achieve objectives
KA10 – Area (km^2) of forest land requiring measures to reduce nutrient inputs to levels compatible with the achievement of objectives
KA11 – Area (km^2) of irrigated land required to be covered by measures to achieve objectives
KA12 – Area (km^2) of land for which water pricing policy measures are required to achieve the objectives of Article 9
KA13 – Area (km^2) of land required to be covered by drinking water protection zones to achieve objectives
KA14 – Area (km^2) of land required to be covered by measures to achieve objectives
KA15 – Area (km2) of land requiring regulation and/or codes of practice for use and disposal of chemicals in urbanised areas, transport and infrastructure to achieve objectives
KA16 – Area (km^2) of water bodies required to be covered by measures to achieve objectives
KA17 – Area (km^2) of water bodies required to be restored or reconnected to floodplains to achieve objectives
KA18 – Area (km^2) of water bodies requiring buffer zones to intercept or reduce sediment loads to water bodies to achieve objectives
KL01 – Length (km) of bank/shore that require rehabilitation and/or restoration measures to achieve objectives
KL02 – Length (km) of bank/shore that require removal of hard infrastructure to achieve objectives
KL03 – Length (km) of remeandering of straightened river channels required to achieve objectives
KL04 – Length (km) of river network requiring measures to achieve objectives
KL05 – Length (km) of river requiring bed restoration measures to achieve objectives
KL06 – Length (km) of river requiring buffer zones to achieve objectives
KL07 – Length (km) of river requiring buffer zones to counteract acidification to achieve objectives
KL08 – Length (km) of river requiring buffer zones to intercept or reduce sediment loads to rivers to achieve objectives
KL09 – Length (km) of transport infrastructure required to be subject to regulation and/or codes of practice for use and disposal of chemicals to achieve objectives
KL10 – Length (km) of water bodies required to be restored or reconnected to floodplains to achieve objectives
KL11 – Length (km) of water bodies requiring litter removal to achieve objectives
KN01 – Number of advisory services required to achieve objectives
KN02 – Number of aquaculture sites/facilities for which measures are required to achieve objectives
KN03 – Number of barriers required to be tackled to achieve objectives
KN04 – Number of Combined Sewer Overflows required to be upgraded to achieve objectives
KN05 – Number of contaminated sites to be remediated or where preventative actions need to be taken to achieve objectives
KN06 – Number of discharges required to be connected to sewerage network to achieve objectives
KN07 – Number of drinking water protection zones required to achieve objectives
KN08 – Number of Farm Surveys required to achieve objectives
KN09 – Number of farms that need to be covered by advisory services to achieve objectives

KN10 – Number of fish/continuity passes required to be installed to achieve objectives
KN11 – Number of households required to be covered by measures to achieve objectives
KN12 – Number of Individual Species Action Plans required for species identified as presenting particular risk levels for the achievement of objectives
KN13 – Number of installations associated with priority substances requiring measures to achieve objectives
KN14 – Number of installations for which water pricing policy measures are required to achieve the objectives of Article 9
KN15 – Number of installations where upgrades or improvements are required to achieve objectives
KN16 – Number of mine discharges requiring measures to achieve objectives
KN17 – Number of new permits required or permits that need to be updated to achieve objectives
KN18 – Number of research studies etc that are required to achieve objectives
KN19 – Number of sites requiring measures to achieve objectives
KN20 – Number of sources of litter that require control measures to achieve objectives
KN21 – Number of species for which codes of practice for reducing the spread of invasive alien species are required to be developed and implemented for the achievement of objectives
KN22 – Number of storm overflows required to be upgraded to achieve objectives
KN23 – Number of storm overflows where sediment flow to surface water is required to be intercepted or reduced to achieve objectives
KN24 – Number of substances requiring restrictions or bans on uses to achieve objectives
KN25 – Number of surface water interceptors and treatment facilities required to achieve objectives
KN26 – Number of sustainable drainage systems required to achieve objectives
KN27 – Number of waste disposal sites required to be upgraded or remediated to achieve objectives
KN28 – Number of wastewater treatment works requiring to be constructed or upgraded to achieve objectives
KN29 – Number of water bodies required to be affected by drinking water protection measures to achieve objectives
KN30 – Number of water bodies required to be covered by measures to achieve objectives
KN31 – Number of water bodies required to have eradication or control measures for the achievement of objectives
KN32 – Number of water bodies that are expected to achieve objectives as a result of research etc
KN33 – Number of water bodies that need to be limed to achieve objectives
KN34 – Number of water bodies where ecological flows need to be established to achieve objectives
KN35 – Number of water bodies where the operational modification of hydro-peaking is required to achieve objectives
KP01 – Reduction (%) in water consumption required to achieve objectives
KS01 – Population equivalent required to be treated by construction or upgrade of wastewater treatment plants to achieve objectives
KS02 – Population size for which water pricing policy measures are required to achieve the objectives of Article 9
KO99 – Other indicator

Annex 9: Reference Structure

All the references to RBMP sections or background documents will be reported according to the schema structure presented below (named ReferenceType in the model and schemas).

Copies of RBMPs are expected to be uploaded to WISE (to the CDR). As regards background documents, Member States will have two options (see section 1.7):

1. Upload a copy of the document to WISE; or

2. Provide a hyperlink to the document stored on the Member State's server. Where this option is selected, the Member State **must** guarantee that the hyperlink will remain stable and active for a period of 6 years after reporting, and that the document referred to will not be revised or updated.

In any case Member States are expected to report the **precise section or page range** where the relevant information is to be found in the RBMPs or background documents. The following schema structure allows reporting of the reference to specific sections/page ranges of the RBMPs or background documents, for either of the options above. The elements ' Subject', 'DocumentName' and 'Bookmark' are expected to be reported in all cases. The elements 'FileName' and 'Hyperlink' are alternative, depending on the option chosen. If the file has been uploaded in the CDR (option 1 above) the element 'FileName' will allow a precise identification of the document. If option 2 is chosen the element 'Hyperlink' will allow providing the URL of the document. In all cases more than one reference can be provided.

Schema element: subject **Field type / facets:** String250Type **Properties**: maxOccur = 1 minOccur = 1 **Guidance on completion of schema element**: Required. Describe in a few words the subject matter of the reference provided (e.g. methodology for assessment of ecological potential, methodology for the assessment of upward trends in groundwater, information on basic measures, etc).
Schema element: documentName **Field type / facets:** String250Type **Properties**: maxOccur = 1 minOccur = 1 **Guidance on completion of schema element**: Required. Provide the name of the reference document where other relevant information can be found. The name should identify the document unequivocally. For each document, either upload the document as a file or provide a hyperlink (see elements below)
Schema element: bookmark **Field type / facets:** String50Type **Properties**: maxOccur = 1 minOccur = 1 **Guidance on completion of schema element:** Required. For each document provide the chapter/s, sections/s or page range/s where the relevant information can be found.

Schema element: fileName **Field type / facets:** String50Type **Properties**: maxOccur = 1 minOccur = 0 **Guidance on completion of schema element:** Conditional. If the file containing the reference is uploaded to WISE, provide the file name of the uploaded document. Guidance on the naming of files and documents to be uploaded to WISE is included in the user manual for reporting to WISE (see Annex 6). **Quality checks:** Conditional check: Must be reported if element "Hyperlink" is not reported. Must not be reported if "Hyperlink" is reported. Only one value can be reported for each DocumentName. Cross Schema Check: Check FileName is consistent with the names of the files that have been uploaded in the CDR.
Schema element: hyperlink **Field type / facets:** String250Type **Properties**: maxOccur = 1 minOccur = 0 **Guidance on completion of schema element:** Conditional. If the document has not been uploaded to WISE, provide a hyperlink to the relevant background document. The Member State must guarantee that the hyperlink will remain stable and active for a period of 6 years after reporting, and that the information referred to will not be revised or updated. **Quality checks:** Conditional check: Must be reported if element "FileName" is not reported. Must not be reported if "FileName" is reported. Only one value can be reported for each DocumentName

Annex 10: UML Diagrams

Diagram 10.1: RBDSUCA schema
http://cdr.eionet.europa.eu/help/WFD/WFD_521_2016/UML/RBDSUCA_2016.png

Diagram 10.2: SWB schema
http://cdr.eionet.europa.eu/help/WFD/WFD_521_2016/UML/SWB_2016.png

Diagram 10.3: GWB schema
http://cdr.eionet.europa.eu/help/WFD/WFD_521_2016/UML/GWB_2016.png

Diagram 10.4: Monitoring schema
http://cdr.eionet.europa.eu/help/WFD/WFD_521_2016/UML/SWMonitoring_2016.png

Diagram 10.5: SWMET schema
http://cdr.eionet.europa.eu/help/WFD/WFD_521_2016/UML/SWMET_2016.png

Diagram 10.6: GWMET schema
http://cdr.eionet.europa.eu/help/WFD/WFD_521_2016/UML/GWMET_2016.png

Diagram 10.7: RBMPPoM schema
http://cdr.eionet.europa.eu/help/WFD/WFD_521_2016/UML/RBMPPoM_2016.png

WISE GIS Guidance

Guidance on the reporting of spatial data to WISE

Version 6.0.6
2016-04-29

WISE
WATER INFORMATION
SYSTEM FOR EUROPE

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Quick Start

1. The following WISE reference spatial data sets are required:
   - River basin districts
   - River basin district sub-units
   - Surface water bodies
   - Groundwater bodies
   - Monitoring sites
   - Protected areas
2. The geometry of surface water bodies must be reported using polygons or polylines (as appropriate for a given water body). If applicable, separate files must be provided for each geometry type.
3. The geometry of protected areas must be reported as polygons, polylines or points (as appropriate for a given protected area). If applicable, separate files must be provided for each geometry type.
4. Two additional data sets allow the reporting of:
   - The centrelines of surface water bodies, forming a hydrographic network;
   - The delineation of horizons, for groundwater bodies that have different horizons.
5. The quality of the data sets must be evaluated by the Data Providers before the submission. Attention must be paid to the spatial alignment across national and international borders for the purpose of producing a harmonised European level dataset. Reference data sets are available to support this alignment.
6. The coordinate reference system for spatial data must be ETRS89-GRS80 or ETRS89-LAEA.
   For areas outside the scope of ETRS89, WGS 84 must be used.
7. Metadata must be provided for each spatial data file, according to the INSPIRE metadata profile.
8. The spatial data files must be submitted as valid GML files, conformant with the schemas available in the Data Dictionary schemas (http://dd.eionet.europa.eu/schemasets/browse/).
9. The spatial data files may be prepared as *shapefiles*. The *shapefile* templates available in the resources page (http://cdr.eionet.europa.eu/help/) must be used. The *shapefiles* must be converted to GML using the conversion tools available in the same page. The GML files must then be uploaded to the appropriate envelope in Reportnet CDR.
10. The spatial data files must follow the naming convention defined in this document.
11. Spatial data must be submitted as complete national datasets (i.e. in a single national data set and not separated per river basin district).
12. For the 2016 Water Framework Directive reporting, submissions to Reportnet must be completed no later than 22nd March 2016.

WISE Reporting obligations

WFD reporting

For Data Providers reporting under the Water Framework Directive, this document is Annex 5 to the WFD Reporting Guidance 2016. It provides a short guidance in the preparation and reporting of spatial data. The following Annexes of the WFD Reporting Guidance are also relevant to the reporting of spatial data:

- Annex 4: Groundwater bodies and horizon assignment.
- Annex 6: Reporting on the River Basin Management Plans – a user manual.

The GML schemas, *shapefile* templates and supporting documents required for the WFD reporting are available in Reportnet via http://cdr.eionet.europa.eu/help/WFD.

If you need assistance on issues not addressed in this document please contact the WFD helpdesk at wfd.helpdesk@eionet.europa.eu.

In accordance with the WISE reporting arrangements, Member States may update the data submitted to WISE at any time. Member States should ensure that the latest, correct information is available in WISE since that will be used for compliance checking and publication.

The quality, accuracy and validation of the information and data in WISE is the responsibility of the Member States. Quality assurance and control processes will be carried out by the WISE partners. The Commission, the EEA or its contracted partners may contact the Member State in case there is an indication that any of the data may be erroneous or misleading. This may lead to a resubmission request to the Member State.

WISE SoE reporting

For Data Providers not reporting under the Water Framework Directive, but reporting under WISE SoE, the same guidelines defined for WFD Reporting are to be followed. If applicable, exceptions or particular cases are described under the different sections of the GIS guidance.

Only the information not reported via the WFD Reporting is required (e.g. EIONET monitoring sites that are not WFD monitoring sites). Information on Protected Areas is not required under WISE SoE.

Please refer to the information available in http://cdr.eionet.europa.eu/help/WISE_SoE/wise5.

If you need assistance on issues not addressed in this document please contact the WISE SoE helpdesk at wisesoe.helpdesk@eionet.europa.eu.

Data content

This section provides an overview of the content of the different WISE spatial data sets and of the constraints and requirements applicable to the spatial objects and their relationships. Examples are provided to clarify some specific situations.

River basin districts and sub-units

Definitions

Table 1. Definitions relevant for the RiverBasinDistrict and the SubUnit data sets.

Concept	Definition	Related data sets
River basin district	The area of land and sea, made up of one or more neighbouring river basins together with their associated groundwaters and coastal waters, which is the main unit for management of river basins.	RiverBasinDistrict, SubUnit
River basin	The area of land from which all surface run-off flows through a sequence of streams, rivers and, possibly, lakes into the sea at a single river mouth, estuary or delta.	RiverBasinDistrict, SubUnit
Sub-basin	The area of land from which all surface run-off flows through a series of streams, rivers and, possibly, lakes to a particular point in a water course (normally a lake or a river confluence).	SubUnit
Sub-unit	[Operational definition. Not in the WFD] Reporting unit. River basin districts larger than 50000 square kilometre should be divided into comparable sub-units with an area between 5000 and 50000 square kilometre. The sub-units should be created using river basins (if more than one river basin exists in the RBD), set of contiguous river basins, or sub-basins, for example. If the RBD area is less than 50000 square kilometre, the RBD itself should be used as a sub-unit.	SubUnit

Reporting river basin districts and sub-units

River basin districts are reported in the RiverBasinDistrict data set.
Sub-units are reported in the SubUnit data set.

Constraints and quality control

1. The RiverBasinDistrict data set must form a complete tessellation of the national territory to the limit of the coastal waters (i.e. 1 nautical mile for the territorial waters baseline).
2. Each sub-unit must be assigned to one and only river basin district.
3. Each sub-unit polygon must be contained by its river basin district polygon.
4. The SubUnit data set must form a complete tessellation with the same spatial coverage of the RiverBasinDistrict data set.

Note 1: In a tessellation, the polygons must fill the plane with no gaps, overlaps or self-intersecting boundaries.

Note 2: In the spatial data set, if a given river basin district has not been divided into sub-units, Data Providers are requested to report the geometry of the river basin district as a sub-unit. This facilitates the data processing and quality control of the delivered spatial data set.

Note 3: For more information on sub-units see the "Report on sub-units – version 5, 31 January 2008. Paper prepared for the meeting of the CIS Working Group Reporting."
https://circabc.europa.eu/w/browse/4b0e9c5d-f5b0-410e-a721-7ae90c8ef844

Special case: reporting river basins under WISE SoE

For Data Providers not reporting under the Water Framework Directive, a RiverBasinDistrict data set and a SubUnit data set is requested under WISE - Spatial Data (WISE-5).

These data sets will provide the necessary spatial reference for the data reported in the WISE SoE - Emissions (WISE-1) and the WISE SoE - Water Quantity (WISE-3) data flows, and will also allow European-wide comparisons to be made, using a similar structure to that available for EU Member States and Norway.

In this context, river basin districts should be interpreted as reporting units created from contiguous sets of river basins (and sub-units should be defined according to criteria similar to those proposed in the WFD). Figure 1 illustrates the reporting of the RiverBasinDistrict spatial reference data set required for WFD and WISE SoE: in practice, only the thematic identifier scheme changes. Please refer to the section on “Identifier management” for further information.

Figure 1. Reporting of river basins for two hypothetical countries: XZ reporting under WFD and WISE SoE; and ZZ reporting only under WISE SoE.

thematicID Identifier	thematicID IdentifierScheme
XZ1	euRBDCode
XZ2	euRBDCode
XZ3	euRBDCode
XZ4	euRBDCode

thematicID Identifier	thematicID IdentifierScheme
ZZ1	eionetRBDCode
ZZ2	eionetRBDCode
ZZ3	eionetRBDCode
ZZ4	eionetRBDCode

Surface water bodies

Definitions

Table 2. Definitions relevant for the SurfaceWaterBody, SurfaceWaterBodyLine and SurfaceWaterBodyCentreline data sets.

Concept	Definition	Related data sets
Surface water body	Body of surface water means a discrete and significant element of surface water such as a lake, a reservoir, a stream, river or canal, part of a stream, river or canal, a transitional water or a stretch of coastal water.	SurfaceWaterBody, SurfaceWaterBodyLine, SurfaceWaterBodyCentreline
Surface water	Inland waters, except groundwater; transitional waters and coastal waters, except in respect of chemical status for which it shall also include territorial waters.	SurfaceWaterBody, SurfaceWaterBodyLine, SurfaceWaterBodyCentreline
Inland water	All standing or flowing water on the surface of the land, and all groundwater on the landward side of the baseline from which the breadth of territorial waters is measured.	SurfaceWaterBody, SurfaceWaterBodyLine, SurfaceWaterBodyCentreline, GroundWaterBody, GroundWaterBodyHorizon
Territorial sea	The territorial waters, or territorial sea as defined by the 1982 United Nations Convention on the Law of the Sea, extend up to a limit not exceeding 12 nautical miles (22.2 km), measured from the baseline. The normal baseline is the low-water line along the coast.	
Territorial waters	[Operational definition. Not in WFD.] *Reporting unit*. The zone between the limit of the coastal water bodies and the limit of the territorial sea, can be geometrically subdivided in polygons according to proximity to the adjacent coastal sub-unit (i.e. creating a Voronoi partition) or using any alternative delineation provided by the national competent authorities. Each reporting unit must be assigned to an adjacent sub-unit for the purpose of reporting the chemical status of the territorial waters under the Water Framework Directive.	SurfaceWaterBody
Coastal water	Surface water on the landward side of a line, every point of which is at a distance of one nautical mile on the seaward side from the nearest point of the baseline from which the breadth of territorial waters is measured, extending where appropriate up to the outer limit of transitional waters.	SurfaceWaterBody
Transitional waters	Bodies of surface water in the vicinity of river mouths which are partly saline in character as a result of their proximity to coastal waters but which are substantially influenced by freshwater flows.	SurfaceWaterBody, SurfaceWaterBodyLine, SurfaceWaterBodyCentreline
River	Body of inland water flowing for the most part on the surface of the land but which may flow underground for part of its course.	SurfaceWaterBody, SurfaceWaterBodyLine, SurfaceWaterBodyCentreline
Lake	Body of standing inland surface water.	SurfaceWaterBody, SurfaceWaterBodyLine, SurfaceWaterBodyCentreline
Artificial water body	Body of surface water created by human activity.	SurfaceWaterBody, SurfaceWaterBodyLine, SurfaceWaterBodyCentreline
Heavily modified water body	Body of surface water which as a result of physical alterations by human activity is substantially changed in character, as designated by the Member State in accordance with the provisions of Annex II of the Water Framework Directive.	SurfaceWaterBody, SurfaceWaterBodyLine, SurfaceWaterBodyCentreline

Reporting surface water bodies

The diagram in Figure 2 will be used in the examples.

Figure 2. Surface water bodies represented by different geometries.

Reporting surface water bodies using the SurfaceWaterBody data set

If the reference geometry of the surface water body is a polygon, then the surface water body must be reported in the SurfaceWaterBody data set.
Note that the reference geometry for rivers may also be a polygon. For example, the WFD reporting guidance recommends that reservoirs formed by damming rivers (i.e. heavily modified rivers) should be reported as river water bodies.

Figure 3. Polygon geometries to be included in the SurfaceWaterBody data set.

Figure 4. Geometry and thematic identifier in the SurfaceWaterBody data set (see also Figure 3).

geometry	thematicID Identifier	thematicID IdentifierScheme
	XZRLW22	euSurfaceWaterBodyCode
	XZTW22	euSurfaceWaterBodyCode
	XYCW11	euSurfaceWaterBodyCode
	XYTEW11	euSurfaceWaterBodyCode

Reporting surface water bodies using the SurfaceWaterBodyLine data set

If the reference geometry of the surface water body is linear, then the surface water body must be reported in the SurfaceWaterBodyLine data set.

