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Second River Basin Management Plans – Member State: Lithuania

Table of contents

Acronyms and definitions

EQS Directive	Environmental Quality Standards Directive
FD	Floods Directive
km	Kilometre
km^2	Kilometre squared
KTM	Key Type of Measure
PoM	Programme of Measures
QA/QC Directive	Quality Assurance / Quality Control Directive
RBD	River Basin District
RBMP	River Basin Management Plan
WFD	Water Framework Directive
WISE	Water Information System for Europe
Annex 0	Member States reported the structured information on the second RBMPs to WISE (Water Information System for Europe). Due to the late availability of the reporting guidance, Member States could include in the reporting an Annex 0, consisting of a short explanatory note identifying what information they were unable to report and the reasons why. This Annex was produced using a template included in the reporting guidance. If Member States reported all the required information, this explanatory note was not necessary.

Foreword

The Water Framework Directive (WFD) (2000/60/EC) requires in its Article 18 that each Member State reports its River Basin Management Plan(s) (RBMPs) to the European Commission. The second RBMPs were due to be adopted by the Member States in December 2015 and reported to the European Commission in March 2016.

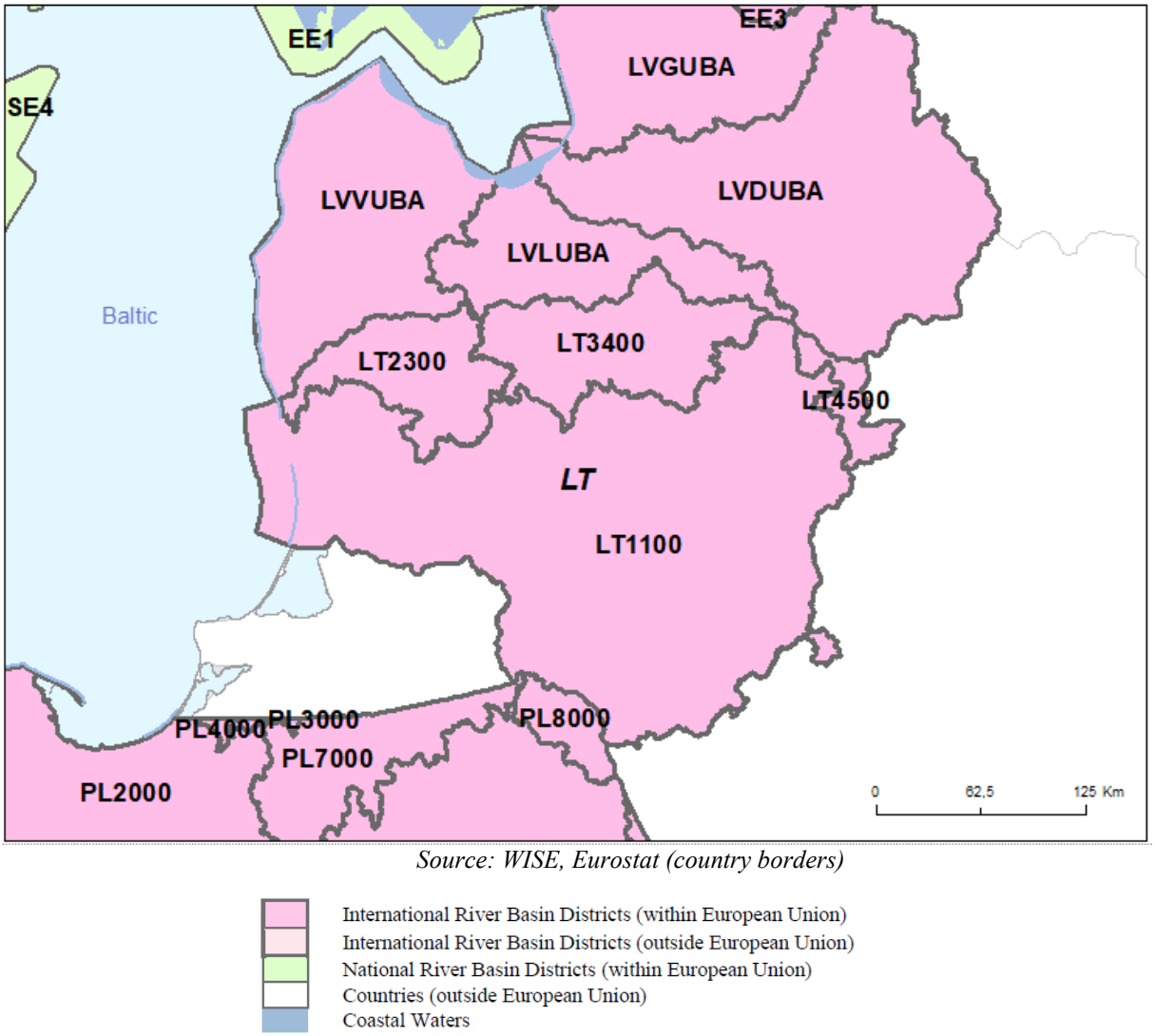
This Member State Assessment report was drafted on the basis of information that was reported by Member States through the Water Information System for Europe (WISE) electronic reporting.

The Member State Reports reflect the situation as reported by each Member State to the European Commission and with reference to RBMPs prepared earlier. The situation in the Member States may have changed since then.

General Information

Lithuania (Map A) has a population of 2.8 million[1] and an area of 65 000 km^2.

Map A - Map of River Basin Districts



Source: WISE, Eurostat (country borders)

Lithuania has four River Basin Districts (RBDs): Nemunas, Venta, Lielupe and Dauguva. All four RBDs in Lithuania are international, they are shared with Latvia, Poland, Belarus and the Russian Federation. The Nemunas RBD covers almost 75% of the country and includes the part of the Nemunas River Basin in Lithuania, the Lithuanian coastal river basin, a small part of the Pregolya RBD (PL), the Lithuanian part of the Curonian Lagoon, transitional waters and the Baltic Sea coastal waters. The Lielupe RBD covers 14%, Venta RBD 10% and Dauguva RBD 2% of the country's territory.

[1] Eurostat (2019).

Information on areas of the national RBDs, including countries sharing parts of the entire RBD, is provided in Table A:

Table A Overview of Lithuania's RBDs

RBD	Name	Short Name[2]	Size[3] (km²)	Countries sharing RBD
LT1100	Nemunas River Basin District	Nemunas RBD	48 412	LT-LV-RU-BY-PL
LT2300	Venta River Basin District	Venta RBD	6 308	LT-LV
LT3400	Lielupe River Basin District	Lielupe RBD	8 917	LT-LV
LT4500	Dauguva River Basin District	Dauguva RBD	1 876	LT-LV-RU-BY

Source: River Basin Management Plans reported to WISE

The share of Lithuania in the respective international RBDs is 50% (Nemunas), 49.1% (Lielupe), 27.4% (Venta) and 2.2% (Dauguva).

Table B Transboundary river basins by category and % share in Lithuania

Name international river basin	National RBD	Countries sharing RBD	Coodination Strategy Category 2	
			km²	%
Nemunas RBD	LT1100	LT-LV-RU-BY-PL	48,412	50
Venta RBD	LT2300	LV	6,308	27.4
Lielupe RBD	LT3400	LV	8,917	49.1
Dauguva RBD	LT4500	LT-LV-RU-BY	1,876	2.2

Source: WISE electronic reports

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.

[2] The short name for each RBD is used throughout this report.
[3] Area includes coastal waters.

Status of second River Basin Management Plan reporting

RBMPs for all four RBDs in Lithuania (Nemunas RBMP, Venta RBMP, Lielupe RBMP, Dauguva RBMP) were published on 21 July 2017.

Documents are available from the European Environment Agency (EEA) EIONET Central Data Repository https://cdr.eionet.europa.eu/.

Key strengths, improvements and weaknesses of the second River Basin Management Plan(s)

The main strengths and shortcomings of the second RBMPs of Lithuania are as follows:

- **Governance and public consultation**

    - Lithuania has coordinated WFD implementation with neighbouring EU Member States, both through international river basin committees and bilateral agreements. No agreement was in place with Lithuania's two non-EU country neighbours, Belarus and Russia. The cooperation between Lithuania and Russia is inactive. Some cooperation projects were carried out with Belarus.

    - There was joint consultation on developing Lithuania's RBMPs and Flood Risk Management Plans including through stakeholder meetings, regional conferences and a national forum.

    - Lithuania did not adopt and publish the RBMPs in accordance with the timetable in the WFD.

- **Characterisation of the RBD**

    - In the second cycle, Lithuania reported that reference conditions had been established for all water body types in each category. For reference conditions biological, hydromorphological and physico-chemical quality elements were applied.

    - The main pressure affecting surface water bodies is diffuse pollution (25% of surface water bodies), mainly due to agricultural activities, followed by hydromorphological alteration (14%) and point source pollution (4%). No significant pressures have been reported for groundwater.

    - Assessment of pressures on surface waters for the second RBMPs uses more quantitative data to specify water bodies. However, a relatively high proportion of pressures are still identified as "unknown". There were still many types of pressure for which expert judgment was used to define the significance of pressures rather than numerical methods.

    - All RBDs have established inventories of emissions including 40 Priority Substances. Tier 1 (point source information) of the methodology was implemented for substances deemed not relevant at RBD level. For substances identified as relevant at RBD level, a combination of Tier 1 and Tier 2 (riverine load) was implemented, in accordance with the CIS Guidance Document no. 28. The data quality was assessed as uncertain or not reported.

- **Monitoring, assessment and classification of ecological status**

    - The number of operational and surveillance monitoring sites has significantly increased for all types of waters in two of the four RBDs.

- Not all the lake and river water bodies included in surveillance monitoring were monitored for all the required biological, hydromorphological or physico-chemical quality elements[4].

- Since the first RBMPs, more methods for assessing the biological quality elements, including the establishment of reference conditions and the definition of class boundaries, have been developed for all types in all water categories. Some gaps still remain.

- Methods for assessing the hydromorphological quality elements are developed for all the relevant quality elements in rivers and lakes, and in transitional and coastal waters[5].

- Monitoring data of bottom sediments in surface water bodies are not used to assess chemical status because there is no established environmental quality standard. The results of monitoring hazardous and priority hazardous substances in bottom sediments are used to assess long-term trends in concentrations.

- 48% of all the water bodies were reported as having less than good ecological status in the second RBMPs.

- **Monitoring, assessment and classification of chemical status in surface water bodies**

  - Between the first and second RBMPs there were no differences between the proportion of surface water bodies with good chemical status, which remained at the same level of 99%. Most of the classified water bodies are associated with a good or medium level of confidence.

  - Between the first and second RBMPs there has been a significant increase in the number of priority substances monitored, and biota and sediment monitoring has been implemented for status and trend assessment.

  - Monitoring is reported for 40 priority substances in water, including all substances identified as discharged. However, monitoring is only carried out in selected sites. For some substances, monitoring frequencies met the recommended minimum frequencies for surveillance monitoring only. For others, the frequencies did not meet the recommended minimum frequency for surveillance monitoring or for operational monitoring.

  - Hexachlorobenzene, mercury and hexabutadiene were monitored in biota for status assessment in all water categories, but in what appears to be a very limited number of sites. The sampling frequencies did not meet the recommended minimum frequency.

[4] Lithuania has subsequently informed the Commission that biological, hydromorphological or physico-chemical parameters have been monitored in all lake and river water bodies, as required by the WFD, except in those river water bodies which were grouped for monitoring purposes.

[5] Lithuania has subsequently clarified that at EU level no methods have been developed for assessing the hydromorphological quality elements of transitional and coastal waters.

- A total of 14 substances were monitored for trend assessment in sediment and/or biota, and generally at frequencies in line with the recommended minimum frequencies. The spatial coverage appears to be very limited.

- **Monitoring, assessment and classification of chemical and quantitative status of groundwater bodies**

  - The assessment of groundwater chemical status was based on an assumption that compounds removed by water purification plant are not taken into account.

  - All groundwater bodies are assessed as being at good chemical status.

  - The number of monitoring sites for quantitative status increased in the second RBMPs and 90% of groundwater bodies are monitored.

  - All groundwater bodies have good quantitative status.

- **Designation of Heavily Modified and Artificial Water Bodies and definition of Good Ecological Potential**

  - The national methodology for heavily modified water body (HMWB) designation has been modified since the first RBMPs. The number of HMWB significantly increased due to the adoption of new criteria.

  - The assessment of good ecological potential is based on monitoring results and mitigation measures. There is no significant change concerning good ecological potential since the first RBMPs. However, further monitoring data has been gathered to support the process of developing the good ecological potential methodology.

- **Environmental objectives and exemptions**

  - Environmental objectives for ecological and chemical status of surface water bodies and chemical and quantitative status of groundwater were reported in all RBDs.

  - Drivers, pressures and pollutants leading to exemptions were reported.

  - Relevant information was lacking in the RBMPs, and reported background documents, to determine whether exemptions related to disproportional costs and natural conditions could be justified in terms of meeting WFD requirements.

- **Programme of Measures**

  - Significant progress has been made, particularly in identifying the gap between current status and good status at a water body level, and the level of implementation of measures required to achieve good status by 2027. Lithuania clarified that the selection was based on efficiency of measures and feasibility of implementation, with

details provided in the background document on updates to the Programme of Measures (PoM).

- No information was provided on the cost of measures or potential European Union (EU) funding. A financial commitment for the implementation of measures was only reported for two sectors.

- Most of the significant pressures causing a failure of objectives are covered by Key Types of Measures (KTM).

- No information has been provided on the River Basin Specific Pollutants causing failure nor on the KTMs in place to address those failures for all RBDs.

- **Measures related to abstractions and water scarcity**

  - Water abstraction pressure has not been reported as relevant for Lithuania, and no information has been provided on water consumptions and trends.

  - Measures under Article 11(3)(c) WFD to promote efficient and sustainable water use were implemented in the previous cycle.

- **Measures related to pollution from agriculture**

  - There is a clear link between agricultural pressures and measures.

  - A gap assessment for the load of Nitrogen and Phosphorus to be reduced to achieve objectives has been performed

  - At the time of drafting the PoM a specific so-called second phase of the pressure analysis and risk assessment had been carried out. During this additional pressure analysis, mapped pressure sources were associated with the status of the water body and the quality elements causing the less than good status.

  - Agricultural measures are mostly mandatory. Their level of ambition appears limited.

  - Implementation of basic measures of Article 11(3)(h) for the control of diffuse pollution from agriculture has been reported in all RBDs.

  - Safeguard zones have been established for abstractions.

  - Farmers and farmers associations were included in the lists of the stakeholders for the public consultation.

  - Financing of agricultural measures is secured in all RBDs.

- **Measures related to pollution from sectors other than agriculture**

    - Lithuania has made progress on implementing measures to reduce pollution from urban wastewater treatment plants.

    - Lithuania has identified KTMs in all RBDs to tackle some non-agricultural sources of pollution, but not all Priority Substances are covered individually, and as noted (in part) above, no KTMs have been reported for River Basin Specific Pollutants.

    - There is no information on the expected effectiveness of the measures identified, and the availability of funding for some of the measures is not yet clear[6].

- **Measures related to hydromorphology**

    - The links between hydromorphological pressures and measures have improved due to the improved reporting on pressures and related KTMs in WISE. However, for significant physical alterations and for dams, barriers and locks, the relevant sector or water use was indicated as unknown or obsolete. Also, significant hydrological and hydromorphological alterations were not assigned to any of the specified sectors according to WISE.

    - Ecological flows have not been derived for the relevant water bodies in any of the RBDs but there are plans to do so during the second cycle. National supplementary measures foresee gathering and assessing information on current status, evaluating the necessary amendments in the existing regulations on flows, and setting new standards for ecological flows definition in order to achieve WFD objectives. According to information subsequently provided by Lithuania, these activities are foreseen as objectives of an ongoing research project, which aims at elaborating a methodology for the assessment of ecological flows.

- **Economic analysis and water pricing policies**

    - The cost-recovery for public water utilities services has been introduced, although it mainly focuses on operational cost. Investment for new infrastructure is very limited, especially for smaller utilities.

    - Water usage for agriculture, irrigation and aquaculture needs greater attention and a clearer price calculation in order to achieve more efficient water usage.

    - Environmental and resource fees are not described in sufficient detail nor in a transparent way.

- **Considerations specific to protected areas (identification, monitoring, objectives and measures)**

[6] Lithuania has subsequently informed the Commission that the measures' expected effectiveness was identified in the background documents.

- Objectives have been set for most of the relevant types of protected areas. However, for nature areas, no information has been provided as to whether the objectives have been met, which implies that the monitoring programme may not provide the necessary data for assessing the status of the protected area.

- **Adaptation to drought and climate change**

  - Climate change was considered in all RBDs on the basis of the Common Implementation Strategy guidance document on how to adapt to climate change. No Drought Management Plans have been developed.

Recommendations

- Lithuania needs to ensure that the next cycle of RBMPs is prepared in accordance with the WFD timetable, so that the third RBMPs are adopted on time.

- In order to ensure the timely achievement of WFD objectives, Lithuania should continue to improve international cooperation, especially with its non-EU country neighbours. This should include coordinated assessments of the technical aspects of the WFD, such as ensuring a harmonised approach for status assessment and a coordinated PoM.

- In the third RBMPs, Lithuania should identify sources of funding, as appropriate, to facilitate implementation of measures to help achieve the WFD objectives.