Figure 5. Polyline geometries to be included in the SurfaceWaterBodyLine data set.

Figure 6. Geometry and thematic identifier in the SurfaceWaterBodyLine data set (see also Figure 5).

geometry	thematicID Identifier	thematicID IdentifierScheme
	XZRW111	euSurfaceWaterBodyCode
	XZRW222	euSurfaceWaterBodyCode
	XZRW333	euSurfaceWaterBodyCode
	XZRW444	euSurfaceWaterBodyCode
	XZRW555	euSurfaceWaterBodyCode
	XZRW555	euSurfaceWaterBodyCode

Constraints and quality control

1. Each surface water body must be assigned to one and only sub-unit.
2. Surface water bodies must not overlap each other. This requirement applies regardless of the reference geometry: polygons must not overlap each over, line segments must not overlap each other (a node must exist at intersections) and finally lines and polygons cannot overlap each other. Adjacent water bodies must touch each other at vertices or nodes along a common boundary.
3. Each surface water body, with the exception of territorial waters, must overlap or be contained by its sub-unit polygon.
4. Each surface water body, with the exception of coastal and territorial waters, must be contained by the river basin district polygon.
5. If the coastal water body is contained by the sub-unit, the common boundary between coastal waters and adjacent territorial waters must coincide with the seaward limit of the sub-unit.

Special case: reporting coastal waters

Coastal waters are represented by polygons and must be reported in the SurfaceWaterBody data set.

Coastal waters must be assigned to a sub-unit. This may involve the splitting of stretches of coastal water that might otherwise be considered as single water bodies. When assigning a stretch of coastal water to a River Basin District, the objective is to ensure that coastal waters are assigned to the closest possible or the most appropriate natural management unit and to minimise any unnecessary splitting of coastal stretches. To ensure consistency in the approach, the following principles should be applied:

- Where possible, existing boundaries should be used. Examples are ecoregions defined in the WFD and regions defined in the Marine Conventions;
- The boundaries between two adjacent types should be used wherever possible to minimise unnecessary splitting of the coastline;
- In the general case, the coastline should be split at open coast areas rather than through natural management units such as bays or inlets. However, specific situations may exist where the splitting of natural units for management purposes cannot be avoided.

Special case: reporting units for territorial waters

Territorial waters are treated as surface water bodies for reporting purposes only. Territorial waters are represented by polygons and must be reported in the SurfaceWaterBody data set.

The delineation of reporting units in the territorial waters zone, and their assignment to an adjacent sub-unit for reporting purposes, can be done by the competent national authorities according to the criteria best fitting the specific conditions of their territorial sea.

Figure 7 illustrates a simple geometric procedure whereby the territorial waters are subdivided in polygons according to their proximity to the adjacent coastal sub-unit (i.e. creating a Voronoi partition). Each reporting unit is then assigned to the adjacent sub-unit with which it shares the longest border. Note the omission of a reporting unit adjacent to the small XZSU22 sub-unit. This omission illustrates the possibility of merging neighbouring units (preferably only if the sub-units belong to the same RBD): the resulting XZTEW21 unit should be assigned to sub-unit XZSU21 (unless local conditions advice otherwise).

Figure 7. Illustrative delineation of territorial waters for reporting purposes.

Figure 8. Reporting territorial waters and adjacent sub-units in the SurfaceWaterBody data set (see also Figure 7).

thematicID Identifier	thematicID IdentifierScheme	relatedZone Identifier	relatedZone IdentifierScheme
XZTEW11	euSurfaceWaterBodyCode	XZSU11	euSubUnitCode
XZTEW12	euSurfaceWaterBodyCode	XZSU12	euSubUnitCode
XZTEW21	euSurfaceWaterBodyCode	XZSU21	euSubUnitCode

Special case: reporting surface water bodies under WISE SoE

Example 1: Under the Water Framework Directive, countries may have defined a minimum catchment area in km² for a river to be delineated as a water body in the RBMP, or a minimum surface area in km² for a lake to be delineated as a water body in the RBMP. This means that water bodies below the minimum threshold are not delineated as WFD surface water bodies, and are not reported under the WFD data flow.
If (and only if) some of these smaller water bodies are being monitored and time series information is being reported under the WISE SoE - Water Quality (WISE-4) or the WISE SoE - Water Quantity (WISE-3) data flows, then the Data Providers are requested to report their geometry. The term EIONET water body refers to this specific case.

Example 2: Under the Water Framework Directive, countries may have delineated a given surface water body such that it includes different reservoirs for which inflow, outflow or stock volume is reported under the WISE SoE - Water Quantity (WISE-3) data flow. In this situation, each reservoir should be given an EIONET identifier and reported under WISE-5.

Similarly, countries not reporting under WFD are requested to provide the delineation of EIONET water bodies, to provide the necessary spatial reference for the data reported in the WISE SoE - Water Quality (WISE-4) or WISE SoE - Water Quantity (WISE-3) data flows. Data Providers are also encouraged to report the geometry of the national water bodies (even if not monitored by EIONET monitoring sites) to allow an overview of the completeness of the spatial coverage of the EIONET data at national and European level.

Figure 9 illustrates the reporting of water bodies data under WFD and under WISE SoE: in practice, only the thematic identifier scheme changes. Please refer to the section on "Identifier management" for further information.

Figure 9. Reporting of surface water bodies for two hypothetical countries: XZ reporting under WFD and WISE SoE; and ZZ reporting only under WISE SoE.

thematicID Identifier	thematicID IdentifierScheme
XZA	euSurfaceWaterBodyCode
XZB	euSurfaceWaterBodyCode
XZC	eionetSurfaceWaterBodyCode
XZD	eionetSurfaceWaterBodyCode

thematicID Identifier	thematicID IdentifierScheme
ZZA	eionetSurfaceWaterBodyCode
ZZB	eionetSurfaceWaterBodyCode
ZZC	eionetSurfaceWaterBodyCode
ZZD	eionetSurfaceWaterBodyCode

Reporting surface water body centrelines

In the scope of the WFD reporting, a representation of the centrelines of surface water bodies is requested. This hydrographic network must be reported in the SurfaceWaterBodyCentreline data set.

The centreline of each surface water bodies must be split into segments, such that each segment belongs to one and only one hydrographic feature.
The hydrographic code and the geographical name of the hydrographic feature must be reported.

Figure 10. Representation of the hydrographic network.

Each segment must be classified according to its type, using the **continua** element value:

- realSurfaceWaterSegment
- realUndergroundSegment
- virtualSegmentLake
- virtualSegmentToConnectTributary
- virtualSegmentTransitionalWater
- virtualSegmentCoastalWater
- virtualSegmentTerritorialWater
- virtualSegmentNotUnderOtherClassification

In the example in Figure 10, let it be assumed that:

- "River M" is the main river, flowing from node 7 to node 0;
- "River S" is a tributary of river M, flowing from node 10 to node 2;
- "River T" is a tributary of river M, flowing from node 12 to node 5;
- "River G" is a tributary of river M, flowing from node 15 to node 6;
- "River F" is a tributary of river S, flowing from node 13 to node 8;
- "River H" is a tributary of river T, flowing from node 14 to node 11.

Let it also be assumed that the hydrographic identifier of each centreline segment is simply the number of its initial node.

Table 3 presents the hydrographic network as it would be described in the SurfaceWaterBodyCentreline data set.

Table 3. Representation of the hydrographic network in the SurfaceWaterBodyCentreline data set (see also Figure 10).

thematicIdIdentifier	thematicIdIdentifierScheme	hydroIdLocalId	geographicalNameText	continua
XZTW22	euSurfaceWaterBodyCode	1	River M	virtualSegmentTransitionalWater
XZRW555	euSurfaceWaterBodyCode	2	River M	realSurfaceWaterSegment
XZRW333	euSurfaceWaterBodyCode	3	River M	realSurfaceWaterSegment
XZLW22	euSurfaceWaterBodyCode	4	River M	virtualSegmentLake
XZRW111	euSurfaceWaterBodyCode	5	River M	realSurfaceWaterSegment
XZRW111	euSurfaceWaterBodyCode	6	River M	realSurfaceWaterSegment
XZRW111	euSurfaceWaterBodyCode	7	River M	realSurfaceWaterSegment
XZRW444	euSurfaceWaterBodyCode	8	River S	realSurfaceWaterSegment
XZRW444	euSurfaceWaterBodyCode	9	River S	realSurfaceWaterSegment
XZRW666	euSurfaceWaterBodyCode	10	River S	realSurfaceWaterSegment
XZRW222	euSurfaceWaterBodyCode	11	River T	realSurfaceWaterSegment
XZRW222	euSurfaceWaterBodyCode	12	River T	realSurfaceWaterSegment
XZRW444	euSurfaceWaterBodyCode	13	River F	realSurfaceWaterSegment
XZRW122	euSurfaceWaterBodyCode	14	River H	realSurfaceWaterSegment
XZRW111	euSurfaceWaterBodyCode	15	River G	realSurfaceWaterSegment

Figure 11 illustrates the case where a virtual segment is required to reestablish the connectivity of the network. In the example, the lake water body XZLW1 is a reservoir represented by a polygon geometry and reported in the SurfaceWaterBody dataset. The river water bodies XZRW1 and XZRW2 are represented by polyline geometries and reported in the SurfaceWaterBodyLine dataset.

Figure 11. Surface water body centreline example: virtual segment not under classification.

Depending on the scale and the level of detail of the information, there may be a discontinuity between the geometry of the reservoir and the geometry of the downstream river, e.g. due to the presence of a dam.
In this case, the small virtual segment between node 1 and node 2 can be used to reestablish the connectivity, although that segment is not contained by either or the water bodies.
Table 4 presents the relevant attributes for the centrelines. Note the absence of the water body identifier and identifier scheme when the segment is classified as 'virtualSegmentNotUnderOtherClassification'. Note also that these two elements must be present when the continua takes any other value.

Table 4. Representation of the hydrographic network in the SurfaceWaterBodyCentreline data set (see also Figure 11).

thematicIdIdentifier	thematicIdIdentifierScheme	hydroIdLocalId	continua
XZRW1	euSurfaceWaterBodyCode	1	realSurfaceWaterSegment
		2	virtualSegmentNotUnderOtherClassification
XZLW1	euSurfaceWaterBodyCode	3	virtualSegmentLake
XZRW2	euSurfaceWaterBodyCode	4	realSurfaceWaterSegment

If the segment is a real hydrographic feature connecting WFD surface water bodies, but that does not belong to any WFD surface water body, do not report the thematicIdIdentifier and provide the value 'realSurfaceWaterSegment' (or 'realUndergroundSegment', if applicable) in the continua element.

Figure 12 illustrates a different situation. The river water body XZRW2 is represented by a polygon geometry and is reported in the SurfaceWaterBody dataset. The river water bodies XZRW1, XZRW3 and XZRW4 are represented by polyline geometries and are reported in the SurfaceWaterBodyLine dataset.

Figure 12. Surface water body centreline example: virtual segment to connect tributary.

When reporting the centrelines, a connection must be established between the different rivers, using virtual segments within the river water body XZRW2. Table 5 presents the relevant attributes for the centrelines.

Table 5. Representation of the hydrographic network in the SurfaceWaterBodyCentreline data set (see also Figure 12).

thematicIdIdentifier	thematicIdIdentifierScheme	hydroIdLocalId	continua
XZRW1	euSurfaceWaterBodyCode	1	realSurfaceWaterSegment
XZRW2	euSurfaceWaterBodyCode	2	virtualSegmentToConnectTributary
XZRW2	euSurfaceWaterBodyCode	3	virtualSegmentToConnectTributary
XZRW2	euSurfaceWaterBodyCode	4	virtualSegmentToConnectTributary
XZRW3	euSurfaceWaterBodyCode	5	realSurfaceWaterSegment
XZRW4	euSurfaceWaterBodyCode	6	realSurfaceWaterSegment

Constraints and quality control

In the SurfaceWaterBodyLine data set, each geometry may be composed of multiple parts.
In the SurfaceWaterBodyCentreline data set, the geometry of each segment must represented by one line string (i.e. a sequence of line segments). Each geometry must have only one part.

From a geometric and topological point of view, the data quality requirements described in section 10.2 "Data capture for Network" of the INSPIRE Data Specification on Hydrography v3.1 are directly applicable to the SurfaceWaterBodyCentreline data set (with the exception of sections 10.2.8 and 10.2.9).
Please refer to the INSPIRE Data Specification on Hydrography v3.1 for a complete description (http://inspire.ec.europa.eu/documents/Data_Specifications/INSPIRE_DataSpecification_HY_v3.1.pdf).

Groundwater bodies

Definitions

Table 6. Definitions relevant for the GroundWaterBody and GroundWaterBodyHorizon data set.

Concept	Definition	Related data sets
Groundwater body	'Body of groundwater' means a distinct volume of groundwater within an aquifer or aquifers.	GroundWaterBody, GroundWaterBodyHorizon
Groundwater	All water which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil.	GroundWaterBody, GroundWaterBodyHorizon
Aquifer	Subsurface layer or layers of rock or other geological strata of sufficient porosity and permeability to allow either a significant flow of groundwater or the abstraction of significant quantities of groundwater.	GroundWaterBody, GroundWaterBodyHorizon

Reporting groundwater bodies using the GroundWaterBody data set

Groundwater bodies are represented by 2D polygon geometries (where the outer boundary is the horizontal projection of the extent of the groundwater body). Groundwater bodies are reported in the GroundWaterBody data set.
The geometry of a body of groundwater may overlap the geometry of more than one RBD in the national territory. However, one groundwater body must be assigned to one and only one river basin district. If the different parts are managed separately (e.g. require different measures or have different competent authorities) then this cannot be treated as a single water body and needs to be split (not necessarily along the geographical borders of the RBD but rather according to the different identification of measures). Please note that reporting the same water body twice, with the same geometry and different measures, in two different RBDs, is not possible.

The **horizons** element identifies the different horizons in the groundwater body – the different horizons must be reported as a comma-separated list of integer values. For example:

- If the groundwater body belongs to horizon 1, simply report '1'.
- If the groundwater body belongs to horizon 2 and 3, report '2,3'.
  In this situation, the geometry of the part belonging to horizon 2 and the geometry of the part belong to horizon 3 must be reported in the GroundWaterBodyHorizon data set.

Please refer to Annex 4 in the WFD Reporting Guidance for further information on the delineation of groundwater bodies.

Constraints and quality control

1. Each groundwater body must be assigned to one and only River Basin District.
2. The groundwater body polygon must be contained by or overlap the River Basin District polygon.
3. The groundwater body polygon must be completely contained on the national territory.
4. Groundwater bodies may overlap each other (if at different depths).

Special case: reporting groundwater bodies under WISE SoE

Note that the GroundWaterBodyHorizon data set is not required under WISE SoE.
Only the GroundWaterBody data set is required, even if a given groundwater body has more than one horizon.

The principles described for surface water bodies are applicable to the reporting of groundwater bodies under WISE SoE. Please refer to the section "Special case: reporting surface water bodies under WISE SoE" (cf. page 10) for further information.

Reporting horizons using the GroundWaterBodyHorizon data set

If, and only if, a groundwater body has different horizons, then the GroundWaterBodyHorizon data set must be used to report the spatial delineation of each horizon. Please refer to Annex 4 in the WFD Reporting Guidance for further information on the spatial delineation of groundwater horizons.

The **horizon** element identifies each of the horizons of a groundwater body, using a simple integer numeration (in the sense of the numerical position of the groundwater body starting with the first horizon from the surface).

Data Providers not reporting under WFD are not required to provide this data set.

Constraints and quality control

1. The GroundWaterBodyHorizon data set must contain all the groundwater bodies that belong to two or more horizons.
2. In the GroundWaterBodyHorizon data set, at least two different parts must be reported for each groundwater body.
3. Each part of a given groundwater body must belong to a different horizon.
4. The geometry of each part of a given groundwater body may contain one or more spatially disjoint polygons.
5. The geometries of each part of a given groundwater body must not overlap.
6. The spatial union of the geometries of the each part of a given groundwater (in the GroundWaterBodyHorizon data set) must be equal to the geometry of the groundwater body (as reported in the GroundWaterBody data set).
7. For each part, the value in the **horizon** element (in the GroundWaterBodyHorizon data set) must match one of the values provided in the **horizons** element of the corresponding groundwater body (in the GroundWaterBody data set).

Monitoring sites

Definitions

Table 7. Definitions relevant to the MonitoringSite data set.

Concept	Definition	Related data sets
Monitoring site	[Operational definition. Not in the WFD] Data Providers reporting under WFD are requested to report monitoring sites established for the following monitoring purposes listed in Table 16 (cf. page 48). Data Providers reporting under WISE SoE are requested to report monitoring sites included in the EIONET WISE SoE network (if the monitoring site is not also a WFD monitoring site).	MonitoringSite

Reporting monitoring sites using the MonitoringSite data set

All monitoring sites are reported in the MonitoringSite data set: this includes both surface water monitoring sites and groundwater monitoring sites.
The location of a monitoring site is always reported as a (representative) point.

Constraints and quality control

1. Each monitoring site must be assigned to one and only water body.
2. If the water body is represented by a polygon (i.e. if it is represented in the SurfaceWaterBody or GroundWaterBody data set), then the monitoring site representative point must be contained within the water body polygon.
3. If the water body is represented by a polyline (i.e. if it is represented in the SurfaceWaterBodyLine data set), then the monitoring site representative point should be within a 200 metre distance of the water body geometry.

Special case: reporting monitoring sites under WISE SoE

For Data Providers reporting under the Water Framework Directive, the monitoring sites currently reported under WISE SoE - Water Quality (WISE-4) or WISE SoE - Water Quantity (WISE-3) will most probably also be included in one or more of the WFD monitoring programmes (and hence be reported under the WFD data flow). In exceptional cases, monitoring sites may exist that were only reported under WISE SoE (e.g. see the section “Special case: reporting surface water bodies under WISE SoE”).

Table 6 illustrates the reporting (under WFD only) of a WFD monitoring site that is also an EIONET site and that had a different code in the WISE-4 or WISE-3 reporting. The monitoring site is reported only once (under WFD). It is not necessary to report it again in WISE-5.

Table 8. Reporting of EIONET monitoring sites in the WFD reporting.

thematicIdIdentifier	thematicIdIdentifierScheme	relatedToIdentifier	relatedToIdentifierScheme
XZMS1	euMonitoringSiteCode	XZ5671-OLD-EIONET-CODE	eionetMonitoringSiteCode

Figure 13 illustrates the reporting of the monitoring site reference data required for WFD and WISE SoE: in practice, only the thematic identifier scheme changes.
Please refer to the section on “Identifier management” for further information.

Figure 13. Reporting of monitoring sites for two hypothetical countries: XZ reporting under WFD and WISE SoE; and ZZ reporting only under WISE SoE.

Country XZ

thematicID Identifier	thematicID IdentifierScheme	featureOfInterest Identifier	featureOfInterest IdentifierScheme
XZ1	euMonitoringSiteCode	XZA	euSurfaceWaterBodyCode
XZ2	euMonitoringSiteCode	XZA	euSurfaceWaterBodyCode
XZ3	euMonitoringSiteCode	XZB	euSurfaceWaterBodyCode
XZ4	euMonitoringSiteCode	XZB	euSurfaceWaterBodyCode
XZ5	eionetMonitoringSiteCode	XZC	eionetSurfaceWaterBodyCode
XZ6	eionetMonitoringSiteCode	XZD	eionetSurfaceWaterBodyCode
XZ9	eionetMonitoringSiteCode	XZB	euSurfaceWaterBodyCode

Country ZZ

thematicID Identifier	thematicID IdentifierScheme	featureOfInterest Identifier	featureOfInterest IdentifierScheme
ZZ1	eionetMonitoringSiteCode	ZZA	eionetSurfaceWaterBodyCode
ZZ2	eionetMonitoringSiteCode	ZZA	eionetSurfaceWaterBodyCode
ZZ3	eionetMonitoringSiteCode	ZZB	eionetSurfaceWaterBodyCode
ZZ4	eionetMonitoringSiteCode	ZZB	eionetSurfaceWaterBodyCode
ZZ5	eionetMonitoringSiteCode	ZZC	eionetSurfaceWaterBodyCode
ZZ6	eionetMonitoringSiteCode	ZZD	eionetSurfaceWaterBodyCode
ZZ9	eionetMonitoringSiteCode	ZZB	eionetSurfaceWaterBodyCode

Protected areas

Protected areas must be represented by polygon, polyline or point geometries: use the ProtectedArea data set, the ProtectedAreaLine data set or the ProtectedAreaPoint data set accordingly.