- Lithuania should adopt an increased level of monitoring, which would lead to less dependence on expert judgment and grouping for the classification of ecological status/potential, and consequently to greater confidence in the assessment of ecological status.

- Lithuania should continue to make progress in transferring the results of intercalibration into all national types and provide clear information on the class boundaries that are used for the status classification of different national types. Lithuania should continue to improve the level of confidence in the assessment of status for all water categories, and the proportion of unknown status categories should be further reduced, including in relation to the status of protected areas. Lithuania should further improve the monitoring of priority substances, including trend monitoring, to ensure that all the relevant substances specified in Directive 2008/105/EC, as amended by Directive 2013/39/EU, are monitored in a way that provides sufficient spatial coverage and temporal resolution.

- Lithuania should further improve its monitoring of surface water, and especially coastal and transitional waters, to ensure that all relevant quality elements in all water categories both in surveillance and operational monitoring are covered.

- Lithuania needs to assess the reasons why WFD objectives are failing to be met so that it can reduce uncertainty and better justify Article 4(4) and 4(5) WFD exemptions in a more thorough and transparent manner.

- Lithuania should ensure a thorough assessment of planned new modifications in line with the requirements of the WFD and as further specified by the Judgment of the European Court of Justice in case C-461/13. Any potential use of exemptions under Article 4(7) needs to be based on a thorough assessment of all the steps, as requested by the WFD. Information on the application of Article 4(7) needs to be reported in the RBMPs.

- Lithuania should provide information on the cost of measures and on any potential EU funding, and secure the necessary financial commitments for implementing measures.

- Lithuania should provide information on how measures have been prioritised.

- Lithuania should identify KTMs in all RBDs for Priority Substances, as well as River Basin Specific Pollutants causing failure of chemical and ecological status, respectively.

- Lithuania should provide information on pesticides in the RBMP.

- In the third RBMP, Lithuania should clearly state to what extent, in terms of area covered and pollution risk mitigated, basic measures (minimum requirements to be complied with) or supplementary measures (designed to be implemented in addition to basic measures) will help to achieve the WFD objectives, and it should identify sources of funding (e.g. CAP Pillar 1, RDP), as appropriate, that will facilitate implementation of these measures.

- Lithuania should implement measures to deal with the pressures identified from slurry storage.

- Lithuania should complete the adoption of measures to improve manure handling and recycling on farms, decrease nutrient discharges (fertiliser applications), perform more controls and monitoring, and identify financing sources to fund these measures.

- Lithuania should continue to review and develop the strategy for delivering WFD objectives, in cooperation with the farming community and the authorities in charge of the common agricultural policy (CAP) in Lithuania to ensure that the third RBMP is technically feasible and that all relevant policies and instruments contribute significantly to RBMPs.

- Lithuania should continue to provide information on what the measures it has taken under the Nitrates Directive will achieve in addressing the eutrophication problem of the Baltic Sea, and for each RBD it should set values for nutrient concentrations in water and for the required reductions.

- Lithuania should make better use of monitoring data and inventories of emissions, including those concerning the atmospheric deposition of pollutants, to identify appropriate measures to tackle pollution from non-agricultural sources.

- Lithuania should improve its assessment of the likely effectiveness of measures against non-agricultural sources of pollution, so that it can better identify the need for supplementary measures.

- Lithuania should define and implement hydromorphological measures in all RBDs, in particular for restoration, and set up a system of authorisation or issuing of permits to ensure appropriate control of physical alterations. The relevant sectors should be identified.

- Lithuania should develop a methodology to derive ecological flows, and associated measures should be identified and implemented.

- Lithuania should continue prioritising the use of green infrastructure and/or natural water retention measures that provide a range of environmental (improvements in water quality,

flood protection, habitat conservation, etc.), social and economic benefits, which in many cases can be more cost-effective than grey infrastructure.

- Lithuania should apply cost recovery for water use activities having a significant impact on water bodies or justify any exemptions using Article 9(4) WFD. Lithuania should also continue to transparently present how financial, environmental and resource costs have been calculated and how the adequate contribution of the different users is ensured. The water-pricing policy needs to be transparently presented in all services and an overview of estimated investments and investment needs should be included in the RBMPs.

Topic 1 Governance and public participation

1.1 Assessment of implementation and compliance with WFD requirements in the second cycle

1.1.1 Administrative arrangements – River Basin Districts

Lithuania prepared four RBMPs, one for each of its RBDs: Nemunas, Venta, Lielupe and Daugava.

All of Lithuania's RBDs are part of international RBDs: Nemunas is part of an international RBD shared with Latvia, Poland, Belarus and Russia; Dauguva is part of an international RBD shared with Latvia, Belarus and Russia; the remaining two, Venta and Lielupe, are part of an international RBD shared with Latvia. All RBD are category type 2.

The longest Lithuanian river is the Nemunas; the RBD covers almost 74% of the country. The smallest RBD is the Daugava, which only covers 2% of the country. Venta and Lielupe cover 10% and 14% of the country, respectively.

1.1.2 Administrative arrangements – competent authorities

Lithuania reported the main competent authority as being the Environmental Protection Agency (the EPA, is part of the Lithuanian Ministry of Environment (MoE)). The EPA has overall responsibility for the administration of all four RBDs. The EPA is responsible for: the delineation of RBDs; the delineation of water bodies (including heavily modified and artificial water bodies); the collection of information for the Register of Protected Areas and the management of the Register; the assessment of human pressures on lakes and rivers; the assessment of the status, the establishment of a system for the classification and the definition of objectives for surface water bodies; the monitoring of surface waters (the EPA is responsible for the preparation of a monitoring programme, co-ordination of monitoring and complex chemical analysis); and public consultation and reporting to the European Commission. Responsibilities for the implementation of water policy are shared between the MoE and institutions subordinated to it (LGS, SSPA, LHS, REPDs). The main responsibilities of the institutions are outlined below:

1. MoE is responsible for organising economic analyses, an economic assessment of proposed measures and the development of measures related to cost recovery for water services. MoE coordinates the activities of subordinated institutions to ensure the implementation of river basin management. Drafting and coordinating international agreements in the field of management of international RBDs also falls under the responsibility of the MoE.

2. The Lithuanian Geological Survey (LGS) has overall responsibility for the implementation of WFD tasks related to groundwater. LGS is responsible for monitoring, characterisation and pressure analysis, the classification of the status of groundwater bodies, the delineation of groundwater bodies at risk of not reaching good status, and establishing objectives for groundwater bodies.

3. The State Service for Protected Areas (SSPA) is responsible for the collection of data on Protected Areas (including areas designated for protection of birds and habitats), the assessment of the status of Protected Areas, the development of measures in Protected Areas and submission of the abovementioned information to the EPA.

4. The Lithuanian Hydrometeorological Service (LHS) is responsible for the hydrological monitoring of rivers and lakes, the assessment of the quantitative status and human pressure on surface water bodies, the development of proposals for objectives of water bodies and the delineation of water bodies at risk with regard to the quantitative status.

5. The Regional Environmental Protection Departments (REPDs) are responsible for the issuance of permits and control of water abstractions and wastewater discharges (including Priority Substances), the collection of information for RBD analysis at the local level, the identification of problems and the enforcement of RBMPs and PoMs.

1.1.3 River Basin Management Plans – structure (sub-plans) and Strategic Environmental Assessment

Lithuania did not prepare sub-plans for its RBMPs.

Lithuania carried out Strategic Environmental Assessments for all of its RBMPs in 2015.

1.1.4 Public consultation

For all four RBMPs, the public and interested parties were informed by: direct mailing, Internet, invitations to stakeholders, local authorities, media (papers, TV, radio), meetings, printed material and social networking. For all four RBMPs, consultation documents were available for the required six months, and documents were available for download. There was no international coordination of public participation.

The following stakeholder groups were actively involved in the development of the RBMPs: energy/hydropower, local/regional authorities, water utilities, NGOs/nature protection and public authorities. The establishment of advisory groups was used for the active involvement of stakeholders.

The public consultation had the following impacts on the RBMPs: the addition of new information, the adjustment to specific measures, changes to the methodology used and the identification of commitments to action in the next cycle.

1.1.5 Integration with the Floods Directive and the Marine Strategy Framework Directive

Lithuania's RBMPs provide information on coordination with the Flood Risk Management Plans prepared under the Floods Directive (FD).

For Nemunas RBMP, joint consultation was held with the Marine Strategy Framework Directive and Nitrate Directive. The Nemunas RBMP contains a reference to the Marine Strategy Framework Directive and states that measures are compatible with its objectives.

1.1.6 International coordination and co-operation

All four RBDs in Lithuania are part of international RBDs, and Lithuania reported to WISE and EIONET database that each international RBDs is Category 2, ie. an international agreement and permanent body is in place.