Each type of protected area is identified using the **zoneType** value. The values 'nitrateVulnerableZone', 'sensitiveArea', 'bathingWaters' and 'drinkingWaterProtectionArea' identify areas designated under the Nitrates Directive, Urban Waste Water Treatment Directive, Bathing Waters Directive or Drinking Water Directive, respectively.

For other protected areas, the **zoneType** element is 'designatedWaters' and the **specialisedZoneType** element is used to further distinguish different types: 'shellfishDesignatedWater', 'freshwaterFishDesignatedWater' or 'otherProtectedArea'.

Note that areas protected under the Habitats or Birds directive are not reported in the WISE spatial data sets. Please refer to the "Clarification on the reporting of spatial data for protected areas" document in the CDR help pages.

Data Providers reporting under WISE-5 do not report the Protected Areas data sets.

Data quality

Data providers are recommended not to simplify or generalise the spatial data reported to WISE.
The accuracy of the data should be documented in the metadata so that any further processing done in the production of the European reference data sets can respect the accuracy of the original data source.

Considering both WISE needs and the practical constraints of data availability, it is recommended that to report data with positional accuracy acceptable for cartographic representation at the 1:100000 scale or larger. The positional accuracy should always be kept as high as possible and ideally be similar to the national operational data sets.

Geodetic coordinates must be expressed in decimal degree, with a minimum recommended precision of 5 decimal places. Projected coordinates must be expressed in metre, with a minimum recommended precision of 1 decimal places. See the section on “Coordinate reference systems” for further information.

The quality of the data sets must be evaluated by the Data Providers before the submission.

For each dataset, the sections on "Constraints and quality control" express a number of requirements on the topology and/or spatial relationships between different types of spatial units. However, and to keep the model as simple as possible, topology is handled implicitly rather than explicitly. There is therefore a prerequisite for "implicit topology", i.e. the data provided should be sufficiently clean to support automated topological construction based on the reported geometry.

Reporting of fully consistent geometries across different datasets can be difficult due to inherent limitations in the original data sources or to discrepancies between the different data sources. For this reason, a spatial tolerance factor was introduced in some of the quality control checks.
For the tests listed in Table 9, if the test fails but the issue detected is within the spatial tolerance value, then the quality control raises an 'WARNING' but not a 'BLOCKER' (i.e. the data delivery can be released).
Data Providers are advised to check the WARNING and correct errors or systematic misalignments.

Attention must be paid to the spatial alignment across national and international borders for the purpose of producing a harmonised European level data set. Reference data sets are made available to support this alignment. Country boundaries are available at the WISE restricted access area. Note that access is restricted to authorised Water Framework Directive Data Reporters and subject to use conditions (Figure 14).

The EEA coastline for analysis is available at http://www.eea.europa.eu/data-and-maps/data/eea-coastline-for-analysis-1 and may be used, subject to the constraints expressed in its metadata (http://www.eea.europa.eu/data-and-maps/data/eea-coastline-for-analysis-1#tab-metadata).

Table 9. Spatial quality control tests where a spatial tolerance value is applied

Test	Source dataset	Target dataset	Message	Spatial tolerance
SS03	SubUnit	RiverBasinDistrict	The geometry of the subunit must be within the geometry of the associated river basin district.	If all the parts of the source geometry that are not within the target geometry have an area of less than 625 square metre, then only a 'WARNING' is raised.
SS04B	SurfaceWaterBody	RiverBasinDistrict	The geometry of the surface water body (except for territorial waters) must be within the geometry of the associated river basin district.	If all the parts of the source geometry that are not within the target geometry have an area of less than 625 square metre, then only a 'WARNING' is raised.
SS05B	SurfaceWaterBodyLine	RiverBasinDistrict	The geometry of the surface water body must be covered by the geometry of the associated river basin district.	If all the parts of the source geometry that are not covered by the target geometry have a length of less than 25 square metre, then only a 'WARNING' is raised.
SS08B	MonitoringSite	RiverBasinDistrict	The geometry of the monitoring site must not be disjoint of the geometry of the surface water body's river basin district (except for territorial waters).	If the distance between the source geometry and the target geometry is less than 25 metre, then only a 'WARNING' is raised.
SS10	RiverBasinDistrict	RiverBasinDistrict	The geometry of the river basin districts must not overlap each other.	If all the parts of the source geometry that overlap the target geometry have an area of less than 625 square metre, then only a 'WARNING' is raised.
SS11	SubUnit	SubUnit	The geometry of the subunits must not overlap each other.	If all the parts of the source geometry that overlap the target geometry have an area of less than 625 square metre, then only a 'WARNING' is raised.
SS12	SurfaceWaterBody	SurfaceWaterBody	The geometry of polygon surface water bodies must not overlap each other.	If all the parts of the source geometry that overlap the target geometry have an area of less than 625 square metre, then only a 'WARNING' is raised.
SS13	SurfaceWaterBody	SurfaceWaterBodyLine	The geometry of polygon surface water bodies and the geometry of line surface water bodies must be disjoint or only touch at the boundary.	If all the parts of the geometry that are not disjoint have a length of less than 25 square metre, then only a 'WARNING' is raised.
SS14	SurfaceWaterBodyLine	SurfaceWaterBody	The geometry of polygon surface water bodies and the geometry of line surface water bodies must be disjoint or only touch at the boundary.	If all the parts of the geometry that are not disjoint have a length of less than 25 square metre, then only a 'WARNING' is raised.
SS15	SurfaceWaterBodyLine	SurfaceWaterBodyLine	The geometry of line surface water bodies must not overlap each other.	If all the parts of the geometry that are not disjoint have a length of less than 25 square metre, then only a 'WARNING' is raised.
SS16	GroundWaterBody	GroundWaterBody	Groundwater bodies at the same depth must not overlap.	If all the parts of the source geometry that overlap the target geometry have an area of less than 625 square metre, then only a 'WARNING' is raised.
SS17	GroundWaterBodyHorizon	GroundWaterBody	The spatial union of the geometries of the different horizons must be equal to the geometry of the groundwater body.	If all the parts of the source geometry that are not equal to the target geometry have an area of less than 625 square metre, then only a 'WARNING' is raised.
SS18	SurfaceWaterBodyCentreline	SurfaceWaterBody	The geometry of a virtual line must be covered by the geometry of the polygon surface water body.	If all the parts of the geometry that are not covered have a length of less than 25 square metre, then only a 'WARNING' is raised.

Figure 14. Conditions for use of data sets of country boundaries in the scope of the WFD related reporting obligations.

European Environment Agency

21.10.2015

Notice: Conditions for use of spatial data sets of country boundaries in the scope of the Water Framework Directive related reporting obligations

The data sets are the extracts from the EuroGeographics EuroBoundaryMap version 9.1 product that is used in the European Environment Agency (EEA) and documented with the metadata according to the EEA Spatial Data Infrastructure.

EuroBoundaryMap data and metadata are copyright of EuroGeographics and the contributing National Mapping and Cadastral Agencies.

The use of the spatial data sets is limited to the internal use for the alignment of the national reporting data in the scope of the Water Framework Directive related reporting obligations.

The data sets can be used:

- as geographic reference,
- for deriving new geographic datasets by applying data manipulation procedures,
- for spatial analysis or for the production of maps, publications, posters, presentations and statistical analysis within the scope of the reporting data for WFD.

This spatial data set in resolution 1:100.000 is not allowed to be downloadable from the Internet for public use.

The source of data has to be acknowledged and the data shall not be used for commercial purpose.

By downloading the spatial data sets of the country boundaries, the data providers involved in the Water Framework Directive related reporting obligations accept these conditions for use.

Coordinate reference systems

The spatial data sets must be provided in one of the following coordinate reference systems (CRS):

- ETRS89-GRS80 (urn:ogc:def:crs:EPSG::4258)
- ETRS89-LAEA (urn:ogc:def:crs:EPSG::3035)
- WGS 84 (urn:ogc:def:crs:EPSG::4326)

The geometry of spatial objects should be reported in the ETRS89-GRS80 geodetic coordinate system (urn:ogc:def:crs:EPSG::4258). For areas outside the scope of ETRS89, such as overseas territories, WGS 84 (urn:ogc:def:crs:EPSG::4326) must be used.

The geometry of spatial objects may also be reported in the ETRS89-LAEA projected coordinate system (urn:ogc:def:crs:EPSG::3035). Again, an exception applies for areas outside the scope of ETRS89, where the geodetic coordinate system WGS 84 (urn:ogc:def:crs:EPSG::4326) must be used.

Note that for the quality control procedures applied to the spatial data, the ETRS89-LAEA projected coordinate system will be used.

Projection metadata files (.prj)

Valid projection metadata files (.prj) for the *shapefile* format are provided below:

- For ETRS89-GRS80 (urn:ogc:def:crs:EPSG::4258)

```
GEOGCS["ETRS89",DATUM["D_ETRS_1989",SPHEROID["GRS_1980",6378137.0,298.257222101]],PRIMEM["Gree
nwich",0.0],UNIT["Degree",0.0174532925199433]]
```

- For ETRS89-LAEA (urn:ogc:def:crs:EPSG::3035)

```
PROJCS["ETRS_1989_LAEA",GEOGCS["GCS_ETRS_1989",DATUM["D_ETRS_1989",SPHEROID["GRS_1980",6378137
.0,298.257222101]],PRIMEM["Greenwich",0.0],UNIT["Degree",0.0174532925199433]],PROJECTION["Lamb
ert_Azimuthal_Equal_Area"],PARAMETER["False_Easting",4321000.0],PARAMETER["False_Northing",321
0000.0],PARAMETER["Central_Meridian",10.0],PARAMETER["Latitude_Of_Origin",52.0],UNIT["Meter",1
.0]]
```

- For WGS 84 (urn:ogc:def:crs:EPSG::4326)

```
GEOGCS["GCS_WGS_1984",DATUM["D_WGS_1984",SPHEROID["WGS_1984",6378137.0,298.257223563]],PRIMEM[
"Greenwich",0.0],UNIT["Degree",0.0174532925199433]]
```

Metadata

A metadata file must be provided for each spatial data file. As defined in the "CIS Guidance Document No. 22":

> *Since the majority of WISE datasets and services will fall under the scope of INSPIRE, this guidance recommends the adoption of a profile which extends the INSPIRE metadata to include all those additional elements already agreed by the WISE community. This guidance recommends the use of INSPIRE terminology for element names wherever possible, thus ensuring compatibility with metadata created in other environmental policy areas.*

The content and structure of the metadata file must be in conformance to the "INSPIRE Metadata Implementing Rules: Technical Guidelines based on EN ISO 19115 and EN ISO 19119":

> *The use of these guidelines to create INSPIRE metadata ensures that the metadata is not in conflict with ISO 19115.*
> *However, full conformance to ISO 19115 implies the provision of additional metadata elements which are not required by the INSPIRE Implementing Rule on Metadata. Additional metadata elements are required by the INSPIRE Implementing Rules for the Interoperability of Spatial Datasets and Services. An overview list of these additional elements is provided in Annex B.*

In practice, this means that the INSPIRE metadata requirements must be met (including the metadata elements for interoperability defined in Annex B of the INSPIRE Metadata Implementing Rules). Conformance with ISO 19115 is encouraged but not strictly required. A specific WISE metadata profile is no longer required.

The authoring and editing of metadata files can be done in a number of ways including the use of a metadata editor capable of exporting an XML file conformant to the ISO 19139 schema. See, for example, the editor and the validator available at the INSPIRE Geoportal (http://inspire-geoportal.ec.europa.eu).

INSPIRE metadata requirements for specific themes

The INSPIRE Data Specification on Area Management/Restriction/Regulation Zones and Reporting Units sets specific requirements for the metadata: see section 8 (Dataset-level metadata) of the specification document.

These requirements must be followed for the RiverBasinDistrict, SubUnit, SurfaceWaterBody, SurfaceWaterBodyLine, GroundWaterBody, ProtectedArea, ProtectedAreaLine, ProtectedAreaPoint data sets.

Note 1: Currently no such requirements exist for the MonitoringSite data set.

WISE reporting guidance for specific metadata elements

Table 10. WISE reporting guidance for specific metadata elements.

Metadata element	Reporting guidance
2.1 Topic category	Select at least option 012 (inlandWaters). This element is required.
3.1 Keyword value	Select the appropriate keywords from the WISE metadata keywords list (http://converters.eionet.europa.eu/xmlfile/WISE_metadata_keywords_1.xml) and identify the corresponding vocabulary. This element is required.
5.1 Temporal extent	Provide the period covered by the spatial data reported. The period should be defined by the planning period for which the real-world entities are expected to be valid. This element is required.
5.2 Date of publication	Provide the date of the reporting deadline of the period specified with Metadata element 5.1. This element is required.
5.3 Date of last revision	Provide the date of the last submitted update to the data set. This element is required.
8.2. Limitations on public access	Limitations on public access, if any, must be clearly stated in the metadata. If no restrictions are stated, Category 3 will be applied (see the Data policy section, below). Note that, for safety or security reasons, Data Providers may flag that the location of some monitoring sites (e.g. drinking water abstractions) must not be published. These restrictions are set at record-level and are always applied, regardless of the classification of the data set.

Figure 15. Reporting dates in the metadata files (example).

Table 11. Reporting dates in the metadata files (see also Figure 15).

Submission	Temporal extent	Date of publication	Date of last revision
1	From 2010-03-22 to 2016-03-22	2010-03-22	2010-03-22
2	From 2010-03-22 to 2016-03-22	2010-03-22	2010-09-17
3	From 2016-03-22 to 2022-03-22	2016-03-22	2016-03-22
4	From 2022-03-22 to 2028-03-22	2022-03-22	2022-03-22

Data exchange

Character encoding

The character encoding for all data and metadata files must be UTF-8.

File formats

The spatial data sets must be reported using **GML** files.

Data Providers may prepare the data using the *shapefile* format. *Shapefile* templates are available, and a *shapefile* to GML conversion tool is also provided (see below).
The GML files resulting from this conversion must be uploaded to the delivery envelope in CDR.
The *shapefiles* must not be uploaded to the delivery envelope.

Some restrictions were adopted in the schemas to allow a similar description of the data sets regardless of the file format (GML or *shapefile*). For example, each type of geometry is reported in a separate data file (due to the limitations of the *shapefile* format).
See the CDR help page for further information (http://cdr.eionet.europa.eu/help/WFD/WFD_521_2016).
(For countries reporting only under WISE SoE, see http://cdr.eionet.europa.eu/help/WISE_SoE/wise5.)

GML format

The schemas are available in the Data Dictionary (http://dd.eionet.europa.eu/schemaset/WFD2016/view).

Shapefile format

Shapefile templates are provided in the CDR help page. The templates must be used when preparing the data and using the conversion tools to from *shapefile* to GML.

Shapefiles must have the three structural files (*.shp, *.shx and *.dbf) and the *.prj and *.cpg files.
Shapefiles without the *.prj projection file (or with an incorrect definition of the coordinate system) will not be processed by the conversion tools. The *.cpg file is also mandatory as it is explicitly identifies the character encoding used in the *.dbf file. Remember that the mandatory encoding is UTF-8.
Shapefiles with different fields in the attribute table will not be processed. This includes: additional fields, different field names or different field types. Note that the field names in a *shapefile* must have a maximum of 10 characters, so a "short" version of the GML names was defined for the *shapefile* templates (see the "Quick Reference Card" in page 70).

The DBF format used in the *shapefile* attribute table does not support NULL values (i.e. there is no difference between a NULL string and an empty string, or between a NULL value and a zero value). Also the structure of the table is fixed for all records (i.e. even if an optional attribute is not provided or is not applicable to a given record). To circumvent these limitations, Data Providers are requested to explicitly provide the conventional null values depending on the field type:

- Use '**NotApplicable**' for string fields;
- Use **-9999** for numeric fields;
- Use **9999-12-31** for date fields.

The DBF format has a maximum length of 254 characters for string fields. Be aware of this limitation.

File naming convention

The filenames of the spatial data sets must follow the following naming convention:

[DataSetType]_[CountryCode]_[Date]

Table 12. File naming convention.

Code	Description
[DataSetType]	Identification of the content of the data set. • RiverBasinDistrict • SubUnit • SurfaceWaterBody, for polygonal geometries • SurfaceWaterBodyLine, for linear geometries • GroundWaterBody • MonitoringSite • ProtectedArea, for polygonal geometries • ProtectedAreaLine, for linear geometries • ProtectedAreaPoint, for point geometries • SurfaceWaterBodyCentreline • GroundWaterBodyHorizon
[CountryCode]	Use the two-letter ISO code of the country (ISO 3166 alpha-2), except for Greece and the United Kingdom, for which the abbreviations EL and UK must be used. Spatial data is reported in national data sets, to guarantee the geometric consistency of the spatial objects and avoid the rejection of data set due to inconsistencies between partial deliveries. Partial deliveries are not accepted.
[Date]	Submission date in the format YYYYMMDD

Examples:

- RiverBasinDistrict_XZ_20160101
- SubUnit_XZ_20160101
- SurfaceWaterBody_XZ_20160101
- SurfaceWaterBodyLine_XZ_20160101
- GroundWaterBody_XZ_20160101
- MonitoringSite_XZ_20160101
- ProtectedArea_XZ_20160101
- ProtectedAreaLine_XZ_20160101
- ProtectedAreaPoint_XZ_20160101
- SurfaceWaterBodyCentreline_XZ_20160101
- GroundWaterBodyHorizon_XZ_20160101

The file extension depends on the file format.

- xml (for the metadata file)
- gml (for the spatial data file)

Data submission

Data must be uploaded in the Reportnet Central Data Repository (CDR).

Data Providers reporting under WFD are referred to the instructions provided in the Annex 6 of the WFD Reporting Guidance 2016. Collections have already been created in CDR for the reporting of spatial data:

- http://cdr.eionet.europa.eu/*{country_code}*/eu/wfd2016/spatial/

Data Providers reporting under WISE SoE are referred to the WISE SoE Reportnet Guidance. Collections have already been created in CDR for the reporting of spatial data:

- http://cdr.eionet.europa.eu/*{country_code}*/eea/wise_soe/wise5/

Resubmissions and updates

If data is resubmitted or updated, then complete data sets have to be uploaded.
Incomplete spatial data sets will not pass the referential integrity quality control and thus cannot be further processed.

Data policy

Under the "WISE Reporting Arrangements", Member States have agreed on the conditions applicable to spatial data (see Annex 1 of the WISE Reporting Arrangements). For ease of reference, an extract of the current agreement (dated 2007-03-01) is transcribed below. The agreement may be subject to future changes.

Data storage

The European Commission (EC) and the European Environmental Agency (EEA) will store the geographic datasets on servers managed and accessible by the staff of the EC and the EEA. DG Environment will distribute parts or the entire datasets within the Commission, the EEA and to contractors, these last for the sole purpose of activities executed for the Commission and/or the EEA and limited to the duration of those activities.

Data usage

The Commission and the EEA are authorised to use the geographic data in the context of environmental policy definition, implementation, assessment and analysis:

- As geographic reference, i.e. creating a geographical context for other data;
- For the production of maps, publications, posters, presentations, web sites and any other electronic publication on the Internet. Electronic publication will be in the form of image maps;
- For spatial and statistical analysis;
- For deriving new geographic datasets by applying data manipulation procedures, e.g. combining different geographic datasets, generalisation procedures including smoothing and dropping of spatial features, adding new attribute information;
- For inclusion of the geographic data in other applications provided that it will not possible to extract the original geographic data.

Data distribution

The Commission and the EEA are authorized to distribute geographic data, if

- The source is acknowledged and,
- The data is not used for commercial purpose – unless approved by the provider - and,
- The data provider has not explicitly restricted their dissemination beyond what specified at point 2

[…]Distribution media of geographic data are paper publications, electronic publications, offline distribution on physical supports (e.g. CD-ROMs) and online distribution via the Internet services. Geographic data may be distributed as feature services on the Internet or vector data on physical support, only if data distribution conditions are met as specified in the metadata.

The metadata related to the geographic data and the derived geographic data will be distributed via a data catalogue service within the Commission, the EEA and to the public without any restrictions.
An acknowledgement of source including statement on legal constraints on access and use of geographic data, where appropriate, will be supplied with geographic data and derived products as part of the metadata information or as an accompanying document. […]

Categories for distribution of geographic data and derived products as part [of the] metadata element on data constraints:

- Category 1: Internal use within Commission and EEA, publication as maps on paper or in electronic format as image maps.
- Category 2: Distribution of derived data and products under predefined conditions with the aim of decreasing the spatial accuracy or resolution of the geographic data.
- Category 3: Distribution of original data electronically as feature service or on physical support.