Coordination with Latvia is carried out on the basis of an agreement between the Ministries of Environment of the two Member States. Key cooperation activities mentioned in the agreement

cover the characterisation of water bodies, the monitoring and coordination of PoM, water quality typology and classification, monitoring, and the exchange of information.

Since 2005, coordination with Poland is carried out on the basis of Government working groups. On the basis of the Lithuania and Poland Agreement on Cooperation in the Field of Transboundary Water Use and Protection, the Lithuanian-Polish Transboundary Water Commission was established. The commission contains three working groups. Meetings were held on regular basis. Some coordination activities were done via the Baltic Marine Environment Protection Commission (HELCOM) platform.

No agreement was in place with Lithuania's two non-Member State country neighbours, Belarus and Russia.

Lithuania informed that negotiations with Russia and with Belarus on co-operation for river basin management have been on hold since 2003. A few small projects on Nemunas river quality and the interaction of a flow regime due to a newly constructed water dam were done in 2017 and 2018 with Belarus.

A few pilot projects with Belarus on the Nemunas RBD are ongoing. Common GIS maps with Belarus for transboundary water body assessment, using Lithuanian methodology, have been made.

1.2 Main changes in implementation and compliance since the first cycle

Lithuania has strengthened international coordination on water management, including with Belarus (in the Nemunas RBD).

1.3 Progress with Commission recommendations

The Commission recommendations based on the first RBMPs and PoM requested action on the following:

- Recommendation: *Lithuania needs to further enhance the coordination with other EU Member States as well as third countries with which it shares the RBDs, and ensure that international RBMPs are prepared at least with other EU Member States, while endeavouring to prepare international RBMPs involving third countries.*

  Assessment: Ongoing international RBMPs on cooperation with Poland for Nemunas RBD, including harmonized assessment information (status of transboundary water bodies, their root-causes, identification of possible common issues, etc.) have been prepared and included in the second cycle RBMPs of each country. Harmonizing actions for transboundary water bodies have also been carried out with Latvia. Many coordination activities have been done via the HELCOM platform. Regular information exchange is taking place with non-EU countries. Activities in the frame of international projects provided inputs for the national Nemunas RBMPs, including in relation to climate change impacts. Common GIS maps with Belarus have been developed, and a transboundary water body assessment using Lithuanian methodology has been made.

  No intergovernmental agreements were in place with Belarus or Russia, and regular meetings with these countries did not take place. However, intergovernmental agreements were in place with Poland and Latvia. This recommendation has therefore been partially fulfilled.

- Recommendation: *Ensure coherent trans-boundary cooperation in PoMs development (with Latvia)*.

Assessment: Intergovernmental agreements were in place with Latvia. This recommendation has therefore been partially fulfilled.

- Recommendation: *Use Marine Strategy Framework Directive results for preparing the second RBMPs. Marine Strategy Framework Directive objectives should be taken into account when defining WFD measures.*

Assessment: Interrelationships between the Marine Strategy Framework Directive and the second RBMPs were taken into account. However, in the RBMPs reports no clear explanations have been presented as to how any actual steps were taken into account. Therefore, this recommendation is considered to a large extent as fulfilled.

Topic 2 Characterisation of River Basin Districts

2.1 Assessment of implementation and compliance with WFD requirements in the second cycle

2.1.1 Delineation of water bodies

Overall, the number of surface water bodies remained largely the same between the first and second RBMPs (Table 2.1). There are some small changes of water bodies that were delineated in RBDs for the second RBMP.

The WFD states that, for RBD management purposes, all watercourses with a basin area of more than 10 km^2 should be included in river basins, whereas in the 1st RBMPs, only rivers with a basin area equal to or exceeding 50 km^2 had been delineated as water bodies in Lithuania. The analysis of research and monitoring data shows that almost all rivers with an area of 10-30 km^2 in the basin are completely or almost completely dry during the summer drought and it is not possible to measure the values of quality element indicators during that period. As rivers with a basin area of less than 30 km^2 do not have permanent water flow, and depend on climatic conditions, the species diversity of aquatic organisms is poor and communities are fragile. Therefore, in the second RBMPs, only river water bodies with a basin area of more than 30 km^2 were included. Lakes and ponds larger than 50 hectares, as well as artificial water bodies, were also included into the second cycle. This has resulted in a 17% reduction in the river basin area. The number of transitional and coastal water bodies remains the same as the previous cycle. Some small changes were applied to the basin area due to more precise GIS topology.

Table 2.1 Number and area/length of delineated surface water bodies in Lithuania for the second and first cycles

Year	RBD	Lakes		Rivers		Transitional		Coastal	
		Number of water bodies	Total Area (km^2) of water bodies	Number of water bodies	Total Area (km^2) of water bodies	Number of water bodies	Total Area (km^2) of water bodies	Number of water bodies	Total Area (km^2) of water bodies
2016	LT1100	285	611,883	582	8651,982	4	513,509	2	114,169
2016	LT2300	20	36,725	95	1177,072	0	0	0	0
2016	LT3400	19	45,759	128	1669,673	0	0	0	0
2016	LT4500	33	130,834	17	254,794	0	0	0	0
Total		**357,0**	**825,2**	**822,0**	**11753,5**	**4,0**	**513,5**	**2,0**	**114,2**
2010	LT1100	276	602,9	584	10198	4	515,1	2	114,8
2010	LT2300	20	36,22	104	1514	0	0	0	0
2010	LT3400	17	44,16	124	2257	0	0	0	0
2010	LT4500	32	126,146	20	282	0	0	0	0
Total		**345,0**	**809,4**	**832,0**	**14251,0**	**4,0**	**515,1**	**2,0**	**114,8**

Source: WISE electronic reports

Table 2.2 Size distribution of surface water bodies in Lithuania in the second and first cycles

Year	RBD	Lake Area (km²)			River length (km)			Transitional (km²)			Coastal (km²)		
		Min	Max	Average	Min	Max	Average	Min	Max	Average	Min	Max	Average
2010	LT1100	0,5	47,5	2,2	2,0	225,0	17,5	6,6	220,6	128,8	32,4	82,4	57,4
2010	LT2300	0,5	9,6	1,8	3,0	88,0	14,6						
2010	LT3400	0,6	11,9	2,6	4,0	100,0	18,2						
2010	LT4500	0,5	36,2	3,9	3,0	58,0	14,1						
2016	LT1100	0,5	47,5	2,1	0,6	168,4	14,9	6,5	219,3	128,4	32,4	81,8	57,1
2016	LT2300	0,5	9,9	1,8	2,8	88,3	12,4						
2016	LT3400	0,5	11,9	2,4	0,7	99,6	13,0						
2016	LT4500	0,5	36,2	4,0	3,1	51,7	15,0						

Source: WISE electronic reports

Table 2.3 Type of change in delineation of groundwater and surface water bodies in Lithuania between the second and first cycles

Type of water body change for second cycle	Lake Water Body	River Water Body	Transitional Water Body	Coastal Water Body	Groundwater Body
Change in code	32	0	0	0	0
Extended area	2	0	0	0	2
Reduced area	0	0	0	0	5
Creation	12	158	0	0	0
Deletion	0	168	0	0	0
No change	311	664	4	2	13
Total water bodies before deletion	357	990	4	2	20
Delineated for second cycle (after deletion from first cycle)	357	822	4	2	20

Source: WISE electronic reports

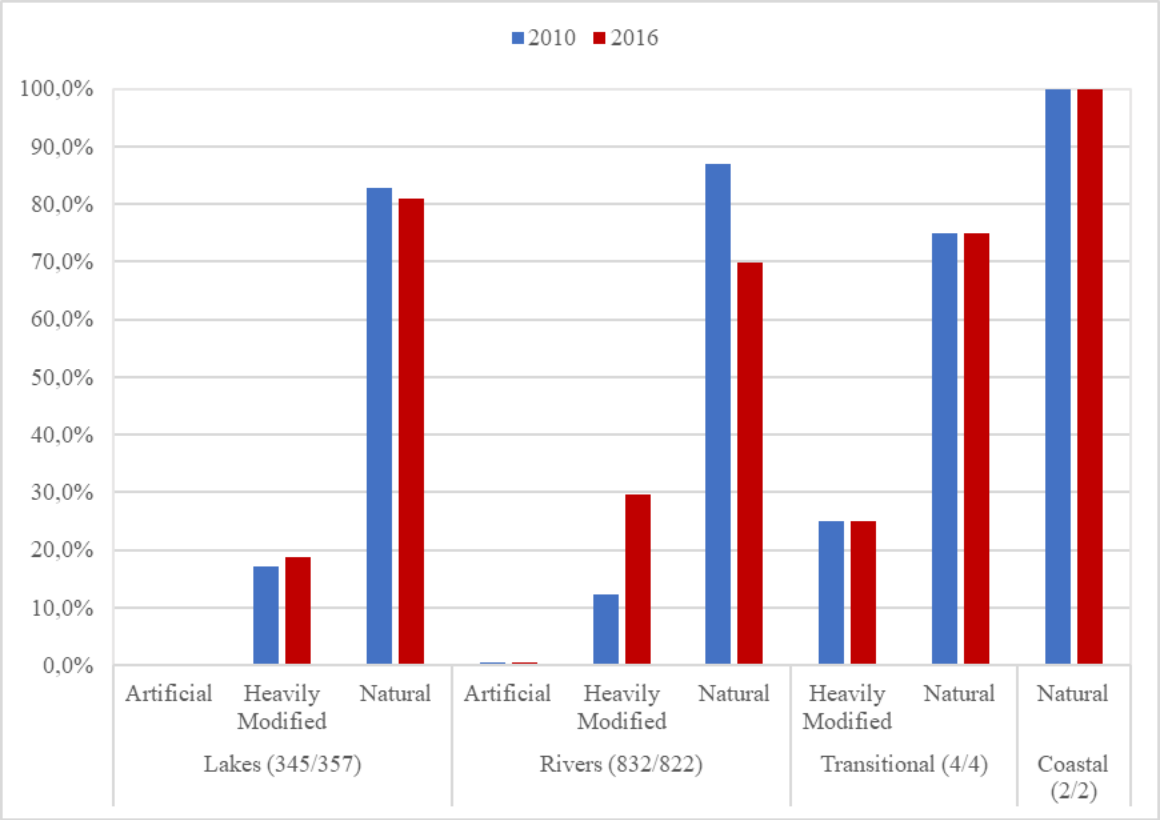
2.1.2 Designation of heavily modified and artificial water bodies

The uses associated HWMBs that have been reported are hydropower and agriculture-land drainage. When reviewing the list of HWMBs during the second cycle, three additional water bodies were assigned due to the agriculture-land drainage. The justification for the exclusion is based on the WFD General Implementation Strategy Guidance Document no. 4 – 'Identification and designation of heavily modified and artificial water bodies. Due to certain requirements to maintain drainage systems, the recovery of ditches in intensive farming regions is challenging. Taking into account the size of land drained for agricultural purposes and their importance to the national economy and the possible consequences of the renaturalization of regulated rivers, the regulated riverbeds flowing in the regions of intensive agriculture are classified as heavily modified water bodies (HMWBs). For this reason, the number of surface water bodies identified as natural was reduced and the number designated as heavily modified increased by 8%.

There were no changes in the number of artificial water bodies between the first and second cycles. Lithuania has reported one artificial lake and four channels considered as rivers, these figures are the same for both cycles. All artificial water bodies are in the Nemunas RBD, except one channel allocated in the Venta RBD.

There were no changes in the number of transitional and coastal water bodies between the first and second cycles.

Figure 2.1 Proportion of surface water bodies in Lithuania designated as artificial, heavily modified and natural for the second and first cycles. NB - the numbers in parenthesis are the numbers of water bodies in each water category



Source: *WISE electronic reports*

2.1.3 Delineation of groundwater bodies

The number of groundwater bodies was reported to be the same in the first and the second cycle (Table 2.4). The boundaries of the groundwater basins have been clarified in order to ensure that all groundwater basins are integrated, leaving no unrelated parts.

Table 2.4 Number and area of delineated groundwater bodies in Lithuania for the second and first cycles

Year	RBD	Number	Area (km2)		
			Minimum	Maximum	Average
2010	LT1100	12,0	332,0	19818,0	4620,8
2010	LT2300	1,0	6276,0	6276,0	6276,0
2010	LT3400	5,0	508,0	4438,0	1789,2
2010	LT4500	2,0	752,0	1123,0	937,5
2016	LT1100	12,0	296,4	15349,1	3982,9
2016	LT2300	1,0	6308,5	6308,5	6308,5
2016	LT3400	5,0	508,5	4442,2	1784,0
2016	LT4500	2,0	752,8	1197,5	975,2

Source: WISE electronic reports

2.1.4 Identification of transboundary water bodies

Transboundary river water bodies have been designated for each RBD, including transboundary lake water bodies in Nemunas and Dauguva RBDs, and two transboundary coastal water bodies in the Nemunas RBD.

No transboundary groundwater bodies have been identified. However, there are two groundwater monitoring points common with Poland for the Nemunas RBD.

2.1.5 Typology of surface water bodies

Table 2.5 shows the number of surface water body types at RBD level in Lithuania for the first and second RBMPs. Five river types were reported for Lithuania in the second cycle; all types were common for all RBDs. Two coastal, three transitional and three lake types were reported. There were no changes in the number of types reported for each water category in each RBD between the two RBMPs.

No information was found in the RBMPs on whether the typology was coordinated with neighbouring Member States, ie. Poland and Latvia. However, it was indicated in the background documents that the typology of shared borders between Member States was considered and researched. A short section on both Member States is included in the background documents.

Table 2.5 Number of surface water body types at RBD level in Lithuania for the first and second cycles) and changes observed.

RBD	Rivers		Lakes		Transitional		Coastal	
	2010	2016	2010	2016	2010	2016	2010	2016
LT1100	5	5	3	3	3	3	2	2
LT2300	5	5	2	2	0	0	0	0

LT3400	5	5	2	2	0	0	0	0
LT4500	3	3	3	3	0	0	0	0

Source: WISE electronic reports

2.1.6 Establishment of reference conditions for surface water bodies

During the second cycle, an updated monitoring programme of surface water bodies was carried out, which resulted in the collection of more data on the status of surface water bodies. Progress has also been made in intercalibrating methods for examining and assessing the ecological status of water bodies by biological quality elements with other EU countries. Intercalibration compares surface water assessment criteria and tests methods to ensure that good ecological status of surface water bodies is understood and assessed in comparable ways and in line with the WFD requirements in all EU countries. Taking into account the results of this work and in order to better manage the RBDs in 2016–2021, the methodology for determining the status of surface water bodies was approved by the Minister of Environment. This resulted in the inclusion of more biological quality elements, and approval of criteria for the assessment of biological, hydromorhological and physico-chemical quality elements.

Some information was provided in the RBMPs concerning coordination in the identification of type-specific reference conditions with other Member States or non-EU countries.

Table 2.6. Percentage of surface water body types in Lithuania with reference conditions established for all, some and none of the biological, hydromorphological and physico-chemical quality elements.

Water category	Water types reference conditions established	Biological quality elements	Hydromorphological quality elements	Physicochemical quality elements
Rivers	All	100%	100%	100%
	Some			
	None			
Lakes	All		100%	100%
	Some	100%		
	None			
Transitional	All		67%	100%
	Some	100%		
	None		33%	
Coastal	All			100%
	Some	100%		
	None		100%	

Water category	Water types reference conditions established	Biological quality elements	Hydromorphological quality elements	Physicochemical quality elements
Rivers	**All**			

	Some	100%	100%	100%
	None			
Lakes	**All**	100%		
	Some			
	None		100%	100%
Transitional	**All**			
	Some	100%		
	None		100%	100%
Coastal	**All**			
	Some	100%		
	None		100%	100%

Source: WISE electronic reports

2.1.7 Characteristics of groundwater bodies

The geological formation of the aquifer types in which groundwater bodies reside, and the details of whether groundwater bodies are layered, have been reported. For all RBDs further characterisation work has been reported since the first cycle with the inclusion of an assessment of linkages between groundwater bodies, and surface water bodies and terrestrial ecosystems. In the northern part of Lielupė RBD there is a karst area, where underground voids, caves, cracks are formed in the shallow depths of the earth due to the melting of gypsum and karstic forms - collapses are formed on the surface of the earth. The water quality in groundwater basins is generally good. There are five potential at risk groundwater basins, where the chemical composition of drinking water does not meet the requirements of drinking water standards due to natural reasons, mostly chlorides and sulphates.

2.1.8 Significant pressures on water bodies

In the second cycle Lithuania identified ten significant pressures on surface waters, such as diffuse pollution from discharges not connected to sewerage networks, and diffuse agricultural and point source pressures from urban wastewater in all RBDs. 'Hydromorphological alteration – Other' was the most reported significant pressure on coastal and transitional waters in Lithuania in the second cycle. Some water bodies experience unknown and historical pressures. No abstraction pressures were reported.

There were only minor changes in the delineation of surface water bodies in Lithuania between the RBMPs. However, some noticeable differences between the pressure types and extent of pressures between the two RBMPs arose as a result of a significant reduction of the proportion of pressures from point sources due to construction of new wastewater treatment plants.