WISE spatial data set and INSPIRE themes

INSPIRE Area Management/Restriction/Regulation Zones and Reporting Units

Introduction

This section provides information about the relationship between the WISE spatial data sets and the INSPIRE AM theme (Annex III - Area Management/Restriction/Regulation Zones and Reporting Units).

This section provides information about the conceptual mapping between the elements in the WISE spatial data model and the elements in the INSPIRE AM data model. It also explains the basic differences between the schemas used in WISE and in INSPIRE.

Overview

The INSPIRE AM theme has a broad thematic scope: areas managed, regulated or used for reporting at international, European, national, regional and local levels, established in accordance with *specific legislative requirements* to deliver specific environmental objectives related to any environmental media (air, soil, water and biota).

It explicitly excludes areas established to manage, regulate and restrict activities to conserve nature, biodiversity and cultural heritage (only), which are covered under the INSPIRE PS theme (Annex I Protected Sites). However, areas with multiple environmental objectives that include nature and biodiversity conservation fall in the scope of the AM theme.

The following WISE spatial data sets are in the scope of the INSPIRE AM theme:

- River Basin Districts
- Sub-units
- Surface Water Bodies
- Groundwater Bodies
- Protected Areas

For informative purposes only, Figure 16 shows the part of the AM data model which is relevant for the WISE spatial data reporting.

Figure 16. Class diagram for the INSPIRE AM theme (informative only).

Required data elements

In the current WISE spatial data reporting, not all elements in the INSPIRE AM data model are requested:

- The environmentalDomain data element does not have to be reported, because it would have the fixed value 'Water' for all spatial data sets and objects.
- The competentAuthority data element does not have to be reported, because:
  - In the scope of the WFD reporting, the information on the River Basin District competent authorities is reported in the "non-spatial" XML files.
  - In the scope of the WFD reporting, this type of information is not requested for surface water bodies, groundwater bodies or protected areas.
  - In the scope of the WISE SoE reporting, information on competent authorities is not required.
- The **legalBasis** data elements are only requested for Protected Areas.

Important notes:

1. Data Providers implementing the INSPIRE Directive are still required include the above data elements in their INSPIRE visualisation and download services. The simplification adopted in WISE merely reflects the fact that not everything is strictly needed in the context of a specific reporting obligation (although it may be needed for other purposes).
2. Data Providers implementing the INSPIRE Directive are still required to use the INSPIRE schemas. The flat schemas presently adopted in WISE are not compliant with INSPIRE requirements.

Voidable data elements

In the current WISE spatial data reporting, the INSPIRE «voidable» stereotype is not used:

- WISE data elements with multiplicity 1..1 are required and must be provided.
- WISE data elements with multiplicity 0..1 are treated as conditional: if the information exists or is applicable, it must be provided.

Requesting further information associated with «voidable» characteristics (such as the *VoidReasonValue*) was presently deemed unnecessary.

Multiplicity of the data elements

Some INSPIRE data elements and associations can have many instances (i.e. multiplicity 0..* or 1..*).
In the WISE spatial data sets, data elements typically have a maximum of one instance (i.e. multiplicity 0..1 or 1..1). This change was required by the "flat" structure in the current WISE spatial data files.

The restriction in multiplicity was applied to the zoneType, thematicId, name, relatedZone and legalBasis elements.

Reporting the geometry

The INSPIRE AM theme does not restrict the type of geometry of spatial objects.
However in the WISE spatial data sets, a decision was taken to keep different types of geometry in separate data files. This allows the use of *shapefile format* (that does not support different types of geometry in the same file), if a Data Provider is not able to directly produce the GML files.
Also, in the current spatial data files, only 2D geometries are used (see Table 13).

Table 13. Geometry types for each WISE spatial data set.

Spatial data set	Geometry (GML)	Geometry (shapefile)
RiverBasinDistrict	GM_MultiSurface	Polygon
SubUnit	GM_MultiSurface	Polygon
SurfaceWaterBody	GM_MultiSurface	Polygon
SurfaceWaterBodyLine	GM_MultiCurve	Polyline
GroundWaterBody	GM_MultiSurface	Polygon
ProtectedArea	GM_MultiSurface	Polygon
ProtectedAreaLine	GM_MultiCurve	Polyline
ProtectedAreaPoint	GM_MultiPoint	Point

Reporting inspireId and thematicId

The flattened structure of the current WISE spatial data files required the "flattening" of INSPIRE complex data elements or data types.

The INSPIRE inspireId data element has a complex data type: Identifier.
In the WISE spatial data sets, it must be provided using 3 separate data elements:

- inspireIdLocalId;
- inspireIdNamespace;
- inspireIdVersionId.

Figure 17. INSPIRE Identifier data type (informative only).

The INSPIRE thematicId data element also has a complex data type: ThematicIdentifier.
In the WISE spatial data sets, it must be provided using 2 separate data elements:

- thematicIdIdentifier;
- thematicIdIdentifierScheme.

Figure 18. INSPIRE ThematicIdentifier data type (informative only).

For reporting purposes, the thematic identifier is very important: it is required to join the spatial data with other reported thematic information. Please refer to the section on “Identifier management” for further information.

Life-cycle information

Life-cycle information at spatial object level is reported using the **beginLifespanVersion** and **endLifespanVersion** elements. Dates must be reported using the ISO 8601 extended format:

- YYYY-MM-DD, for days;
- YYYY-MM, for months;
- YYYY, for years.

(If necessary, or convenient, time values can be reported. The ISO 8601 extended format for UTC time should be used.)

Reporting predecessors and successors

The need to manage life-cycle information in the WISE spatial data sets is identified in CIS Guidance Document No. 22 (2009):

> *"Depending on the data, the reporting obligations and the intended use of the data, it will be necessary to establish a system that manages temporal changes of non-hydrological features including the identification of predecessors and successors.*
> *Changes will occur from one reporting period to another (submission of datasets according to reporting deadlines) but also in between reporting periods (update/resubmission of datasets)."*

The concept of predecessors and successors does not exist in the INSPIRE AM theme.
However, the INSPIRE SU theme (Annex III - Statistical Units) data specification extensively discusses the issue of changes in statistical units (see Annex F), and provides the necessary concepts and data elements.

For information purposes only, part of the INSPIRE SU theme data model is represented Figure 19.

Figure 19. Class diagram INSPIRE SU theme (informative only).

In the INSPIRE SU theme, changes are represented through the elements validityPeriod, beginLifeSpanVersion and endLifeSpanVersion. The validityPeriod in the SU theme can be considered functionally equivalent to the designationPeriod in the AM theme.

Additional information about the lineage is represented using two elements:

- predecessors, which identifies the object(s) that the current object replaces;
- successors, which identifies the object(s) that replace the current object.

Finally, the INSPIRE evolutions element is used to clarify the type of event (aggregation, splitting, etc.) that generated the current object.

In the WISE spatial data sets, these concepts are adopted.
Predecessors are identified through their thematic identifiers, using two elements:

- predecessorsIdentifier, which must contain a comma-separated list of the identifiers of the object(s) that have been deactivated/replaced by the presently reported object;
- predecessorsIdentifierScheme, which must contain the identifiers' scheme.

These elements are conditional: predecessors must be reported if the current object is replacing something. Predecessors must be identified even if their geometry (or other information) has never been reported.
For example, if surface water body 'ZZ1234' is the aggregation of surface water body 'ZZ12' and surface water body 'ZZ34' previously reported, then 'ZZ12' and 'ZZ34' must be reported as predecessors of 'ZZ1234'.

Successors are also identified through their thematic identifiers, using two elements:

- successorsIdentifier, which must contain a comma-separated list of the identifiers of the object(s) that have replaced the presently reported object;
- successorsIdentifierScheme, which must contain the identifiers' scheme.

Again, these elements are conditional: successors must be reported if they exist. Successors must be identified even if their geometry (or other information) has never been reported.

The wiseEvolutionType element explicitly states what type of event generated the object.
This element is mandatory (even if there are no predecessors or successors to be reported).

The following allowable values have the same meaning defined in the INSPIRE SU theme: 'creation', 'deletion', 'aggregation', 'splitting' and 'change'.

For the purposes of the WISE reporting, the change types required in the WFD reporting were added: 'changeCode', 'changeBothAggregationAndSplitting', 'changeExtendedArea', 'changeExtendedDepth', 'changeExtendedAreaAndDepth', 'changeReducedArea', 'changeReducedDepth', 'changeReducedAreaAndDepth', 'noChange'.

The 'noChange' option must not be used if predecessors or successors are reported for a given spatial object. A typical example for the use of the 'noChange' option is the reporting of a water body that had no changes in the geometry and in the identifier since the 1st RBMP reporting cycle.

The 'deletion' option must be used if an object that is no longer valid is reported. A typical example for the use of the 'deletion' option is the optional reporting of a water body that was valid in the 1st RBMP reporting cycle (but whose geometry was not previously reported) but that is no longer valid in the 2016 reporting cycle. (Note that these objects are not subject to the spatial quality control check applicable to other objects).

Reporting geographical names

Data Providers are requested to report the geographical name of each object in a national language and to identify the national language used. Optionally, an English language version of the name is also requested, if available.

In any INSPIRE theme, geographical names should be represented using the generic mechanism proposed under the Geographical Names data specification (see INSPIRE Annex I Geographical Names data specifications), which uses the complex data type GeographicalName. Only the data elements represented in Figure 20 were deemed strictly necessary:

Figure 20. INSPIRE GeographicalName data type (informative only).

In the WISE spatial data sets, the following data elements are used:

- **nameText**, with the name in a national language (equivalent to the text data element in the INSPIRE SpellingOfName data type);
- **nameLanguage**, with the ISO 639-2/B code of the national language (equivalent to the language data element of the INSPIRE GeographicalName data type);
- **nameTextInternational**, an optional element with an English exonym or an understandable English version of the name of the geographical feature or spatial object (in this case, the language element is not requested).

Note that the same mechanism is used for all WISE spatial data sets (e.g. river basin districts, water bodies, etc.).

Reporting the designationPeriod

The INSPIRE designationPeriod data element has a TM_Period data type.
The TM_Period data type has a relatively complex structure.

Figure 21. TM_Period data type (informative only).

In the current WISE spatial data reporting, this structure was simplified and includes only two data elements:

- **designationPeriodBegin** with the start date;
- **designationPeriodEnd** with the end date.

The designationPeriodEnd data element is optional (i.e. has multiplicity 0..1): it does not need to be provided if the end of the time period is indeterminate or currently unknown.

The dates must be reported in the ISO 8601 extended format:

- YYYY-MM-DD, for days;
- YYYY-MM, for months;
- YYYY, for years.

Reporting zoneType and specialisedZoneType

The INSPIRE zoneType and specialisedZoneType data elements allow users to locate and filter information about different types of AM zones.

In the current WISE spatial data reporting, each type of AM zone is reported in a separate data file.
In theory, the zone type could be inferred from the file name or from its associated schema. However, for quality control purposes, it is important to keep the zoneType and specialisedZoneType elements in the data model, even if all objects in a given data file have the same value (e.g. all river basin districts have the same zone type). Table 14 details the valid code list values for each type of spatial object.

Important note: It is not necessary to report the spatial data for areas protected under the Habitats Directive or the Birds Directive, since that information is reported via the Natura2000 data flow. Also note that those protected areas are in the scope of the INSPIRE **Protected Sites** (PS) theme, and not in the scope of the INSPIRE AM theme.

Table 14. Valid zoneType and specialisedZoneType values for each WISE spatial data set.

Object type	zoneType value	specialisedZoneType value
RiverBasinDistrict	riverBasinDistrict	-- not applicable --
SubUnit	riverBasinDistrict	riverBasinDistrictSubUnit
SurfaceWaterBody	waterBody	riverWaterBody lakeWaterBody transitionalWaterBody coastalWaterBody
		territorialWaters
GroundWaterBody	waterBody	groundwaterBody
ProtectedArea	nitrateVulnerableZone sensitiveArea bathingWaters drinkingWaterProtectionArea	-- not applicable --
	designatedWaters	shellfishDesignatedWater freshwaterFishDesignatedWater otherProtectedArea

Reporting the legalBasis information

In the current WISE spatial data reporting, the INSPIRE legalBasis information is only requested for Protected Areas. Figure 22 illustrates the relevant data elements in the INSPIRE AM data model.

Figure 22. INSPIRE LegislationCitation (informative only).

In the current WISE spatial data reporting, the following 3 data elements are used:

- **legalBasisName** with the official name of the legislative instrument;
- **legalBasisLink** with a link to an online version of the document;
- **legalBasisLevel** with the level at which the legislative instrument is adopted (allowable values are 'european', 'international', 'national', or 'sub-national').

Reporting relatedZone information

In the INSPIRE AM model, the **relatedZone** association allows one ManagementRestrictionOrRegulationZone object to be "linked" to zero or more ManagementRestrictionOrRegulationZone objects. In the current WISE spatial data reporting, the relatedZone association has a more restricted meaning (see Figure 29 in page 53):

- Each SubUnit is related to one and only one RiverBasinDistrict;
- Each SurfaceWaterBody is related to one and only one SubUnit;
- Each GroundWaterBody is related to one and only one RiverBasinDistrict.

Each related zone is identified using its thematic identifier, which requires the following 2 data elements:

- relatedZoneIdentifier and
- relatedZoneIdentifierScheme.

Specifically for transboundary water bodies, a common identifier may be reported using:

- relatedZoneTransboundaryIdentifier and
- relatedZoneTransboundaryIdentifierScheme.

Note 1: A centralised registry of transboundary identifiers will not be kept in WISE (because the management of the identifiers is in the scope of each international river basin district, or set of neighbouring countries). Transboundary identifiers are not required to follow the WISE syntax rules.

Note 2: Some water bodies are associated with protected areas: in the WFD reporting, this information is provided via the "non-spatial" thematic reporting. In the scope of WISE SoE, this information is not required.

Data elements specific to WISE

The following additional WISE data elements are not related to INSPIRE elements: sizeValue, sizeUom, meanDepth, horizons and link.

INSPIRE Environmental Monitoring Facilities

Introduction

This section provides information about the relationship between the WISE spatial data sets and the INSPIRE EF theme (Annex III - Environmental Monitoring Facilities).

This section provides information about the conceptual mapping between the data elements in the WISE spatial data model and the data elements in the INSPIRE EF data model. It also explains the basic differences between the data schemas used in WISE and in INSPIRE.

Overview

The INSPIRE EF theme covers the "*location and operation of environmental monitoring facilities includes observation and measurement of emissions, of the state of environmental media and of other ecosystem parameters (biodiversity, ecological conditions of vegetation, etc.) by or on behalf of public authorities*". The EF theme allows the representation of Environmental Monitoring Facilities, Networks, Activities and Programmes.
In the current WISE spatial data reporting, only the aspects related to Environmental Monitoring Facilities (e.g. monitoring sites) are covered in the spatial data sets.

The following WISE spatial data sets are related to the INSPIRE EF theme:

- Monitoring Sites

For informative purposes only, the following diagram shows the part of the EF data model which is relevant for the WISE spatial data reporting.

Figure 23. Class diagram for the INSPIRE EF theme (informative only).

Required data elements

In the current WISE spatial data reporting, not all elements in the INSPIRE EF data model are requested:

- The measurementRegime or mobile nature of the environmental monitoring facility is not requested;
- Only information about the featureOfInterest is requested with regard to the observingCapability;
- Only a "global" operationalActivityPeriod is requested.

Important notes:

1. Data Providers implementing the INSPIRE Directive are still required include the above data elements in their INSPIRE visualisation and download services. The simplification adopted in WISE merely reflects the fact that not everything is strictly needed in the context of a specific reporting obligation (although it may be needed for other purposes).

1. Data Providers implementing the INSPIRE Directive are still required to use the INSPIRE schemas. The flat schemas presently adopted in WISE are not compliant with INSPIRE requirements.

Voidable data elements

In the current WISE spatial data reporting, the INSPIRE «voidable» stereotype is not used:

- WISE data elements with multiplicity 1..1 are required and must be provided.
- WISE data elements with multiplicity 0..1 are treated as conditional: if the information exists or is applicable, it must be provided.

Requesting further information associated with «voidable» characteristics (such as the VoidReasonValue) was presently deemed unnecessary.

Multiplicity of the data elements

Some INSPIRE data elements and associations can have many instances (i.e. multiplicity 0..* or 1..*).
In the WISE spatial data sets, data elements typically have a maximum of one instance (i.e. multiplicity 0..1 or 1..1).
This change was required by the "flat" structure in the WISE spatial data files.

The restriction in multiplicity was applied to the following INSPIRE elements: name, mediaMonitored, purpose, relatedTo and operationalActivityPeriod.

Reporting the geometry

The INSPIRE EF theme does not restrict the type of geometry of spatial objects.
However in the WISE MonitoringSite data set, 2D points must be used. If the reference geometry is a path (i.e. for mobile stations) or an area, then a representative point must be provided.

Table 15. Allowed geometry types for the MonitoringSite spatial data set.

Spatial data set	Geometry (GML)	Geometry (shapefile)
MonitoringSite	GM_Point	Point

Reporting inspireId and thematicId

The flattened structure of the current WISE spatial data files required the "flattening" of INSPIRE complex data elements or data types.

The INSPIRE inspireId data element has a complex data type: Identifier.
In the WISE spatial data sets, it must be provided using 3 separate data elements:

- inspireIdLocalId;
- inspireIdNamespace and
- inspireIdVersionId.

Figure 24. INSPIRE Identifier data type (informative only).

Unlike other INSPIRE Annex III themes, the EF data specification does not foresee the need for thematic identifiers. However, monitoring sites can be known by different codes, depending on the context of their use in reporting obligations. For this reason, a thematic identifier is also needed and used in the WISE MonitoringSite data set.
Data Providers reporting under WFD must use the European code of the monitoring site.
Data Providers reporting under WISE SoE must report EIONET monitoring sites that are not WFD monitoring sites: in this situation the EIONET monitoring site code is used as the thematic identifier. Examples are provided in the section on "Identifier management".

The INSPIRE thematicId data element also has a complex data type: ThematicIdentifier.
In the WISE spatial data sets, it must be provided using 2 separate data elements:

- thematicIdIdentifier, and
- thematicIdIdentifierScheme.

Figure 25. INSPIRE ThematicIdentifier data type (informative only).

For reporting purposes, the thematic identifier is very important: it is required to join the spatial data with other reported thematic information. Please refer to the section on "Identifier management" for further information.

Life-cycle information

Life-cycle information at spatial object level is reported using the **beginLifespanVersion** and **endLifespanVersion** elements. Dates must be reported using the ISO 8601 extended format:

- YYYY-MM-DD, for days;
- YYYY-MM, for months;
- YYYY, for years.

(If necessary, or convenient, time values can be reported. The ISO 8601 extended format for UTC time should be used.)

Reporting predecessors and successors

The need to manage life-cycle information in the WISE spatial data sets is identified in Guidance Document No. 22 (2009):

> *"Depending on the data, the reporting obligations and the intended use of the data, it will be necessary to establish a system that manages temporal changes of non-hydrological features including the identification of predecessors and successors.*
> *Changes will occur from one reporting period to another (submission of datasets according to reporting deadlines) but also in between reporting periods (update/resubmission of datasets)."*

In the INSPIRE EF theme, the concept of predecessors and successors is encoded using the associations supersedes and supersededBy, respectively. (Please refer to the section on "Reporting predecessors and successors" for Areas of Management for further information).

Predecessors are identified through their thematic identifiers, using two elements:

- **supersedesIdentifier**, which must contain a comma-separated list of the identifiers of the object(s) that have been deactivated/replaced by the presently reported object;
- **supersedesIdentifierScheme**, which must contain the identifiers' scheme.

These elements are conditional: predecessors must be reported if the current object is replacing something. Predecessors must be identified even if their geometry (or other information) has never been reported.

Successors are also identified through their thematic identifiers, using two elements:

- **supersededByIdentifier**, which must contain a comma-separated list of the identifier of the object(s) that have replaced the presently reported object;
- **supersededByIdentifierScheme**, which must contain the identifiers' scheme.

Again, these elements are conditional: successors must reported if they exist. Successors must be identified even if their geometry (or other information) has never been reported.

The **wiseEvolutionType** element explicitly states what type of event generated the object.
This element is mandatory (even if there are no predecessors or successors to be reported).

Reporting geographical names

Data Providers are requested to report the geographical name of each object in a national language and to identify the national language used. Optionally, an English language version of the name is also requested, if available.

In any INSPIRE theme, geographical names should be represented using the generic mechanism proposed under the Geographical Names data specification (see INSPIRE Annex I Geographical Names data specifications), which uses the complex data type GeographicalName. Only the data elements represented in Figure 20 were deemed strictly necessary:

Figure 26. INSPIRE GeographicalName data type (informative only).