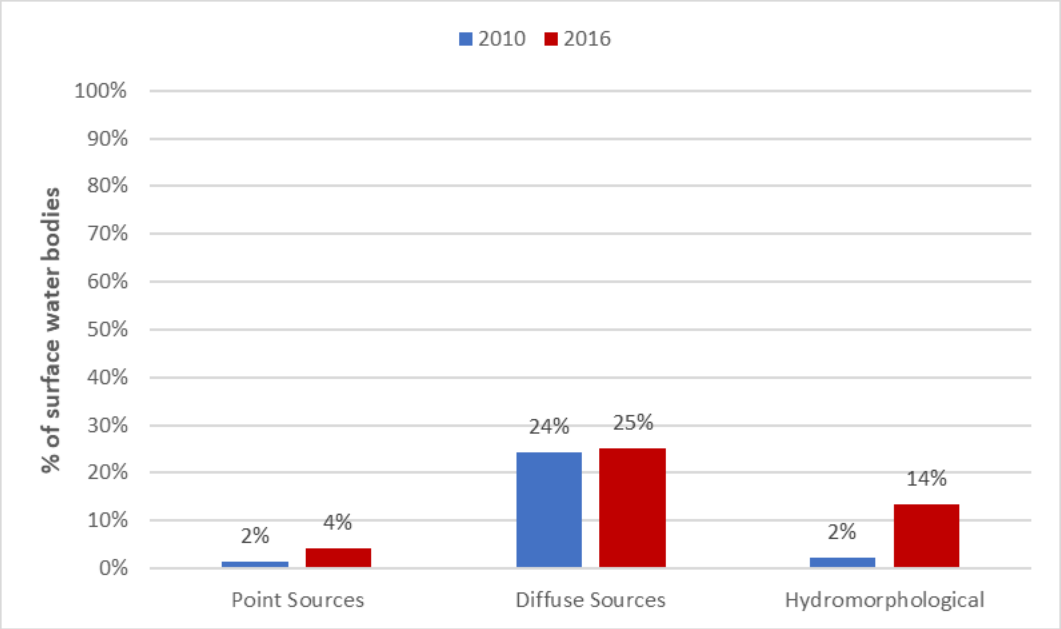
For groundwater bodies, 'no significant pressure' was reported for 100% of groundwater bodies.

For surface water bodies, the most significant pressures reported were diffuse pollution (25%),- hydromorphological alteration (14 %), and point source pollution (4%).

In the second RBMPs it was reported that nine pressures were not assessed for surface waters, including introduced species and diseases. The criteria for the identification of pressures have been described in more detail in a background document of the second RBMPs. The basis for

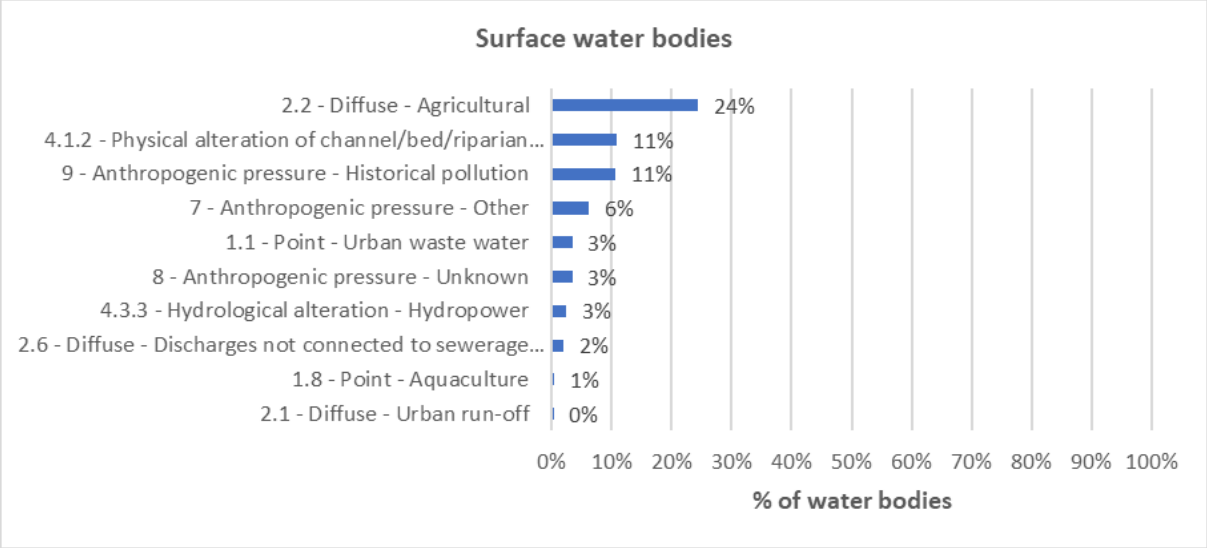
the distribution of pressures in Lithuania was an indicative list of potential pressure sources presented in the Guidance for reporting under the WFD.

Figure 2.2 Comparison of pressures on surface water bodies in Lithuania in the first and second cycles. Pressures are presented at the aggregated level. NB - there were 1,185 identified surface water bodies for the second cycle and 0 for the first cycle



Source: WISE electronic reports

Figure 2.3 The 10 most significant pressures on surface water bodies and groundwater bodies in Lithuania for the second cycle



Source: WISE electronic reports

2.1.9 Definition and assessment of significant pressures on surface and groundwater

For surface waters, numerical tools and expert judgement were used to define significant pressures from point and diffuse sources and water flow pressures. For abstraction pressures, numerical tools were used. For surface water bodies, morphological pressures related with human

impact activities were identified. In the second RBMPs, the pressures assessment was more precisely presented, by water body, rather than generalised. This was done by identifying the pressures on the basis of the boundary of the river basin area and the geographic location of the pressure sources. The threshold values for point sources were also presented in a table in the RBMP, which were limit concentration values used to calculate the permissible load of different parameters, such as biological oxygen demand, chemical oxygen demand, nitrogen, phosphorus and metals. This implies that some threshold values were used for both point and diffuse source pressures, and it was reported that significance was not defined in terms of thresholds in the WISE data but that they were linked to the failure of objectives.

To determine pressure sources, including significant ones, the risk of not achieving the environmental objectives for water bodies due to various pressure sources was analysed, taking into account the trends affecting pressure sources and the likelihood of trend development. The probable vulnerability to pressures was classified as: at risk, possibly at risk and not at risk. The risk was reported to be based on two aspects: 1) whether or not the environmental objectives have been achieved; and 2) by identifying the pressures from human activity that caused the failure to achieve the environmental objectives.

The mapped pressure sources were then linked to the status of the water body and to quality elements displaying poor status. As a result of the analysis, it was determined whether the effect of the pressure source actually influences the status of the water body. It is stated in the RBMPs that a clear link was established between status and pressure sources.

For groundwater, it was reported that a combination of expert judgement and numerical tools was used to define diffuse and point source pressures, abstractions and artificial recharges. Information about the tools used to define pressures on groundwater bodies is provided in the RBMPs. For groundwaters, expert judgment was used for defining significant pressures from point and diffuse sources, abstraction, and artificial recharge. This is less robust than numerical methods. The significance of pressures has been reported to be defined in terms of thresholds but were reported as not being linked to the potential failure of objectives.

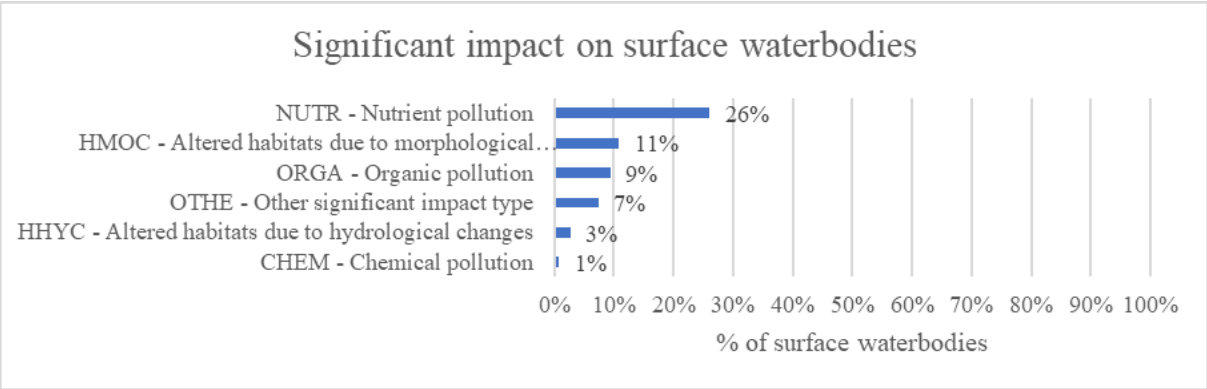
No groundwater bodies in any of the RBDs were reported to be at risk of failing to meet good chemical or quantitative status in the second RBMP.

2.1.10 Significant impacts on water bodies

In the second RBMP cycle, the most significant impact on surface water bodies was nutrient pollution (26% of surface water bodies), altered habitats due to morphological changes (11%), and organic pollutants (9%) (Figure 2.4).

For groundwater bodies, ‘no significant impacts’ were reported for 100% of groundwater bodies.

Figure 2.4 Significant impacts on surface water and groundwater bodies in Lithuania for the second cycle. Percentages of numbers of water bodies



Source: WISE electronic reports

2.1.11 Groundwater bodies at risk of not meeting good status

The status of groundwater bodies used for drinking water supply is good according to the results of monitoring. In most cases, the quality of water that does not meet the requirements for drinking water is determined by natural conditions. No groundwater bodies in any of the RBDs were reported to be at risk of failing to meet good chemical or quantitative status in the second RBMP.

Potential issues related to ground water quality have been associated with the newly constructed nuclear power plant in Belarus (called Astrava), which will use the water of the Neris River for the nuclear rector's cooling. Any accidental pollution from the nuclear power plant, would reach the territory of Lithuania via river flows within a few days. Wells of three large cities (Vilnius, Kaunas, Jonava) are located near to the Neris River. Depending on the operating conditions of the wellfields, the contaminated water could reach aquifers within seven to 29 days. Municipalities directly threatened by possible contamination of radioactive materials are preparing plans for the exploitation of new groundwater resources unconnecterd to the Neris River

2.1.12 Quantification and apportionment of pressures

Significant effects of economic activities are those that result in the fulfilment of the requirements of good ecological and / or chemical status in water bodies. Significant impacts can be caused by pollution from one pollution source or by several pollution sources, as well as hydromorphological changes in water bodies, which can result from the straightening of riverbeds and the impact of hydroelectric power plants.

Following the analysis of pollution sources and the assessment of their impact, the main factors influencing the ecological status of Lithuanian RBDs were identified as: diffuse pollution, most of which is caused by agricultural activities; point source pollution, originating from urban and settlement wastewater treatment plants, pollution from urban and settlement rainwater (surface) discharges and pollution from industrial and industrial wastewater discharges; transboundary pollution, which consists of pollution loads from neighbouring countries; and, secondary or historical pollution resulting from long-term past pollution. Hydromorphological pressures on rivers include pollution from aquaculture, longitudinal discontinuity (no fish passes, old unused dams), flow regime fluctuation, problems with ecological flows. Hydromorphological pressures on lakes include the regulation of water levels, coastal siltation and the increase in water plants.

During the preparation of RBMPs, diffuse agricultural pollution was identified as one of the most important and significant factors influencing the quality of water bodies. Diffuse agricultural pollution may account for up to 80% of the total nitrate pollution in water bodies.

2.1.13 Quantification of gaps to be filled for pressures causing failure of status objectives

Priority Substances and other substances causing failure of good chemical status have been reported. Measures to tackle these substances in order to achieve good status by 2027 have been reported. The biggest pressure to surface water body comes from diffuse pollution, most of which is caused by agricultural activities, as well as point source pollution originating from industrial wastewater discharges, transboundary pollution, and historical pollution resulting from long-term past pollution. The effects of agricultural pollution remained small between the first and second cycles. The requirements of good ecological status due to the impact of agricultural pollution are not met for 20% of water bodies in the RBD.

2.1.14 Inventories of emissions, discharges and losses of chemical substances

Article 5 of the Environmental Quality Standards Directive (EQS Directive[7]) requires Member States to establish an inventory of emissions, discharges and losses of all Priority Substances and other pollutants listed in Part A of Annex I of the EQS Directive for each RBD, or part thereof, lying within their territory. This inventory should allow Member States to further target measures to tackle pollution from Priority Substances. It should also inform the review of the monitoring networks, and allow for assessment of progress made in reducing (or suppressing) emissions, discharges and losses of Priority Substances.

All four RBDs in Lithuania reported inventories of emissions, discharges and losses and all Priority Substances and groups of Priority Substances are included. Some substances, that cannot be tested in Lithuania, were sent to foreign laboratories.

2.2 Main changes in implementation and compliance since the first cycle

Overall, the number of surface water bodies remained mostly the same between the first and second RBMPs. For groundwater bodies there were no changes, either in quantity or in quality, between the first and second RBMPs.

In the second cycle, there was a reduction in the number of water bodies affected by point source pollution from the first cycle, mainly due to the construction of new wastewater treatment plants, and diffused pollution for all RBDs remained the main pressure affecting surface water bodies.

In the first RBMPs, Lithuania only reported pressures at an aggregated level and therefore it is difficult to compare reporting of pressures between the two cycles. Since the first RBMPs there has been an apparent increase in hydromorphological pressures and unknown anthropogenic pressures (or other pressures) for surface water bodies.

The newly constructed Astrava nuclear power plant in Belarus has resulted in a new issue concerning potential risks to groundwater quality, for which no significant pressures have been reported.

[7] 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/legalcontent/EN/TXT/?uri=CELEX:02008L0105-20130913

2.3 Progress with Commission recommendations

The Commission recommendations based on the first RBMPs and PoM requested action on the following:

- Recommendation: *Finalise the assessment methods for quality elements, make full use of the 'one-out all-out' principle, include River Basin Specific Pollutants in the ecological status assessment, assess chemical status in relation to both Annual Average-Environmental Quality Standards and Maximum Allowable Concentrations Environmental Quality Standards, consider ubiquitous persistent, bioaccumulative and toxic substances and atmospheric deposition when deciding on monitoring sites for the second RBMPs cycle.*

Assessment: Lithuania finalised the assessment methods for quality elements. The list of specific pollutants and values of EQS were established during preparation of the second RBMPs, including Annual Average EQS and Maximum Allowable Concentrations EQS for toxic substances. This recommendation has been fulfilled.

Topic 3 Monitoring, assessment and classification of ecological status in surface water bodies

3.1 Assessment of implementation and compliance with WFD requirements in the second cycle

3.1.1 Monitoring of ecological status/potential

Monitoring programmes

Article 8(1) 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.

Two monitoring programmes covering both surface water (all categories) and groundwater were reported for each of the four RBDs for the second cycle. Rivers, lakes, transitional and coastal waters were included for both periods in all four RBDs.

Monitoring sites and monitored water bodies used for surveillance and operational monitoring

Table 3.1 gives the number of sites used for different purposes for the second RBMPs and Table 3.2 compares the number of monitoring sites used for surveillance and operational purposes from the first to the second RBMPs.

Table 3.2 shows that there are more monitoring sites included in the surveillance monitoring programme than in the operational monitoring programme for lakes while for rivers it is the opposite. For transitional and coastal waters, only an operational monitoring programme is foreseen.

Figure 3.1 shows the percentage of water bodies included in surveillance and operational monitoring in the first and second RBMPs. Similar percentages of transitional and coastal water bodies were included in operational monitoring for the first and second RBMPs.

Overall, in Lithuania there were significant increases in the number of monitoring sites in lakes (289 to 357 sites) and rivers (436 to 578 sites) from the first to the second RBMPs. An increase in monitoring sites was indicated in all RBMPs.

Monitoring sites for nutrient sensitive areas under the Urban Waste Water Treatment Directive were not included in the second cycle RBMPs for transitional and coastal waters.

Table 3.1 Number of sites used for surveillance and operational monitoring in Lithuania for the second and first RBMPs. NB - for reasons of comparability with data reported in the first RBMPs, data for the second RBMPs do not take into account whether sites are used for ecological and/or chemical monitoring

	Rivers		Lakes		Transitional		Coastal	
	Surv.	Op	Surv.	Op	Surv.	Op	Surv.	Op
Second RBMPs								
LT1100	139	251	176	109		17		6

	Rivers		Lakes		Transitional		Coastal	
	Surv.	**Op**	**Surv.**	**Op**	**Surv.**	**Op**	**Surv.**	**Op**
LT2300	26	32	6	14				
LT3400	20	101	8	11				
LT4500	8	1	24	9				
Total	193	385	214	143	0	17	0	6
Total number of monitoring site used for surveillance and/or operational monitoring	578		357		17		6	
First RBMPs								
LT1100	110	190	187	89		16		6
LT2300	8	21	1	5				
LT4500	2	3		1				
LT3400	8	94		6				
Total	128	308	188	101	0	16	0	6
Total number of monitoring site used for surveillance and/or operational monitoring	436		289		16		6	