In the WISE spatial data sets, the following data elements are used:

- **nameText**, with the name in a national language (equivalent to the text data element in the INSPIRE SpellingOfName data type);
- **nameLanguage**, with the ISO 639-2/B code of the national language (equivalent to the language data element of the INSPIRE GeographicalName data type);
- **nameTextInternational**, an optional element with an English exonym or an understandable English version of the name of the geographical feature or spatial object (in this case, the language element is not requested).

Reporting the operationalActivityPeriod

The INSPIRE **operationalActivityPeriod** data element has a TM_Period data type.
The TM_Period data type has a relatively complex structure.

Figure 27. TM_Period data type (informative only).

In the current WISE spatial data reporting, this structure was simplified and includes only two data elements:

- operationalActivityPeriodBegin with the start date;
- operationalActivityPeriodEnd with the end date.

The operationalActivityPeriodEnd data element is optional (i.e. has multiplicity 0..1): it does not need to be provided if the end of the time period is indeterminate or currently unknown (meaning that the monitoring site is still operational).

The dates must be reported in the ISO 8601 extended format:

- YYYY-MM-DD, for days;
- YYYY-MM, for months;
- YYYY, for years.

Note that only one "global" operational period is requested. While this simplification does not allow the reporting of inactivity periods (which would be possible under the INSPIRE structure), a decision was taken to keep the structure as simple as possible - and similar to the one used to the designationPeriod applicable to areas of management.

Reporting the featureOfInterest

Each monitoring site is providing observation data for a given water body: its featureOfInterest.

In the INSPIRE EM theme, monitoring facilities have zero or more observingCapability over a given domain or featureOfInterest. As explained above, in the current WISE spatial data reporting, the featureOfInterest association has a very restricted meaning: it allows the identification of the water body being monitored.

In the WISE spatial data sets, the featureOfInterest association is implemented using the thematic identifier, which requires the following 2 data elements:

- featureOfInterestIdentifier and
- featureOfInterestIdentifierScheme.

Please refer to the section on "Identifier management" for further information.

Reporting relatedTo information

In the INSPIRE EF model, the **relatedTo** association allows one EnvironmentMonitoringFacility object to be "linked" to any other type of spatial object.

In the WISE spatial data sets, the relatedTo association is implemented using the thematic identifier, which requires the following 2 data elements:

- relatedToIdentifier and
- relatedToIdentifierScheme.

In the current WISE spatial data reporting, the relatedTo association has a very restricted meaning: it is required <u>only</u> if a WFD monitoring site is also an EIONET monitoring site.
If this happens, then the EIONET monitoring site code must be provided in relatedToIdentifier element, while the relatedToIdentifierScheme takes the value 'eionetMonitoringSiteCode'.

Please refer to the section on "Identifier management" for further information.

Reporting mediaMonitored information

In the WISE spatial data sets, the mediaMonitored is reported using 3 Boolean elements:

- mediaMonitoredBiota;
- mediaMonitoredWater;
- mediaMonitoredSediment.

In the scope of the WFD reporting, the relevant information is that related to the WFD monitoring programmes (see the relevant elements under the Monitoring schema for the non-spatial data).

Reporting monitoring purpose information

In the WISE spatial data sets, the **purpose** data element must be reported using a comma-separated list of monitoring purposes, based on the set of allowable values defined for the WFD and WISE SoE reporting. Table 16 presents the valid 3-letter codes (see column "Notation") for the different monitoring purposes.

Table 16. Monitoring purpose of monitoring sites (PurposeOfCollection code list).

Notation	Label
	Monitoring programme
SUR	Surveillance monitoring
OPE	Operational monitoring
INV	Investigative monitoring
	Trend and status assessment
ECO	Ecological status
CHE	Chemical status
QUA	Quantitative status
TRE	Chemical trend assessment
	Protected area
DWD	Drinking water - WFD Annex IV.1.i
SHE	Shellfish designated waters - WFD Annex IV.1.ii
BWD	Recreational or bathing water - WFD Annex IV.1.iii
UWW	Nutrient sensitive area under the Urban Waste Water Treatment Directive - WFD Annex IV.1.iv
NID	Nutrient sensitive area under the Nitrates Directive - WFD Annex IV.1.iv
HAB	Protection of habitats or species depending on water - WFD Annex IV.1.v
	Transboundary monitoring
RIV	International network of a river convention (including bilateral agreements)
SEA	International network of a sea convention
INT	International network of other international convention
SOE	EIONET State of Environment monitoring
QTY	Water quantity
LEV	Water quantity - groundwater level
FLO	Water quantity - streamflow
GWA	Groundwater abstraction site
AGR	Groundwater abstraction site for irrigation
IND	Groundwater abstraction site for industrial supply
DRI	Groundwater abstraction site for human consumption
MAR	Transitional, coastal or marine monitoring site
SPA	Spatial distribution monitoring
TTM	Temporal trend monitoring
RIN	Riverine inputs
	Other monitoring purpose or network
MSF	Marine Strategy Framework Directive monitoring network
REF	Reference network monitoring site

Data elements specific to WISE

The following additional WISE data elements are not related to INSPIRE elements: catchmentArea, maximumDepth, confidentialityStatus and link.

Identifier management

Overview

The requirements for life-cycle information in the WISE spatial data sets are stated in the following excerpt of the CIS Guidance Document No 22 (section 4.4.4):

> *The management of the identifiers and codes at European level will include:*
> - *The publication of the identifiers/codes in WISE and the description of their development;*
> - *The registration of the namespace used (including entity type codes if used);*
> - *The description of life-cycle rules of the spatial objects of the WISE Reference GIS datasets;*
> - *An explanation if identifiers/codes have been changed or new identifiers/codes have been created (e.g. change of RBDs or Sub-units) during an update.* […]
> - *The description how Member States should use the identifiers/code, including how the referencing of objects provided by Member States to the objects of the WISE Reference GIS datasets will be performed.*

This section provides an overview on issues related to identifier management for the spatial objects in the different WISE spatial data sets, namely:

- The use of thematic identifiers to uniquely identify spatial objects in WISE;
- The possible relationship between thematic identifiers and INSPIRE identifiers (for countries implementing the INSPIRE Directive).

It also provides practical information and examples on:

- How to use the thematic identifiers to report the WFD and EIONET code of an object that was reported under different data flows;
- How to use the thematic identifiers to relate a monitoring site to a water body, a water body to a sub-unit or a river basin district, etc.

Please refer to the section on “Life-cycle management” for additional information on:

- How to report changes in the water bodies (e.g. from the 2010 WFD delineation to the 2016 WFD delineation) and other spatial objects;
- How to report changes in monitoring sites (e.g. changes in the identifiers, or changes in the monitoring site itself that do not ‘break’ the existing time series).

Using thematic identifiers

What is a thematic identifier?

Thematic identifiers are identifiers of real-world phenomena. The concept was introduced in the INSPIRE Annex II/III data models, recognising that a given spatial object may be known under different "codes" depending on the thematic context or the reporting obligation:

> *"Multiple thematic object identifiers may be assigned to a zone where different data exchange requirements (e.g. national vs European reporting) have defined different lexical rules for thematic object identifiers. Where multiple thematic object identifiers exist all should be provided. This shall allow external datasets that use these thematic object identifiers for referencing to link to the INSPIRE spatial object."*

To fulfil this requirement, the INSPIRE Annex II/III data models introduced a new base type named ThematicIdentifier, which is composed of two elements: identifier and identifierScheme.

Figure 28. INSPIRE ThematicIdentifier data type (informative only).

Identifiers must be unique within each identifier scheme.
Most INSPIRE Annex II/III data models include a thematicID element, with multiplicity 0..*, and ThematicIdentifier data type.

Furthermore, according to the INSPIRE Generic Conceptual Model (D2.5_v3.4rc3):

> *INSPIRE data models should aim at not duplicating information that is already covered by existing reporting data flows in order not to create an additional burden on Member States. Since reporting obligations and the maturity of data flows and reporting sheets differ in the different INSPIRE themes, the following specific principles should be applied:*
>
> - *Where there are existing and well-established data flows for reporting data from Member States to the Commission / EEA, INSPIRE data models should be limited to providing spatial objects and attributes that allow "joining" the reporting data to the spatial objects (e.g. external object identifiers or thematic identifiers).*

In the WISE spatial data models, thematic identifiers are adopted to "join" the non-spatial data (in the different reporting obligations) to the spatial objects.
Given that complex XML data types are avoided in the current WISE spatial data models, two elements are always used to encode the thematic identifier:

- thematicIdIdentifier and
- thematicIdIdentifierScheme.

Using thematic identifiers to identify WISE monitoring sites, water bodies, etc.

Thematic identifiers are used for monitoring sites, water bodies, river basin districts and sub-units, and protected areas. The identifier scheme (i.e. the scope within which a code is valid) varies according to the object type and according to the data flow that establishes the reporting obligation.

Table 17. Valid identifier schemes in the different WISE spatial object types.

Spatial Object	WFD Reporting Identifier Scheme	WISE SoE Reporting Identifier Scheme
MonitoringSite	'euMonitoringSiteCode'	'eionetMonitoringSiteCode'
SurfaceWaterBody	'euSurfaceWaterBodyCode'	'eionetSurfaceWaterBodyCode'
GroundWaterBody	'euGroundWaterBodyCode'	'eionetGroundWaterBodyCode'
SubUnit	'euSubUnitCode'	'eionetSubUnitCode'
RiverBasinDistrict	'euRBDCode'	'eionetRBDCode'

An identifier scheme typically provides a list of the currently valid identifiers, specifies a syntax for any valid identifier, and has defined procedures for maintenance.
In practice, this means that WISE will maintain "lists" of codes for different types of spatial objects. Some objects may have valid identifiers in two different lists. For example, a WFD monitoring that was also reported under the EIONET WISE SoE data flow, may have been reported with different identifiers in the two data flows. In this situation, the WFD identifier is always the preferred identifier (i.e. the code which is valid in the 'euMonitoringSiteCode' scheme). The objective is, at least for EU Member States, to use the 'eionetMonitoringSiteCode' scheme only for very specific situations (see the section "Special case: reporting monitoring sites under WISE SoE") – and to keep track of time series reported in the past (e.g. monitoring sites that are no longer active, or that where never reported under WFD).

In the 1st RBMP reporting cycle, a structure was set for the identifiers. The 2010 European codes should start with the ISO 3166-1 alpha-2 country code, immediately followed by the national code with a maximum of 22 characters. The following characters were allowed:

> *• The local identifier shall only use the following set of characters: {"A"…"Z", "a"…"z", "0"…"9", "_", ".", "-", ","}, i.e. only letters from the Latin alphabet, digits, underscore, point, comma, and dash are allowed;*
> *• The identifier should contain no spaces;*
> *• Alphabetical characters should always be in UPPER CASE;*
> *• Special characters must be avoided, such as '$', '!', '&', 'ë', 'á', etc;*
>
> [Source: Guidance on reporting of spatial data for the WFD (RBMP). Version 3.0 December 21 2009, Section 7.3.1, page 35.]

The specification has changed in the current reporting. The identifiers must:

- Start with the ISO 3166-1 alpha-2 country code, **except for Greece ('EL') and the United Kingdom ('UK')**;
- Be followed by the national code, with a maximum of **40 characters**;
- Use only **upper case letters** [A to Z] and **digits** [0 to 9].
  The **underscore** character ('**_**') or the **hyphen** character ('**-**') may be used as separators within the code (but not to separate the country code from the national code, and not in the end of the code).
  This means that the comma character ('**,**') and the period character ('**.**') can no longer be used.

The reason for this change is that each identifier will be associated with a stable URL in the WISE system (e.g. http://dd.eionet.europa.eu/vocabulary/wise/SpatialUnit/euRBDCode.ES030).

A regular expression may be used for a preliminary check the syntax of the identifiers. Adapt the following pattern to the specific country: ^[A-Z]{2}[0-9A-Z]{1}([0-9A-Z_-]{0,38}[0-9A-Z]{1}){0,1}$

Using thematic identifiers to relate two objects with different types

In WISE, the thematic identifiers are also used to link objects of different types.
Figure 29 and provide an overview of the existing associations.

Figure 29. Overview of the relationships between different WISE spatial object types.

Table 18. Description of the relationships between different WISE spatial object types.

Source Spatial Object Type	Association	Definition	Target Spatial Object Type
MonitoringSite	featureOfInterest	Identifies the water body being monitored.	SurfaceWaterBody GroundWaterBody
SurfaceWaterBody	relatedZone	Identifies the sub-unit that the surface water body belongs to.	SubUnit
GroundWaterBody	relatedZone	Identifies the river basin district that the groundwater body belongs to.	RiverBasinDistrict
SubUnit	relatedZone	Identifies the river basin district that the sub-unit belongs to.	RiverBasinDistrict

Note that all these associations are implemented using thematic identifiers, which always requires the pair identifier and identifier scheme (for example, relatedZoneIdentifier and relatedZoneIdentifierScheme encode the association relatedZone).

The identifier scheme used for the source spatial object must be consistent with identifier scheme used for the target object. Table 19 lists the valid combinations in the WISE spatial data sets.

Table 19. Using consistent identifier schemes to relate different WISE objects.

Source object		Target object		Validity constraints
Object Type	Identifier Scheme	Object Type	Identifier Scheme	
MonitoringSite	'euMonitoringSiteCode'	SurfaceWaterBody	'euSurfaceWaterBodyCode'	2)
"	"	GroundWaterBody	'euGroundWaterBodyCode'	2)
"	'eionetMonitoringSiteCode'	SurfaceWaterBody	'euSurfaceWaterBodyCode'	3)
"	"	"	'eionetSurfaceWaterBodyCode'	1) 4)
"	"	GroundWaterBody	'euGroundWaterBodyCode'	3)
"	"	"	'eionetGroundWaterBodyCode'	1) 4)
SurfaceWaterBody	'euSurfaceWaterBodyCode'	SubUnit	'euSubUnitCode'	2)
"	'eionetSurfaceWaterBodyCode'	SubUnit	'euSubUnitCode'	4)
"	"	"	'eionetSubUnitCode'	1)
GroundWaterBody	'euGroundWaterBodyCode'	RiverBasinDistrict	'euRBDCode'	2)
"	'eionetGroundWaterBodyCode'	"	'eionetRBDCode'	1)
SubUnit	'euSubUnitCode'	RiverBasinDistrict	'euRBDCode'	2)
"	'eionetSubUnitCode'	"	'eionetRBDCode'	1)

1) Mandatory for countries not reporting under WFD.
2) Mandatory for countries reporting under WFD.
3) Valid for countries reporting under WFD.
4) Valid in exceptional cases (e.g. small non-WFD water bodies) for countries reporting under WFD.

Using thematic identifiers to relate WFD and EIONET monitoring site codes

In the MonitoringSite data set, thematic identifiers are used for one additional purpose: to identify WFD monitoring sites that are also EIONET monitoring sites.
As explained above, the monitoring sites must be identified by their WFD code if they are used in a WFD monitoring programme. Otherwise, they must be identified by their EIONET code.
If a WFD monitoring site is also an EIONET monitoring site (i.e. if historically it has been reported under the EIONET WISE SoE data flows), then the EIONET code is provided via the relatedTo association.

Table 20. Reporting the WFD and the EIONET identifier for monitoring sites.

Object Type	Identifier Scheme	Association	Object Type	Identifier Scheme
MonitoringSite	'euMonitoringSiteCode'	relatedTo	MonitoringSite	'eionetMonitoringSiteCode'

Using INSPIRE identifiers

The INSPIRE data models use a base type named **Identifier** to uniquely identify spatial objects.
Note that a spatial object is a representation of a real-world object: so the representation may change (e.g. the geometry may be corrected), even if the real-world object remains the same.

The INSPIRE inspireId data element has a complex data type: Identifier.

Figure 30. INSPIRE Identifier data type (informative only).

In the WISE spatial data sets, it must be provided using 3 separate data elements:

- inspireIdLocalId;
- inspireIdNamespace and
- inspireIdVersionId.

In theory, the INSPIRE identifier might have been used exclusively (i.e. instead of using additional thematic identifiers). In practice, this would have been problematic:

- Implementation of the INSPIRE directive is only mandatory for EU Member States. Non-EU Data Providers might not have the possibility of providing the mandatory information (i.e. localId and namespace).
- Implementation of the INSPIRE directive is phased. For Annex III themes, newly collected and extensively restructured spatial data sets shall be conformant to the INSPIRE implementing rules on interoperability of spatial data sets and services by 2015-10-21 and for all data sets by 2020-10-21. This includes *Environmental Monitoring Facilities* (applicable to monitoring sites) and *Area Management/Restriction/Regulation Zones and Reporting Units* (applicable to river basin districts and sub-units, surface and groundwater bodies, and protected areas). The current implementation status quo is variable among EU Member States, so it is not possible to assume that all might be able to provide INSPIRE persistent unique identifiers.
- Specifically in the case of the *Area Management/Restriction/Regulation Zones and Reporting Units* theme, the INSPIRE technical guidelines recommend that the European codes defined for the WFD reporting should be used as the localId in the corresponding INSPIRE data sets and services. However this is only a recommendation. So a thematic identifier is needed to guarantee that the spatial objects can be linked to the thematic information reported under WFD or WISE SoE.
- Specifically in the case of the *Environmental Monitoring Facilities* - which covers the WFD and EIONET monitoring sites but is a rather abstract data model - two additional problems exist: there is no recommendation with regard to the use of European codes in the localID component of the identifier; and the technical guidelines do not explicitly include a thematic identifier to allow a link to previously reported thematic data. To maintain consistency with the remaining themes, a decision was taken to use thematic identifiers also in the MonitoringSite data model.

Finally, a conceptual difference exists between the thematic identifier and the INSPIRE identifier. The thematic identifier identifies a real-world object, while the INSPIRE identifier identifies the spatial object that represents it in a data set.
For many purposes, this distinction is irrelevant. However, it is important when the temporal aspects of life-cycle information need to be registered both at spatial object level and at real-world object level.

As a result of the issues described above, a number of modelling decisions was taken and the following recommendations are given:

- The inspireIdLocalId data element is mandatory. Data Providers implementing the INSPIRE directive must provide the INSPIRE localId value using this element. Data Providers not implementing the INSPIRE directive should provide the national persistent unique identifier of the spatial object: the uniqueness constraint applies to all objects of the same type reported by the country.
- The inspireIdNamespace data element is marked as optional, as requested by some Data Providers. Data Providers implementing the INSPIRE directive are requested to provide the INSPIRE namespace using this element, if already available. Data Providers not implementing the INSPIRE directive are recommended to adopt a similar approach and referred to the document "Designing URI Sets for Location" for informative purposes.
- The inspireIdVersionId element is optional. It is recommended that Data Providers report the version of the spatial object.

Relationship between inspireId and thematicId

The following text was extracted from the INSPIRE Annex III Area Management/Restriction/Regulation Zones and Reporting Units Data Specification:

> *Many ManagementRestrictionOrRegulationZone spatial objects have been assigned multiple identifiers based on different identifier schemes that have been defined for data exchange for specific requirements (e.g. national versus European reporting. Thematic identifiers have been and shall continue to be the key used to link non-spatial data to the ManagementRestrictionOrRegulationZone spatial object. To ensure that none of these identifiers and links are lost, a thematicId has been added to the ManagementRestrictionOrRegulationZone.*
>
> *The key difference between the inspireId and thematicId is that the inspireId shall be a persistent, unique identifier that can be used in external datasets to reference to the spatial object by any third party. Whereas the thematicID is a descriptive unique object identifier assigned to the spatial object defined in an information community.*
>
> *NOTE: A thematic identifier may form part of the inspireId.*
>
> *Some ManagementRestrictionOrRegulationZone spatial objects may be assigned more than one thematic identifier. These thematic identifiers may have been assigned to meet internal data maintenance requirements or are identification codes assigned at national, European or International level.*

Special case: Using hydrographic identifiers

Hydrographic identifiers are only used in the SurfaceWaterBodyCentreline data set, relating hydrographic centreline segments to surface water bodies.

Hydrographic centrelines are part of the INSPIRE HY theme (Annex I - Hydrography) specification, under the Hydro - Network application schema. The Network application schema presents a network view of hydrographic elements, with real-world features modelled as links (WatercourseLink) and nodes (HydroNode).

The INSPIRE HY theme does not include thematic identifiers (because Annex I data specifications were developed before thematic identifiers were introduced as a base data type in the Annex II and Annex III data specifications).
However, all hydrographic objects in the INSPIRE HY theme have a hydroId element with a similar meaning. The INSPIRE hydroId has a complex data type called HydroIdentifier.

Figure 31. INSPIRE HydroIdentifier data type (informative only).

For WISE reporting purposes, this hydrographic identifier will be treated as a thematic identifier:

- The classificationScheme is not required.
- The HydroIdentifier localId is a unique identifier in the scope of the corresponding namespace - so in practice it is equivalent to the ThematicIdentifier identifier.
- Similarly, the HydroIdentifier namespace is equivalent to the ThematicIdentifier IdentifierScheme in the remaining themes (i.e. it identifies the national or international identifier scheme from which the hydrographic identifier was obtained).

Further information is provided on the section “Reporting surface water body centrelines”.

Using identifiers in the WISE spatial data reporting

In the examples in this sections, two hypothetical countries are used:

- XZ, a country reporting under WFD and WISE SoE;
- ZZ, a country reporting only under WISE SoE.

Reporting the identifier for spatial objects

Monitoring sites

Monitoring sites include:

- WFD monitoring sites, i.e. monitoring sites included in any of the WFD monitoring programmes (including specific programmes and monitoring sites observed under other EU Directives, such as the Drinking Water Directive, the Bathing Waters Directive or the Urban Waste Water Treatment Directive);
- EIONET monitoring sites, which include any monitoring site for which time series have been reported under any EIONET WISE SoE data flow.

For countries reporting under WFD, most EIONET monitoring sites are also WFD monitoring sites.
In this case, the WFD monitoring site code is always the preferred identifier. The EIONET identifier must be reported in the relatedTo elements (see Figure 32).
In exceptional cases (e.g. monitoring sites in water bodies not delineated as WFD water bodies, historical monitoring sites no longer operational, etc.), an EIONET monitoring site may exist that was not reported under WFD.

For countries not reporting under the WFD, the EIONET identifier must be used.

Figure 32. Reporting the identifier of monitoring sites.

Monitoring sites in country XZ

thematicID Identifier	thematicID IdentifierScheme	relatedTo Identifier	relatedTo IdentifierScheme
XZ1	euMonitoringSiteCode	-	-
XZ2	euMonitoringSiteCode	-	-
XZ3	euMonitoringSiteCode	XZeionetCodeForSite3	eionetMonitoringSiteCode
XZ4	euMonitoringSiteCode	XZeionetCodeForSite4	eionetMonitoringSiteCode
XZ5	eionetMonitoringSiteCode	-	-
XZ6	eionetMonitoringSiteCode	-	-

Monitoring sites in country ZZ

thematicID Identifier	thematicID IdentifierScheme	relatedTo Identifier	relatedTo IdentifierScheme
ZZ3	eionetMonitoringSiteCode	-	-
ZZ4	eionetMonitoringSiteCode	-	-
ZZ5	eionetMonitoringSiteCode	-	-
ZZ6	eionetMonitoringSiteCode	-	-

Groundwater bodies

The same principle described above applies to groundwater bodies: the WFD groundwater body code will be used as a preferred identifier, where applicable. Figure 33 illustrates the reporting of the identifiers for a hypothetical set of water bodies.

Figure 33. Reporting the identifier of groundwater bodies.

thematicID Identifier	thematicID IdentifierScheme
XZ1	euGroundWaterBodyCode
XZ2	euGroundWaterBodyCode
XZ3	euGroundWaterBodyCode
XZ4	euGroundWaterBodyCode
XZ5	eionetGroundWaterBodyCode

thematicID Identifier	thematicID IdentifierScheme
ZZ3	eionetGroundWaterBodyCode
ZZ4	eionetGroundWaterBodyCode
ZZ5	eionetGroundWaterBodyCode

From a thematic point of view, some situations should occur only in exceptional circumstances:

- Data Providers reporting under WFD must report all WFD groundwater bodies – so, in principle, groundwater bodies XZ5 and XZ6 would typically be smaller aquifers, not delineated as WFD groundwater bodies[1].
- To allow European-wide assessments, Data Providers not reporting under WFD are requested to provide a comparable coverage of their national groundwater bodies – so, in principle, groundwater bodies ZZ1 and ZZ2 (and their monitoring sites and time series) should also be reported under the EIONET WISE SoE data flows.

Note that the thematic identifier of a monitoring site must be unique, i.e. a groundwater monitoring site and a surface water monitoring site must not have identical identifiers.

Surface water bodies

The principle described for groundwater bodies is also applicable to surface water bodies: the WFD surface water body code will be used as a preferred identifier; the EIONET identifier shall be used in exceptional cases, e.g. for small lakes that are not WFD water bodies.
Please refer to the section “Special case: reporting surface water bodies under WISE SoE”.

Note that the thematic identifier of a monitoring site must be unique, i.e. a groundwater monitoring site and a surface water monitoring site must not have identical identifiers.

River basin districts and sub-units

For Data Providers reporting under WFD, this information will be provided under the WFD data flow.
Data Providers not reporting under WFD are requested to provide their national delineation of river basins or sub-basins, consistent with the one used for reporting purposes under WISE SoE.

The same principle illustrated in Figure 1 (cf. page 4) applies to the reporting of sub-units (sub basins). For sub-units, the correct thematicIdIdentifierScheme is:

- 'euSubUnitCode' for WFD subunits and
- 'eionetSubUnitCode' for sub-basins reported by Data Providers not reporting under WFD.

Refer to the section “Special case: reporting river basins under WISE SoE” for further information.

[1] Generically, WFD groundwater body should be delineated in aquifers that can be used for drinking water abstraction (at least 10 m3/d as an average, or 50 persons) or support the ecological quality of a surface water body or groundwater dependent terrestrial ecosystem.

Linking spatial objects

Linking a monitoring site to a water body

Each monitoring site needs to be linked to the water body being monitored i.e. the sampled feature or "feature of interest". The two featureOfInterest elements are used for this purpose.

Figure 13 (cf. page 19) illustrates the reporting of WFD and EIONET monitoring sites, and their relationship to WFD or EIONET surface water bodies. If a WFD identifier exists, it will always be the preferred identifier.

The same principle applies to monitoring sites related to groundwater bodies. The only difference is that the identifier scheme changes for monitoring sires in groundwater bodies:

- 'euGroundWaterBodyCode' must be used instead of 'euSurfaceWaterBodyCode'; and
- 'eionetGroundWaterBodyCode' must be used instead of 'eionetSurfaceWaterBodyCode'.

Linking a sub-unit to a river basin district

Under WFD, river basin districts can be subdivided in sub-units.
By convention, if a river basin district is not subdivided, it is treated as having only one sub-unit spatially equal to the river basin district itself. This creates a hierarchical relationship similar to the one between NUTS1 and NUTS2 (statistical units).

Figure 34 illustrates a hypothetical River Basin District divided in 3 sub-units, and how to report the relationship between each sub-unit and the corresponding RBD.

Figure 34. Linking sub-units to River Basin Districts using the relatedZone elements.

Country XZ

thematicID Identifier	thematicID IdentifierScheme	relatedZone Identifier	relatedZone IdentifierScheme
XZRBD1S1	euSubUnitCode	XZRBD1	euRBDCode
XZRBD1S2	euSubUnitCode	XZRBD1	euRBDCode
XZRBD1S3	euSubUnitCode	XZRBD1	euRBDCode

Country ZZ

thematicID Identifier	thematicID IdentifierScheme	relatedZone Identifier	relatedZone IdentifierScheme
ZZRBD1S1	eionetSubUnitCode	ZZRBD1	eionetRBDCode
ZZRBD1S2	eionetSubUnitCode	ZZRBD1	eionetRBDCode
ZZRBD1S3	eionetSubUnitCode	ZZRBD1	eionetRBDCode

Data Providers not reporting under WFD (for example, non EU countries) must follow the same approach. Note that the correct identifier schemes are 'eionetSubUnitCode' (instead of 'euSubUnitCode') and 'eionetRBDCode' (instead of 'euRBDCode').

Data providers not reporting under WFD are requested to provide the spatial data pertaining river basins and river basin sub-units. Otherwise, the analysis and publication of the country's thematic data at European level may be impaired. RBD should be interpreted as reporting units (e.g. a main river basin or a set of contiguous river basins) and the same applies to sub-units (typically the basin of a tributary, a set of small contiguous coastal watersheds, etc.). The aggregated information reported under WISE SoE Water Quantity or WISE SoE Emissions need to refer to a valid RBD or sub-unit.

Linking a groundwater bodies to a river basin district

Following the principle established in the WFD reporting, each groundwater body must be related to one and only one River Basin District.
Data providers not reporting under WFD must follow the same principle, using the appropriate identifier schemes: 'eionetGroundaterBodyCode' (instead of 'euGroundwaterCode') and 'eionetRBDCode' (instead of 'euRBDCode').
Figure 35 provides an example. Groundwater XZB illustrates a special case: if the river basin district delineation follows the surface watershed divides, a groundwater polygon (i.e. the horizontal projection of the groundwater) may extent “beyond” the watershed. In this case, the groundwater body should be assigned to the adequate river basin district (based on the groundwater recharge).

Figure 35. Linking groundwater bodies to river districts using the relatedZone elements.

thematicID Identifier	thematicID IdentifierScheme	relatedZone Identifier	relatedZone IdentifierScheme
XZA	euGroundWaterBodyCode	XZRBD1	euRBDCode
XZB	euGroundWaterBodyCode	XZRBD1	euRBDCode

Linking surface water bodies to sub-units

Each surface water body is related to one and only one subunit. The principle described for groundwater bodies is applicable (with the necessary adaptations). Figure 36 illustrates an exceptional case where two small water bodies (XZc and XZd) are not WFD surface water bodies.

Figure 36. Linking surface water bodies to sub-units using the relatedZone elements.

thematicID Identifier	thematicID IdentifierScheme	relatedZone Identifier	relatedZone IdentifierScheme
XZA	euSurfaceWaterBodyCode	XZRBD1S3	euSubUnitCode
XZB	euSurfaceWaterBodyCode	XZRBD1S2	euSubUnitCode
XZC	eionetSurfaceWaterBodyCode	XZRBD2S1	euSubUnitCode
XZD	eionetSurfaceWaterBodyCode	XZRBD2S1	euSubUnitCode

Life-cycle management

Overview

The requirements for life-cycle information in the WISE spatial data sets are stated in the following excerpt of the CIS Guidance Document No 22 (section 4.4.5):

> *"Member States are responsible for the unique identification of spatial objects reported to WISE and to guarantee persistence over time.* […] *However two major problems arise on implementing these rules:*
> - *Objects in the real world change over time. For example a monitoring station is removed from a network, River Basin Districts are restructured (due to changes in administrative boundaries), etc.* […]
> - *As the objects are changing over time this also means that* […] *references to other datasets may become obsolete.*
>
> *Member States will be responsible for:*
> - *Maintaining the references between national data submitted to WISE as required by the respective reporting guidelines and described in the WISE data model (e.g. sensitive areas reported under UWWTD linked to water bodies reported under WFD);*
> - *Referencing their spatial objects to the respective objects of the WISE Reference GIS datasets and maintaining these references;*
> - *Maintaining correct linkages between datasets where objects have changed or new objects have been created, and updating all related datasets accordingly (e.g. if a new river water body dataset is submitted, the river monitoring stations also have to be updated because the stations are linked to river water bodies)."*

This section provides an overview on issues related to life-cycle management for the spatial objects in the different WISE spatial data sets, namely:

- How to report if a WFD water body was re-delineated since it was reported in the first RBMP in 2010.
- How to report if the identifier (the code) of a WFD surface water body was changed, without any other relevant change to the surface water body itself.
- How to report if the identifier (the code) of a monitoring site has changed.
- How to report if a monitoring site has been superseded by another monitoring site (implicitly meaning that the time series of the two sites are representative of the same conditions in the monitored water body).

It also provides practical information and examples on:

- How to use the beginLifeSpanVersion, endLifeSpanVerison and versionId to report changes to a spatial object representation;
- How to use the operationalActivityPeriodBegin and operationalActivityPeriodEnd to report the "validity period" of a monitoring site;
- How to use the designationPeriodBegin and designationPeriodEnd to report "validity period" of water bodies, river basin districts or protected areas;
- How to report predecessors and successors to guarantee the comparability and continuity of the data when changes occur; and
- How to report the type of change using the wiseEvolutionType element.

Please read the section on "Identifier management" for information on the proper use of thematic identifiers to uniquely identify spatial objects in WISE.
This section builds extensively on the concepts and examples in Annex F on the INSPIRE SU theme (Annex III - Statistical Units) data specification.

Life-cycle information

Life-cycle management has different complementary aspects:

- To keep track of the status of real-world entities;
- To keep track of the status of their representation, as objects in a data set;
- To keep track of their longitudinal succession in time.

The life-cycle of each real-world entity is registered using the following elements:

- For monitoring sites:
  - operationalActivityPeriodBegin;
  - operationalActivityPeriodEnd.
- For water bodies, sub-units, river basin districts and protected areas:
  - designationPeriodBegin;
  - designationPeriodEnd.

The life-cycle of each spatial object in the data set is registered using the following elements:

- beginLifeSpanVersion;
- endLifeSpanVersion;
- versionId (if the Data Provider chooses to report it explicitly as recommended).

This set of elements allows the creation of snapshots, i.e. data sets that include the spatial objects representing the real-world entities that are valid at a given moment in time.

However, tracking their succession in time requires two additional elements: predecessors and successors. Using these elements, an explicit log can be kept of any longitudinal changes in the data sets. (Note that for monitoring sites, the equivalent elements are supersedes and supersededBy.)

One final element is used: wiseEvolutionType. It registers the type event that generated the object.

Figure 37. Valid options for the wiseEvolutionType element.

Creation

If a new spatial object is to be created in the WISE spatial reference data sets (e.g. a new WFD water body not reported in the 1st RBMPs), then:

- The **wiseEvolutionType** element must have the value 'creation';
- The **beginLifespanVersion** element must be filled with a valid date;
- It is strongly recommended to provide a **versionId**: this element is relevant when there are future changes to the object (e.g. minor changes in the geometry, or corrections/updates to other information that does not change the identity of the object itself).

For monitoring sites, the **operationalPeriodBegin** element must be provided, with a valid DateTime value. For other spatial objects – water bodies, sub-units, RBDs, protected areas – the **designationPeriodBegin** element must be provided, with a valid DateTime value.

The following rules apply:

- If the new object does not replace an existing object, then it will have no predecessors.
- If the new object replaces any existing object(s), then it will have 1 (or more) predecessors.
- If object A identifies object B as a predecessor, then object B must identify object A as a successor.

Typically, a new object is not supposed to have successors (i.e. it is supposed to be valid and operational). However, exceptional situations may require the reporting of a previous unreported object that is no longer operational. If the object was never reported and its identifier is not listed in the WISE register, the recommended procedure is to use the following two steps:

- Provide the previously unreported object, using wiseEvolutionType ='creation'.
- Provide an update to that object, using wiseEvolutionType ='deletion' and specifying its successors.

The following exclusions apply:

- If the object was already reported (but not its geometry) and has <u>not</u> been replaced, then use the option 'noChange'. This option must be used for the WFD water bodies that haven't changed from the 1st to 2nd RBPM, but that were not previously reported in the spatial data sets.
- If the object was already reported (but not its geometry) and has been replaced, then use the option 'delete'. This option must be used for the WFD water bodies from the 1st RBPM that were not previously reported in the spatial data sets, and that are no longer in use for the 2nd RBPM. If the object was replaced, then one or more successors should be identified.
- If the new object is created from an existing object via a splitting operation, then use the option 'splitting'. One and only one predecessor must be identified.
- If the new object is created from existing objects via an aggregation operation, then use the option 'aggregation'. Two (or more) predecessors must be identified.
- If the new object is created from existing objects via a hybrid operation involving both aggregation and splitting, then use the option 'changeBothAggregationAndSplitting'. Two (or more) predecessors must be identified.
- If the object modifies an existing object then use the relevant **wiseEvolutionType** value: 'changeExtendedArea', 'changeExtendedDepth', 'changeExtendedAreaAndDepth', 'changeReducedArea', 'changeReducedDepth', 'changeReducedAreaAndDepth'. Note that the identifier of the object may remain the same (if it is not considered a "new" object): however, it is always a new version of the object, so the beginLifespanVersion and versionId elements must be provided accordingly. See further information under the section "Changes in the spatial extent".
- If there has been a change in the code used at national level, use the option 'changeCode', and report the previous code in the *predecessors* elements (or the *supersedes* elements, if it is a monitoring site).

Aggregation

If a new spatial object results from the aggregation of previously reported spatial objects (e.g. a new WFD water body resulting from the aggregation of two water bodies reported in the 1st RBMPs), then:

- The **wiseEvolutionType** element must have the value 'aggregation'.
- The **beginLifespanVersion** element must be filled with a valid DateTime.
- It is strongly recommended to provide a **versionId**: this element is relevant when there are future changes to the object (e.g. minor changes in the geometry, or corrections/updates to other information that does not change the identity of the object itself).

Note that aggregation is applicable to real-world surfaces – which are usually represented by polygons. However, the cartographic representation may also be a polyline or even a (representative) point. So, the aggregation operation can also be reported for polyline and point data sets.

For monitoring sites, the **operationalPeriodBegin** element must be provided, with a valid DateTime value. For other spatial objects – water bodies, sub-units, RBDs, protected areas – the **designationPeriodBegin** element must be provided, with a valid DateTime value.

Two (or more) predecessors must be reported.

- If object A identifies object B as a predecessor, then object B must identify object A as a successor.

The following constraints are applicable (and used to control the validity of the reported data):

- The new objects must not reuse the thematic identifier of any replaced object.
- Aggregation of monitoring sites is valid if all are located within the same water body.
- Aggregation of surface bodies is valid if the resulting water body is located in the same sub-unit. (If the geometry of the original water bodies is available, additional checks are performed).
- Aggregation of groundwater bodies is valid if the resulting water body are located in the same river basin district.

(If the geometry of the original waterbodies is available, additional checks are performed.)

Splitting

If a new spatial object results from the splitting of a previously reported spatial object (e.g. a new WFD water body resulting from the splitting of a water body reported in the first RBMPs), then:

- The **wiseEvolutionType** element must have the value 'splitting'.
- The **beginLifespanVersion** element must be filled with a valid DateTime.
- It is strongly recommended to provide a **versionId**: this element is relevant when there are future changes to the object (e.g. minor changes in the geometry, or corrections/updates to other information that does not change the identity of the object itself).

Note that splitting is applicable to real-world surfaces – which are usually represented by polygons. However, the cartographic representation may also be a polyline or even a (representative) point. So, the splitting operation can also be reported for polyline and point data sets.

For monitoring sites, the **operationalPeriodBegin** element must be provided, with a valid DateTime value. For other spatial objects – water bodies, sub-units, RBDs, protected areas – the **designationPeriodBegin** element must be provided, with a valid DateTime value.

One predecessor must be reported.

- If object A identifies object B as a predecessor, then object B must identify object A as a successor.

The following constraints are applicable (and used to control the validity of the reported data):

- The new objects must not reuse the thematic identifier of any replaced object.
- Splitting of monitoring sites is valid if all are located in the same water body.
- Splitting of a surface body is valid if the resulting water bodies are spatially adjacent and all are located in the same sub-unit.
- Splitting of a groundwater body is valid if the resulting water bodies are spatially adjacent and all are located in the same river basin district.

(If the geometry of the original waterbodies is available, additional checks are performed.)

Combined aggregation and splitting

If a new spatial object results from a complex operation involving both the splitting and aggregation of previously reported spatial objects, then:

- The **wiseEvolutionType** element must have the value 'changeBothAggregationAndSplitting'.
- The **beginLifespanVersion** element must be filled with a valid DateTime.
- It is strongly recommended to provide a **versionId**: this element is relevant when there are future changes to the object (e.g. minor changes in the geometry, or corrections/updates to other information that does not change the identity of the object itself).

For monitoring sites, the **operationalPeriodBegin** element must be provided, with a valid DateTime value. For other spatial objects – water bodies, sub-units, RBDs, protected areas – the **designationPeriodBegin** element must be provided, with a valid DateTime value.

Two or more predecessors must be reported.

- If object A identifies object B as a predecessor, then object B must identify object A as a successor.

The constraints in the sections on “Aggregation” and “Splitting” are applicable in this case.

Changes in the spatial extent

If the spatial object results from changes to spatial extent of a previously existing object (typically a water body or a protected area), then:

- The **wiseEvolutionType** value must have the relevant value for the specific situation been reported: 'changeExtendedArea', 'changeReducedArea', 'changeExtendedDepth', 'changeExtendedAreaAndDepth', 'changeReducedDepth', 'changeReducedAreaAndDepth'.
- The options involving changes in the depth are applicable only to groundwater bodies.
- The **beginLifespanVersion** element must be filled with a valid DateTime.
- It is strongly recommended to provide a **versionId**: this element is relevant when there are future changes to the object (e.g. minor changes in the geometry, or corrections/updates to other information that does not change the identity of the object itself).

For monitoring sites, the **operationalPeriodBegin** element must be provided, with a valid DateTime value. For other spatial objects – water bodies, sub-units, RBDs, protected areas – the **designationPeriodBegin** element must be provided, with a valid DateTime value.

With regard to identifiers, two options are possible (depending on the degree of change and on the approach taken by the different national Data Providers):

- The identifier of the object remains the same (if it is not considered a “new” object): however, it is always a new version of the object, so the **beginLifespanVersion** and **versionId** elements must be provided.
- Or, the changed object is treated as new object, with a new unique thematic identifier: then the original object must be listed as a **predecessor**.

Data providers are strongly recommended to follow the second approach (i.e. treat the changed object as a new object, with a new unique identifier).

Changes in the identifier of an object

In special cases, the identifiers used at national level may change although the real-world entities have not changed. Since the European identifiers are derived from the national identifiers (by concatenating the 2-letter country code as a suffix to the national code), this change needs to be propagated to the WISE spatial data sets.

Conceptually, if the identifier changes, then the object is no longer the same as before, and it replaces the one with the old identifier.

- The **wiseEvolutionType** element must have the value 'changeCode';
- The **beginLifespanVersion** element must be filled with a valid DateTime;
- It is strongly recommended to provide a **versionId**: this element is relevant when there are future changes in the object (e.g. minor changes in the geometry, or corrections/updates to other information that does not change the identity of the object itself).

For monitoring sites, the **operationalPeriodBegin** element must be provided, with a valid DateTime value. For other spatial objects – water bodies, sub-units, RBDs, protected areas – the **designationPeriodBegin** element must be provided, with a valid DateTime value.

One predecessor must be identified: the object bearing the old identifier.

Changes in the geometry

Some changes do not affect the identity of a previously reported object, but create a new version of an existing object. For example, if the location of a monitoring site can be reported with better accuracy or precision than previously reported. Or if the delineation of a water body has changed only because a new survey is available with better geometric accuracy or precision.

If an update is provided to the geometry of a previously reported object, then:

- The **wiseEvolutionType** element must have the value 'change';
- The **beginLifespanVersion** element must be filled with a valid DateTime;
- The **versionId** element needs to be updated with regard to the value in the original version of the object.

Note also that the original version of the object will be updated (specifically the endLifeSpanVersion value) in the European dataset (there is no need to report that version again).

Note that the object is the same: it’s just a newer version. Note also that the concept of successors and predecessors is applicable at object level, not at version level. So, if the old version of the object had predecessors (and/or successors), then the new version of the object maintains the same predecessors (and/or successors).

No changes

In other situations, the update does not create a new version of an existing object.
For example, missing information may be available that was not previously reported.

In these situations:

- The **wiseEvolutionType** element must have the value 'noChange'.

The remaining values may change as appropriate.

Note that this option must be used for the WFD water bodies that haven't changed from the 1st to 2nd RBPM, but that were not previously reported in the spatial data sets.

Deletion

If a WFD spatial object was reported in the 2010 reporting exercise and is not reported in the 2016 reporting exercise because it no longer exists (as opposed to the cases in which it was aggregated or split into new objects), then the object should be reported as 'deleted'. This is to avoid problems of interpretation (if the object is not reported, this could be due to the object not existing but also to an involuntary omission).

If a previously reported spatial object will no longer be valid, then:

- The **wiseEvolutionType** element must have the value 'deletion';
- The **endLifespanVersion** element must be filled with a valid DateTime.

Note the **endLifespanVersion** value must be posterior to the **beginLifespanVersion** value.

If a monitoring site will no longer be reported because it is no longer active or monitored in the real world, the **operationalPeriodEnd** element must be provided, with a valid DateTime value.
Note the **operationalPeriodEnd** value must be posterior to the **operationalPeriodBegin** value.

For other spatial objects – water bodies, sub-units, RBDs, protected areas – the **designationPeriodEnd** element must be provided, with a valid DateTime value.
Note the **designationPeriodEnd** value must be posterior to the **designationPeriodBegin** value.

The following principles apply:

- If the object will not be replaced, then it has no successors.
  (Note that, for monitoring sites, this will break the time series of reported data.)
- If other objects will replace it, then 1 (or more) successors <u>must</u> be identified.
  (A comma-separated list of their identifiers must be provided as the value of the element.)
  (Note that, for monitoring sites, the time series data previously reported for the deleted site will be considered representative of the conditions at the "new" site, i.e. the time series will be merged.)
- If object A identifies object B as a predecessor, then object B must identify object A as a successor.

For monitoring sites, successors must be reported using the supersededBy elements.
For other spatial object, successors must be reported using the successors elements.

Special case: constraints and quality control

Spatial objects marked for 'deletion' are excluded from the quality control procedures applicable to the remaining "valid" objects in the data set.

Special case: invalid objects

Invalid objects are objects reported by mistake. There will be no automated mechanism to purge invalid objects – as this is considered an exceptional situation that shall require human intervention and oversight.

Please contact helpdesk (wfd.helpdesk@eionet.europa.eu or wisesoe.helpdesk@eionet.europa.eu, depending on the reporting obligation).

Quick reference card

INSPIRE theme	INSPIRE element	#	WISE GML data element	RiverBasinDistrict	SubUnit	SurfaceWaterBody	SurfaceWaterBodyLine	GroundWaterBody	MonitoringSite	ProtectedArea	ProtectedAreaLine	ProtectedAreaPoint	GroundWaterBodyHorizon	SurfaceWaterBodyCentreline	Shapefile field name
AM | EF	geometry	1	geometry	1	1	1	1	1	1	1	1	1	1	1	shape
AM | EF	inspireId	2	inspireIdLocalId	1	1	1	1	1	1	1	1	1			localId
		3	inspireIdNamespace	1	1	1	1	1	1	1	1	1			namespace
		4	inspireIdVersionId	1	1	1	1	1	1	1	1	1			versionId
AM	thematicId	5	thematicIdIdentifier	1	1	1	1	1	1	1	1	1	1	1	thematicId
		6	thematicIdIdentifierScheme	1	1	1	1	1	1	1	1	1	1	1	themaIdSch
(from HY)	hydroId	7	hydroIdLocalId											1	hydroId
		8	hydroIdNamespace											1	namespace
AM | EF	beginLifespanVersion	9	beginLifespanVersion	1	1	1	1	1	1	1	1	1			beginLife
AM | EF	endLifespanVersion	10	endLifespanVersion	1	1	1	1	1	1	1	1	1			endLife
(concept from SU)	predecessors	11	predecessorsIdentifier	1	1	1	1	1		1	1	1			predecesId
		12	predecessorsIdentifierScheme	1	1	1	1	1		1	1	1			predeIdSch
(concept from SU)	sucessors	13	successorsIdentifier	1	1	1	1	1		1	1	1			successoId
		14	successorsIdentifierScheme	1	1	1	1	1		1	1	1			succeIdSch
EF	supersedes	15	supersedesIdentifier						1						predecesId
		16	supersedesIdentifierScheme						1						predeIdSch
EF	supersededBy	17	supersededByIdentifier						1						successoId
		18	supersededByIdentifierScheme						1						succeIdSch
(concept from SU)	evolutions	19	wiseEvolutionType	1	1	1	1	1	1	1	1	1			wEvolution
AM | EF	name	20	nameTextInternational	1	1	1	1	1	1	1	1	1			nameTxtInt
		21	nameText	1	1	1	1	1	1	1	1	1			nameText
		22	nameLanguage	1	1	1	1	1	1	1	1	1			nameTxtLan
from HY	geographicalName	23	geographicalNameText											1	geonameTxt
		24	geographicalNameLanguage											1	geonamTxtL
AM	designationPeriod	25	designationPeriodBegin	1	1	1	1	1		1	1	1			desigBegin
		26	designationPeriodEnd	1	1	1	1	1		1	1	1			desigEnd
EF	operationalActivity	27	operationalActivityPeriodBegin						1						opActBegin
		28	operationalActivityPeriodEnd						1						opActEnd
AM	zoneType	29	zoneType	1	1	1	1	1		1	1	1			zoneType
AM	specialisedZoneType	30	specialisedZoneType		1	1	1	1		1	1	1			spZoneType
AM	legalBasis	31	legalBasisName							1	1	1			legisName
		32	legalBasisLink							1	1	1			legisLink
		33	legalBasisLevel							1	1	1			legisLevel
AM	relatedZone	34	relatedZoneIdentifier		1	1	1	1							rZoneId
		35	relatedZoneIdentifierScheme		1	1	1	1							rZoneIdSch
AM	relatedZone	36	relatedZoneTransboundaryIdentifier			1	1	1							rTrnsId
		37	relatedZoneTransboundaryIdentifierScheme			1	1	1							rTrnsIdSch
EF	featureOfInterest	38	featureOfInterestIdentifier						1						foiId
		39	featureOfInterestIdentifierScheme						1						foiIdSch
EF	relatedTo	40	relatedToIdentifier						1						rSiteId
		41	relatedToIdentifierScheme						1						rSiteIdSch
EF	mediaMonitored	42	mediaMonitoredBiota						1						mediaBiota
		43	mediaMonitoredWater						1						mediaWater
		44	mediaMonitoredSediment						1						mediaSedim
EF	purpose	45	purpose						1						purpose
		46	catchmentArea						1						catchArea
		47	maximumDepth						1						maxDepth
		48	confidentialityStatus						1						confStatus
		49	sizeValue			1	1	1		1	1	1			sizeValue
		50	sizeUom			1	1	1		1	1	1			sizeUoM
		51	meanDepth			1	1								meanDepth
		52	horizons					1							horizons
		53	horizon										1		horizon
		54	continua											1	continua
		55	link	1	1	1	1	1	1	1	1	1			link

Note on the WISE register

This note is provided for information only. It does not change or affect the reporting process.

> ***register***
> *set of files containing identifiers assigned to items with descriptions of the associated items [ISO 19135]*
>
> ***registry***
> *information system on which a register is maintained [ISO 19135]*
> Source: http://inspire.ec.europa.eu/documents/Data_Specifications/D2.5_v3.4.pdf

As part of the EIONET register at http://dd.eionet.europa.eu/vocabularies and to facilitate to reuse of the WISE identifiers across different data flows and reporting obligations, a register is being created for the identifiers of river basin districts, sub-units, water bodies and monitoring sites.

The vocabularies are structured according to the SKOS (Simple Knowledge Organization System) data model.

Currently, the WISE register is mainly a codelist register that contains concepts common to the WFD and the WISE SoE reporting. For example, the WFD quality elements or the WFD intercalibration types.

Registers will be maintained for the identifiers of river basin districts, sub-units, water bodies and monitoring sites. Similar registers already exist for the Natura 2000 site list or the CDDA site list,

The http://dd.eionet.europa.eu/vocabulary/wise/SpatialUnit register currently contains 3 types of spatial units: countries, river basin districts and sub-units (Figure 38).

Figure 38. SpatialUnit register.

Each concept has an URI, e.g. http://dd.eionet.europa.eu/vocabulary/wise/SpatialUnit/euRBDCode.AT1000. The link provides basic information about the spatial unit, which in this case is an Austrian river basin district (Figure 39).

Figure 39. Information about the identifier of a river basin district.

Concept URI	http://dd.eionet.europa.eu/vocabulary/wise/SpatialUnit/euRBDCode.AT1000
Preferred label	DANUBE
Definition	River basin district
Notation	AT1000
In country	AT (Austria) in common/countries
Identifier scheme	euRBDCode (euRBDCode) in wise/IdentifierScheme
Status	stable (Valid - stable) in datadictionary/status

Similarly, each subunit within AT1000 has a unique URI. For example: http://dd.eionet.europa.eu/vocabularyconcept/wise/SpatialUnit/euSubUnitCode.AT1100. Each sub-unit has an additional predicate: the related zone, i.e. the river basin it belongs to (Figure 40).

Figure 40. Information about the identifier of a river basin district sub-unit.

Concept URI	http://dd.eionet.europa.eu/vocabulary/wise/SpatialUnit/euSubUnitCode.AT1100
Preferred label	DANUBE
Definition	River basin district sub unit
Notation	AT1100
In country	AT (Austria) in common/countries
Identifier scheme	euSubUnitCode (euSubUnitCode) in wise/IdentifierScheme
Status	stable (Valid - stable) in datadictionary/status
Related zone	euRBDCode AT1000 (DANUBE) in wise/SpatialUnit

Information about the life-cycle of identifiers is also available. For example, in the 2016 WFD reporting, Ireland will report a single river basin district that replaces the river basin districts reported in the 2010 exercise (Figure 41).

Figure 41. Information about the identifier of a river basin district that replaces previously reported identifiers.

Concept URI	http://dd.eionet.europa.eu/vocabulary/wise/SpatialUnit/euRBDCode.IEROI
Preferred label	IRELAND
Definition	River basin district
Notation	IEROI
In country	IE (Ireland) in common/countries
Replaces	euRBDCode.IEEA (EASTERN) in wise/SpatialUnit euRBDCode.IEGBNISH (SHANNON) in wise/SpatialUnit euRBDCode.IESE (SOUTH EASTERN) in wise/SpatialUnit euRBDCode.IESW (SOUTH WESTERN) in wise/SpatialUnit euRBDCode.IEWE (WESTERN) in wise/SpatialUnit
Identifier scheme	euRBDCode (euRBDCode) in wise/IdentifierScheme
Status	stable (Valid - stable) in datadictionary/status

Each of the former river basin districts is kept in the register (Figure 42). Note however that the status is superseded, because the spatial unit has been replaced. The link to the new river basin district is provided.

Figure 42. Information about the identifier of a river basin district that has been replaced by a new identifier.

Concept URI	http://dd.eionet.europa.eu/vocabulary/wise/SpatialUnit/euRBDCode.IEEA
Preferred label	EASTERN
Definition	River basin district
Notation	IEEA
In country	IE (Ireland) in common/countries
Is replaced by	euRBDCode.IEROI (IRELAND) in wise/SpatialUnit
Identifier scheme	euRBDCode (euRBDCode) in wise/IdentifierScheme
Status	superseded (Deprecated - superseded) in datadictionary/status

Figure 43 illustrates a different case: EL01 replaces an “invalid.13” identifier, meaning an identifier with an invalid syntax.

Figure 43. Information about the identifier of a river basin district that replaces an invalid identifier.

Concept URI	http://dd.eionet.europa.eu/vocabulary/wise/SpatialUnit/euRBDCode.EL01
Preferred label	WESTERN PELOPONNESE
Definition	River basin district
Notation	EL01
In country	GR (Greece) in common/countries
Replaces	invalid.13 (WESTERN PELOPONNESE) in wise/SpatialUnit
Identifier scheme	euRBDCode (euRBDCode) in wise/IdentifierScheme
Status	stable (Valid - stable) in datadictionary/status

Following the link, clarifies the reason: in the previous WFD reporting the 'GR' country code was used in the beginning of the identifier (Figure 44). In the 2016 reporting, the 'EL' country code must be used in the beginning of the identifier, but the river basin district is the same. So the former identifier is simply marked as invalid and replaced by the new identifier. For the same reason, the URI to an invalid concept is not "human-readable" nor does can it be used to directly obtain the identifier.

Figure 44. Information about an 'invalid' identifier previously used for a river basin district.

Concept URI	http://dd.eionet.europa.eu/vocabulary/wise/SpatialUnit/invalid.13
Preferred label	WESTERN PELOPONNESE
Definition	River basin district
Notation	GR01
In country	GR (Greece) in common/countries
Is replaced by	euRBDCode.EL01 (WESTERN PELOPONNESE) in wise/SpatialUnit
Identifier scheme	euRBDCode (euRBDCode) in wise/IdentifierScheme
Status	invalid (Invalid) in datadictionary/status

About the status of a concept

Each concept has an associated status (Figure 45).
The different possible statuses are defined in http://dd.eionet.europa.eu/vocabulary/datadictionary/status.

The section provides an overview of the different statuses and of their use in the context of the identifiers register and of the data quality control.

Figure 45. Status.

Not accepted is an abstract status that includes:

- **Submitted -** Used for identifiers that haven't been evaluated (e.g. passed quality control). Can be seen as an internal initial state.
- **Reserved** - Used for reserved identifiers that cannot be used for real spatial units.
- **Invalid** - Used for identifiers that cannot not be used in the current reporting.

The invalid state is applied to "wrong" identifiers – e.g. identifiers that were used in the past, but that do not follow the current syntax requirements for identifiers, or identifiers that the Data Provider flagged has being wrong. Invalid spatial identifiers can be replaced by other identifiers.

Not accepted identifiers should not be used in the reporting. Depending on the requirements of each specific data flow or spatial data set, using one of this identifiers in a data delivery can trigger:

- a BLOCKER, i.e. the data cannot be delivered;
- an ERROR, i.e. the data can be delivered but a resubmission will probably be requested; or
- a WARNING, i.e. the data can be delivered but a resubmission may be requested or the data may not be publishable.

Accepted is an abstract state that includes valid and deprecated identifiers.
Valid identifiers include 'valid – **experimental**' and 'valid – **stable**' identifiers.
Deprecated identifiers include 'deprecated – **superseded**' and 'deprecated – **retired**' identifiers.

Depending on the requirements of each specific data flow or spatial data set, the data delivery may include any accepted identifier, or only valid identifiers, or only valid – stable identifiers, etc…
The default approach is that any accepted identifier can be used.

Valid – stable identifiers are syntactically correct, no issue has been detected in the spatial object previously reported by the Data Provider, and refer to an active valid real world entity (as far as the Data Requester knows).

Valid – experimental identifiers are syntactically correct identifiers that are proposed by the Data Requester (i.e. the EEA or DG ENV) to replace invalid identifiers.
These identifiers were never reported by countries. They are proposed as a replacement for an invalid identifier that was reported by in the past (e.g. an identifier that had special characters). If countries accept the change and use it in the reporting, then the identifier state will be changed to 'valid – stable', 'deprecated – superseded' or 'deprecated – retired' (depending on what is reported, see definitions below).

Valid identifiers are syntactically correct identifiers reported by the Data Provider. However issues have been detected with the spatial object itself (e.g. the name is missing and/or the geometry needs to be checked), so the identifier cannot be marked as 'valid – stable'. Valid identifiers may replace 'deprecated' identifiers or 'invalid' identifiers (the same applies to 'valid – stable' or valid – experimental identifiers).

Deprecated – superseded identifiers are syntactically correct identifiers that are known to have been replaced by another identifier (as reported by Data Providers in the normal reporting process, using the life-cycle information attributes).

Deprecated – retired identifiers are syntactically correct identifiers that are no longer used and have not been replaced (e.g. a monitoring site that is no longer operational and has not been replaced by a different one).

Deprecated identifiers are syntactically correct identifiers that were valid in the past. This status is only used when there is not enough information to know if the identifier has been superseded or retired.

(In exceptional circumstances, valid or deprecated identifiers may later be found to be invalid.)

References

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- INSPIRE Data Specification on Hydrography – Technical Guidelines. http://inspire.ec.europa.eu/documents/Data_Specifications/INSPIRE_DataSpecification_HY_v3.1.pdf
- INSPIRE Data Specification on Statistical Units – Technical Guidelines http://inspire.jrc.ec.europa.eu/documents/Data_Specifications/INSPIRE_DataSpecification_SU_v3.0.pdf
- Drafting Team "Data Specifications" – deliverable D2.6: Methodology for the development of data specifications, http://inspire.ec.europa.eu/reports/ImplementingRules/DataSpecifications/D2.6_v3.0.pdf
- INSPIRE Metadata Implementing Rules: Technical Guidelines based on EN ISO 19115 and EN ISO 19119. http://inspire.ec.europa.eu/documents/Metadata/MD_IR_and_ISO_20131029.pdf

- Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy. http://ec.europa.eu/environment/water/water-framework/index_en.html

Document **Annex 6: Reporting on the River Basin Management Plans - a user manual**

Contract **070201/2014/689488/ENV.C.1**

Development of Tools and Services for the Water Information System for Europe (WISE) and the implementation framework

Client

European Commission

Directorate-General Environment

Versioning	*Date*	*Action*	*Author*
6.0.6	September 22nd 2016	Further instructions for QA validations applied to large data files	Alberto Telletxea

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1 Introduction

These guidelines explain how to use Reportnet, the European Environment Agency's electronic infrastructure for data collection (http://www.eionet.europa.eu/menureportnet) for finding information and reporting information to the EU Commission in pursuance of the Water Framework Directive (WFD) - River Basin Management Plans - 2016 Reporting. The reporting is organised in collaboration between DG Environment and the European Environment Agency (EEA). The guidelines addresses the whole reporting process involving:

- Identifying the reporting obligation in Reportnet (http://rod.eionet.europa.eu/),
- Downloading data definitions, reporting templates and supporting documents,
- Uploading the data in Reportnet (http://cdr.eionet.europa.eu/).

2 How to find the reporting obligation in ROD

ROD is the part of Reportnet where you can find the EEA's reporting obligations database. It contains records describing environmental reporting obligations that countries have towards international organisations.

This is the direct link to access to the details of the WFD 2016 reporting obligation:

http://rod.eionet.europa.eu/obligations/715

Water Framework Directive - River Basin Management Plans - 2016 Reporting	Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy as amended by Decision 2455/2001/EC and Directives 2008/32/EC, 2008/105/EC and 2009/31/EC.	DG ENV (EC)	2016-03-22

3 How to find the data definitions, reporting templates and supporting documents

The reporting guidelines can be found in the Water Framework Directive reporting resources page (http://cdr.eionet.europa.eu/help/WFD/WFD_521_2016/):

- UML with the data specifications,
- Links to XML schemas;
- Supporting documents:
    - WFD Reporting Guidance 2016

- GIS Guidance
- Helpdesk Log

- Tools for data transformation:
  - Conversion tool from Access to XML, for the tabular data;
  - Conversion tool from Shape files to GML, for the spatial data.
- Data quality assessment tools:
  - Supporting document;
  - Within schema checks.

4 How to deliver data in CDR

Step 0: Reporting of Annex0 (if relevant)

Those Member States that are not able to report all the data as required in the WFD Reporting Guidance 2016 must upload a explanatory note (a 'Read me first' document) identifying the information the Member State is unable to report and the reasons why (see sections 1.2 and 1.6 of the WFD Reporting Guidance 2016). This explanatory note should conform to the contents of Annex 0 to the WFD Reporting Guidance 2016.

The template available Water Framework Directive reporting resources page (http://cdr.eionet.europa.eu/help/WFD/WFD_521_2016/) must be used. The template must be submitted via email to the WFD helpdesk (wfd.helpdesk@eionet.europa.eu). The subject of the email should be "*Annex 0 submission for [name of country or RBD]*". The files should be submitted at least one month in advance of reporting, in Word format and in English. This early warning is essential to allow the Commission handling the QA/QC.

The reporter of the Annex 0 will receive feedback from the Commission on the contents of the document within a week of its submission. The feedback may include advice to facilitate reporting and the QA/QC validation. Omissions that may put at risk the integrity and consistency of the dataset will not be accepted.

The data reporter will then be asked to upload in Reportnet this version of Annex 0, as commented by the Commission, together with the XML/GML datasets (see step 3 below). If the Annex 0 is filled in at national level (meaning same justifications are applicable to all RBDs), it should be reported in the Folder National RBDSUCA (see below). If the Annex 0 is filled in at RBD level it should be reported at the relevant River Basin District folder.

The name of the Annex 0 file should conform to the following file naming convention:

Annex0_CountryCode(2 characters).docx (for national Annex 0)

Annex0_CountryCode(2 characters)_EURBDCode.docx (for RBD Annex 0)

Step 1: User accounts and access permissions

In order to report, an Eionet account with user name and password is required as well as the permission to upload the national delivery (authorised Data Reporters are listed http://rod.eionet.europa.eu/contacts?roleId=extranet-wfd-data).

Please request user accounts and access permissions for the person(s) responsible for uploading the files through your National Reporting coordinators for water directives (http://rod.eionet.europa.eu/contacts?roleId=extranet-wise-nfp).

These National coordinators are registered and authorised to make the permission requests to the WFD helpdesk (wfd.helpdesk@eionet.europa.eu). The subject of the email should be "WFD2016 d*ata reporter registration request for [name of country]*". In the mail body it is mandatory to provide the following details of the data reporter to be registered:

- EIONET User ID (in case exist)
- First name
- Last name
- E-mail
- Telephone number
- Job title
- Organisation

Step 2: Enter the Central Data Repository, login to your folder and add an envelope

When preparing for the WFD2016 delivery, you first have to go to the respective WFD2016 country folder in EEA's Central Data Repository (CDR) by using your EIONET user name and password. Your country folder will follow this path:

http://cdr.eionet.europa.eu/***<your country two-digit ISO code>***/eu/wfd2016/

Once you are on your country folder:

a) Go to the specific pre-created folder/collection where you will upload your data or documents.

   See in the graph below the hierarchy of folders you will find in your country folder. In blue the pre-created folders and in green the envelopes you should create where it is allowed to report data (e.g. XMLs, GMLs) and documents (e.g.PDFs, DOCs).

   If there is only one RBD in your country you are still requested to use this structure and upload the XML files (except the RBDSUCA file) under "River Basin District 1 (name of the RBD)" folder. The RBMP, PoM and background documents can be uploaded in the folder "RBMP, PoM background documents\National".

MS Folder
(http://cdr.eionet.europa.eu/<your country>/eu/wfd2016/)
RBMP, PoM background documents (/documents)
National spatial data (/spatial)
National RBDSUCA (/rbdsuca)
River Basin District 1 (/districts/<rbd code>)
River Basin District 2 (/districts/<rbd code>)
National (/national)
River Basin District 1 (/<rbd code>)
River Basin District 2 (/<rbd code>)
Date 1
Date 2

These are the specific resources and data files that need to be reported for each reporting envelope inside the folder types depicted above. Annex 0 only needs to be included if applicable (see step 0 above). **As regards uploading of files, it is mandatory to follow the order shown below** to ensure the proper functioning of the automatic QA/QC:

b) Now add a new envelope, which will store all the data files or documents from a delivery. Add a title for the envelope based on the submission date, following this convention:

Title: ***YYYYMMDD***

Envelope description and coverage note fields are optional.

Step 3: Upload your WFD2016 data

a) Get to the folder level and open the new envelope you have created by clicking on its title.Activate the task, by clicking on the related button. Activating means that you have reserved the envelope for yourself to work on. Other users will not be able to modify it. Your new envelope is now in Draft status and files can be added.

b) Upload your data from your own system using the "add file" option in the envelope. You can always interrupt your work and continue your contribution at a later time without losing data. You can also upload your data files in a single Zip file. The zip file upload makes it possible for you to add a large number of files in one upload. The zip file will be uploaded and unwrapped.

The naming convention to be used for the files (GML and XML) is the following:

NameOfSchema(DataSetType)_CountryCode(2 characters)_YYYYMMDD.xml/gml

Where *NameOfSchema(DataSetType)* is one of the following options:

GML schema names	XML schema names
RiverBasinDistrict	RBDSUCA
GroundWaterBodyHorizon	GWB
GroundWaterBody	GWMET
MonitoringSite	SWB
ProtectedAreaLine	SWMET
ProtectedAreaPoint	Monitoring
ProtectedArea	RBMPPoM
SubUnit	
SurfaceWaterBodyCentreline	
SurfaceWaterBodyLine	
SurfaceWaterBody	

Some examples:

SWB_NL_20160322.xml

RBDSUCA_EE_20160315.xml

SurfaceWaterBodyLine_FR_20160320.gml

SubUnit_RO_20160301.gml

Note: In the Reporting guidance and in the GIS guidance is specified that the descriptive data needs to be uploaded as XML files and the spatial data as GML files. You can use the online conversion tools provided at http://cdr.eionet.europa.eu/help/WFD/WFD_521_2016 to convert from Access to XML and Shape files to GML.

For the Access to XML tool you just need to upload the Access DB as MS Access 2003 format following the structure given at the CDR reporting page.

For the Shapefile to GML you need to upload a ZIP containing the different files required (.dbf, .prj, .sbn, .sbx, .shp, .shx)

See below captures of these existing tools.

Page updated on April 26th 2016

Access2XML: Conversion tool for the WFD Access database

Use this tool to convert the **WFD Access database** to a XML file.

Note:

EEA Reportnet works best with Google Chrome (recommended) or Mozilla Firefox. **The use of Internet Explorer is not recommended.**

Instructions:

- Click the "Choose File" (or "Browse...") button to select the Access database you want to convert.
- Click the "Upload File" button to upload the Access Database (please be patient, some files may take a while to upload).
- Click the "Refresh File List" button to see the list of files (please be patient, some files may take a while to upload).
- Provide a valid e-mail address and click the "Execute" button.
- When the conversion is ready, the system will send you an e-mail, with a link to the converted file.
- You can then download the file.

Destination Microsoft Access Database File: Choose file No file chosen Upload File

In addition, please provide us a valid e-mail address. The system will deliver in your mailbox a link to the generated XMLs (zipped):

File List Refresh File List

Execute

Page updated on June 7th 2016

Shape2GML: Conversion tool for the RiverBasinDistrict shapefile

Use this tool to convert the **RiverBasinDistrict** shapefile to a GML file.
Note that the shapefile must be prepared according to the valid RiverBasinDistrict shapefile template.
Create a ZIP file containing the files that compose the Shapefile (SHP, SHX, DBF, PRJ and CPG).
Please make sure that all the above files are included

Note:

EEA Reportnet works best with Google Chrome (recommended) or Mozilla Firefox. **The use of Internet Explorer is not recommended.**

Instructions:

- Click the "Choose File" (or "Browse...") button to select the ZIP file with the Shapefile you want to convert.
- Click the "Upload File" button to upload the ZIP file (please be patient, some files may take a while to upload).
- Click the "Refresh File List" button to see the list of files (please be patient, some files may take a while to upload).
- Provide a valid e-mail address and click the "Execute" button.
- When the conversion is ready, the system will send you an e-mail, with a link to the converted file.
- You can then download the file and add the GML to your data delivery envelope in CDR.

Zip: Choose file No file chosen Upload File

File List Refresh File List

E-mail address:

Execute

Step 4: Quality assessment of data files uploaded

Once the data files have been uploaded, they could be assessed based on the following quality assurance validations:

- Schema checks: these will be able to be executed just after the uploading of each data file.
- Within schema checks: these will be able to be executed just after the uploading of each data file.
- Cross schema checks: for these checks to run it is required to upload all the files in advance as the checks use data reported in different files.
- Statistics: these validations provide an overview of the data delivered in terms of counts of elements reported by each schema.
- Registry: these validations check descriptive data against reported spatial data and the spatial data against the identifiers in the first RBMP reporting exercise.

The description of these quality checks are included in an excel sheet "QA specification" available in the CDR (http://cdr.eionet.europa.eu/help/WFD/WFD_521_2016).

You have to run all the QA validations for all your data files by clicking "Run automatic QA"; this will take several minutes. See below the button for the QA validations execution.

Corresponding error reports will be displayed at the envelope level. Errors identified as "blockers" will not allow you to run successfully the next step, which is the release of the envelope. Blockers are obtained when the data files delivered have missing or erroneous elements that may corrupt the integrity of the European database or undermine the consistency of the reported data.

The analysis of the errors will allow you to update your files as necessary and run the QA again until there are no blocking errors (see Step 6b below). In the next step, which is the release of the envelope, all the quality assessments will be run automatically again for all of the data files finally uploaded. The statistics of the data delivered will also be generated.

It is strongly advised to run all the QA routines first and to try to release the envelopes only when all blocking errors have been solved (or only Annex 0 related errors remain – see steps 0 and 6c).

Note that if you report very large files, some QA validations may take a lot of time for their finalisation (over 4 hours) or they were not successfully processed. In those cases, you will receive the following message in the Data Quality tab at the schema level as blocking error:

"The QC process failed. Please try again. If the issue persists please contact the dataflow helpdesk."

For these cases, please wait several hours (suggested time is 8 hours) and then click again on "run automatic QA". The results of your previous request will have been stored in the server and will be delivered very quickly.

For this to happen, however, the second request has to be made for exactly the same files as the first one. Any change to the files, no matter how small, means that the server will recognise the second request as a new one and will need to launch again the QA validations.

In summary, here are the steps you need to follow to run the automatic QA:

1) Click on "Run automatic QA"

2) If the QCs take less than 4 hours you will receive the results in the "Data quality" section and there is no other action needed

3) Otherwise, you receive a message asking you to try again

4) Do not change your files

5) After 8 hours click once more in "Run automatic QA"

6) Check the results in the "Data Quality" section

This procedure is identical in CDR and in CDR-Sandbox. Please do not hesitate to contact WFD Helpdesk if you face any problems with this procedure.

Step 5: Releasing the envelope

a) Once you are satisfied with the data files delivered and no blocking errors have been found in the quality checks, complete your delivery by clicking on the release envelope button.

The purpose of release is to signal that the data have been delivered and will automatically deactivate the envelope for further processing by the Commission and the EEA representatives.

b) Once you click on "Release envelope", the quality assessment rules are run automatically for all the data files uploaded.

Only envelopes with NO blockers will able to be released. In this automatic quality assessment are considered blockers:

- ✓ Missing or erroneous elements that may corrupt the integrity of the European database or undermine the consistency of the reported data (mentioned above).
- ✓ An incomplete envelope. All the required data files need to be delivered in each envelope. For the XML and GML data files list please refer above in Step 2 of this section where is defined which files should be uploaded into each folder/envelope.

To have an overview of the quality assessment results please go to the “Data Quality” tab of the envelope, see below a captures of a QA a test sample.

Overview | History | Data quality

Results of automatic data quality checks

This page displays summary information from all automatic data quality checks for this envelope. If you want to see more detailed results, just follow the "Show more.." links to the individual feedback items.

GWB_UK_20160322.xml

- **INFO**: This delivery passed all checks without errors or warnings Show more...
- **INFO**: Statistics GWB Show more...
- **INFO**: WISE registry validations passed without errors. Show more...
- **INFO**: XML Schema validation passed without errors. Show more...

GWMET_UK_20160322.xml

- **INFO**: This delivery passed all checks without errors or warnings Show more...
- **INFO**: Statistics GWMet Show more...
- **INFO**: XML Schema validation passed without errors. Show more...

Monitoring_UK_20160322.xml

- **INFO**: This delivery passed all checks without errors or warnings Show more...
- **INFO**: Statistics Monitoring Show more...
- **INFO**: WISE registry validations passed without errors. Show more...
- **INFO**: XML Schema validation passed without errors. Show more...

RBMPPoM_UK_20160322.xml

- **INFO**: This delivery passed all checks without errors or warnings Show more...
- **INFO**: Statistics RBMPPoM Show more...
- **BLOCKER: The file does not conform to the data model defined in the XML Schema and blocks your submission. The XML Schema data model specifies the element names, document structure and data types.** Show more...

SWB_UK_20160322.xml

- **BLOCKER: 77 blocking errors found** Show more...
- **INFO**: Statistics SWB Show more...
- **WARNING**: 3 warnings found Show more...
- **BLOCKER: The file does not conform to the data model defined in the XML Schema and blocks your submission. The XML Schema data model specifies the element names, document structure and data types.** Show more...

By clicking on “Show more…” you will see the details of each QA messages.

Feedback: AutomaticQA result for file Monitoring.xml: XML Schema validation

Back to envelope

Subject:	AutomaticQA result for file Monitoring.xml: XML Schema validation
Posted automatically on:	25 Sep 2015 07:44
Task:	Automatic quality assessment
Referred file:	Monitoring.xml

XML Schema validation

BLOCKER The file does not conform to the data model defined in the XML Schema and blocks your submission. The XML Schema data model specifies the element names, document structure and data types.

The file was validated against http://dd.eionet.europa.eu/schemas/WFD2016/Monitoring_2016.xsd

The following table lists the contradictions in document structure, elements using wrong data types or missing mandatory values.

Type	Position	Error message
ERROR	Line: 2, Col: 374	Cannot find the declaration of element 'Monitoring'.

Step 6a: Automatic release of the envelope

If there are no blocking errors, the envelope will be released successfully and a confirmation of receipt according to template in Annex 1 will be automatically provided. Only files in released envelopes are considered to be officially delivered. A copy of this confirmation of receipt should

be delivered to the Commission through the respective Permanent Representation in order to formalise the reporting obligation.

Step 6b: Replace file(s) of causing blockers

In case of blocking errors the envelope will not be released and will remain in draft, you will need to replace the files that provide blocking errors and release the envelope again.

Step 6c: ENV manual revision of the envelope according to Annex0

In case your blocking errors are solely related to your previously reported Annex 0 document, the Commission will perform a manual inspection of your data. For this purpose, the errors of the envelopes which data reporters have unsuccessfully tried to release will be compared to the justifications in the Annex 0 document that has been commented by the Commission and uploaded in Reportnet. If the errors are solely related to elements in the previously checked and accepted Annex 0, the Commission will release the envelope manually (step 6d) and the data reporter will receive the confirmation receipt. If there are other errors, you will receive a standard notification that these need to be solved before releasing the envelope. In that case the envelope will remain as draft for files to be updated (step 6b).

Step 6d: Manual acceptance

In case the blocking errors are solely related to elements in the previously checked and accepted Annex 0, a Commission representative will release manually the envelope after assessment. The acceptance of the data will be communicated through Reportnet-CDR through a confirmation of receipt (see Annex 1 of this document) at the specific envelope level.

Step 7: Close envelope

Finally, the envelope released will be automatically closed.

The data will be subject to further processing and assessment. In case any serious quality issue is discovered during that further processing, the data reporter will be requested to resubmit data. In this case, the data reporter will be notified through the Reportnet-CDR using a standard message (see Annex 2).

In order to receive the notification of the actions automatically by email, **it is strongly recommended that the data reporter be subscribed to the CDR notifications in Reportnet**.

In case resubmission, a new envelope will need to be created and all required files in that envelope will need to be uploaded again, even if only some of the files have been updated. Partial submissions in envelopes are not allowed. In addition, only full XML or GML files are accepted.

4.1 Workflow overview

See below a graph describing the different processes involved in a WFD206 reporting exercise.

Note: Annex 0 errors are blocking errors due to lack of reporting of required elements, previously communicated and accepted by the Commission (see Step 0 in the text)

5 Helpdesk and support

For support on the reporting activities and issues that may arise in the process, MS can email to the WFD helpdesk (wfd.helpdesk@eionet.europa.eu).

6 Annex 1. Template for the confirmation of receipt

European Environment Agency
Kongens Nytorv 6
DK 1050 Copenhagen K

In support of WISE - The Water Information System For Europe

To Whom It May Concern

This confirmation letter shows the status of national data submissions to Reportnet based on the European Reporting Obligation

Water Framework Directive - River Basin Management Plans - 2016 Reporting (http://rod.eionet.europa.eu/obligations/715)

The letter is automatically generated when the authorised national data reporter has released the respective reporting information inside the Central Data Repository (CDR).

The following delivery has been submitted for [**Member State**] and was released on [**date of release**].

Envelope: [**Name of the envelope**]
Location: [**web link to envelope**]

List of files:

1. [**file name**]
2. [**file name**]
3. [**file name**]
4. …

The above-mentioned files were submitted by: [**name of data reporter**] (user name: [**user name of data reporter**])

This confirmation letter is electronically generated by the Reportnet system and therefore not signed.

According to the WISE Reporting Arrangements agreed at the WFD Regulatory Committee in March 2007, this cover letter is generated to be printed and sent officially to the European Commission as proof of reporting delivery.

This confirmation of receipt does not guarantee the completeness and/or the quality of the data. In a subsequent step the Commission will perform a completeness check and a more in-depth QA/QC of the data which can result in a request for resubmission. The potential request for resubmission will be communicated to the data reporter through Reportnet-CDR. In order to receive the notification of the action automatically by email, it is strongly recommended that the data reporter is subscribed to the CDR notifications in Reportnet.

7 Annex 2. Template for unsuccessful delivery

European Environment Agency
Kongens Nytorv 6
DK 1050 Copenhagen K

In support of WISE - The Water Information System For Europe

To Whom It May Concern

This notification refers to the following data submissions to Reportnet:

European Reporting Obligation:	**Water Framework Directive - River Basin Management Plans - 2016 Reporting** (http://rod.eionet.europa.eu/obligations/715)
Submitted by:	[**Member State**]
Date of release:	[**date of release**].
Envelope:	[**Name of the envelope**]
Location:	[**web link to envelope**]

On behalf of the European Commission, DG Environment, the data submitted has been subject to a completeness check and **has been rejected** for its integration in the EU database and further processing.

You are kindly requested to solve the issues indicated below and replace the wrong datasets.