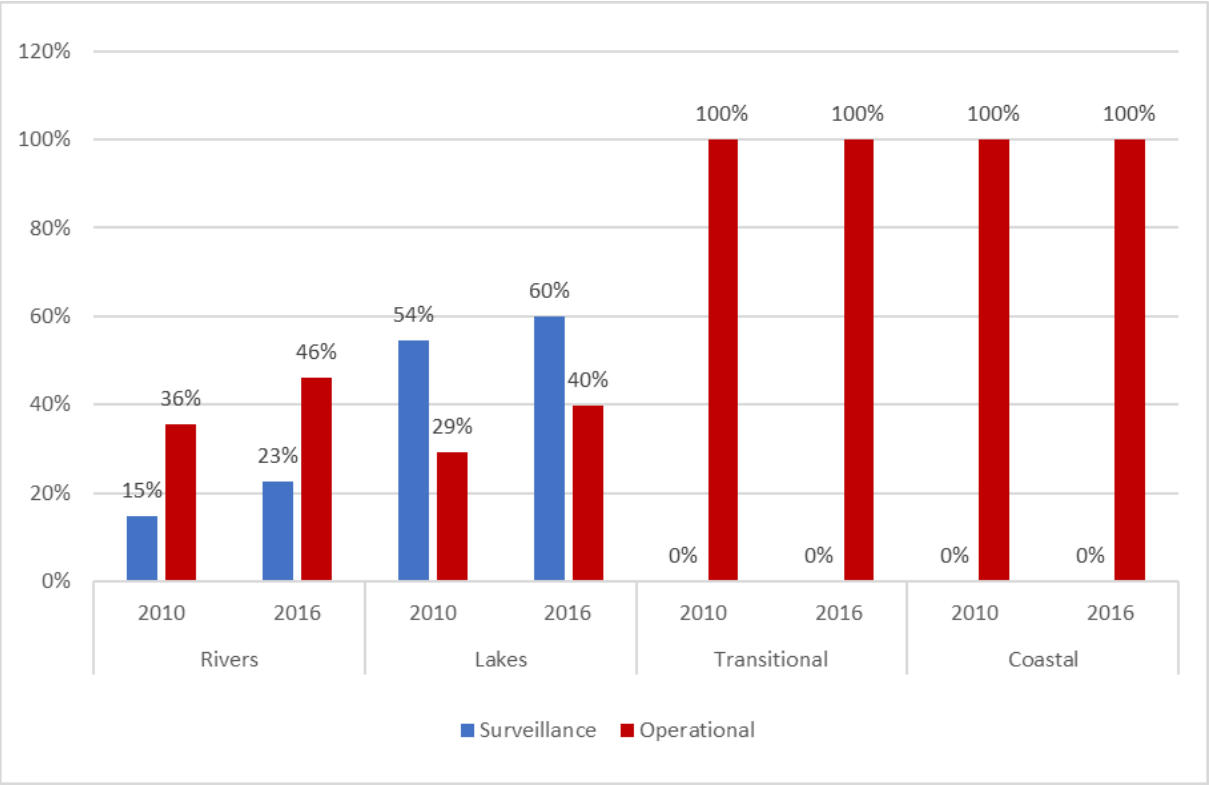
Source: WISE electronic reports

Table 3.2 Number of monitoring sites in relevant water categories used for different purposes for the second RBMP in Lithuania.

Monitoring Purpose	Lakes	Rivers	Transitional	Coastal
CHE - Chemical status	1	15	13	3
ECO - Ecological status	357	578	16	6
HAB - Protection of habitats or species depending on water - WFD Annex IV.1.v	106	120	12	5
MSF - Marine Strategy Framework Directive monitoring network			9	6
NID - Nutrient sensitive area under the Nitrates Directive - WFD Annex IV.1.iv	357	578	7	3
OPE - Operational monitoring	143	385	17	6
REF - Reference network monitoring site	12	11		
RIV - International network of a river convention (including bilateral agreements)		16	6	2
SEA - International network of a sea convention		6	2	2
SOE - EIONET State of Environment monitoring	357	578	5	1
SUR - Surveillance monitoring	214	193		
TRE - Chemical trend assessment	1	15	13	3
UWW - Nutrient sensitive area under the Urban Waste Water Treatment Directive - WFD Annex IV.1.iv	357	578		

Source: WISE electronic reports

Figure 3.1 Percentage of water bodies included in surveillance and operational monitoring in Lithuania for the first and second RBMPs. NB - no differentiation is made between water bodies included in ecological and/or chemical monitoring



Source: WISE electronic reports

In total, the monitoring network of water bodies in the Lithuanian RBDs consists of 957 sites, including 578 for rivers and 357 for lakes, as well as 22 sites for coastal and transitional water bodies. The monitoring network of river water bodies in the Nemunas RBD consists of 390 sites: surveillance monitoring was performed at 140 sites, and operational monitoring at 250 sites. The monitoring program for lakes and ponds in the Nemunas RBD includes 285 water bodies. Surveillance monitoring of maintenance were performed in seven water bodies (as reference conditions). Operational monitoring was performed in 168 water bodies (150 lakes, 18 ponds), and surveillance monitoring in 80 lakes and 30 ponds.

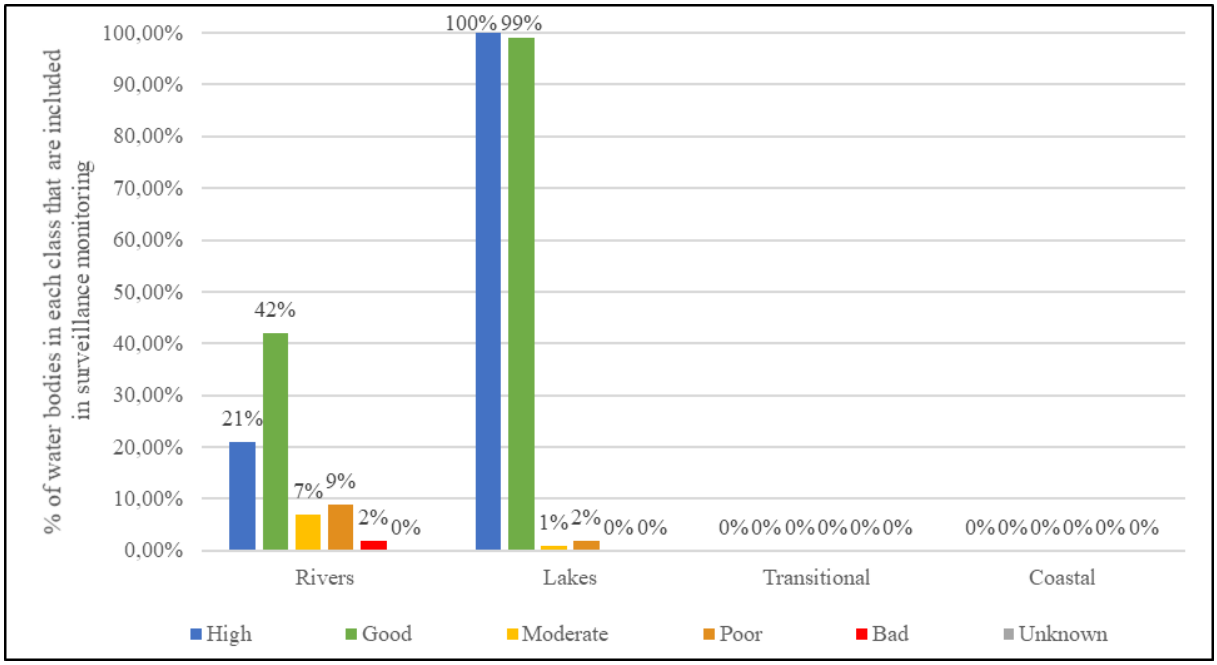
The monitoring network of river water bodies in the Lielupė RBD consists of 121 sites: surveillance monitoring was performed at 20 sites, and operational monitoring at 101 sites. The monitoring program of water bodies in the category of lakes in the Lielupė RBD includes 19 water bodies. Surveillance monitoring of maintenance were performed in eight water bodies (five lakes and three ponds), and operational monitoring was performed in the remaining 11 water bodies (six lakes and five ponds).

The monitoring network of river water bodies in the Dauguva RBD consists of nine sites: Surveillance monitoring was performed at eight sites, and operational monitoring at one site. The monitoring program for lakes and ponds in the Dauguva RBD covers 33 water bodies. Surveillance monitoring for reference conditions was performed in ten lakes. Operational monitoring was performed in 23 lakes.

The monitoring network of river water bodies in the Venta RBD consists of 58 sites: surveillance monitoring was carried out at eight sites and operational monitoring at 50 sites. The monitoring program for lakes and ponds in the Venta RBD covers 20 water bodies. Surveillance monitoring was carried out in 12 lakes; operational monitoring was performed in eight ponds.

Figure 3.2 shows the proportion of water bodies in each ecological status/potential class that are included in surveillance monitoring in Lithuania. No data on surveillance monitoring of transitional and coastal waters were reported for Lithuania in WISE.

Figure 3.2 Proportion of water bodies in each ecological status/potential class that is included in surveillance monitoring in Lithuania



Source: WISE electronic reports

A differentiated presentation between ecological status and potential and including all types of quality element can be viewed here -
https://tableau.discomap.eea.europa.eu/t/Wateronline/views/WISE_SOW_QualityElement_Status_Compare/SWB_QualityElement_Group?iframeSizedToWindow=true&:embed=y&:display_count=no&:showAppBanner=false&:showVizHome=no

International surface water body monitoring

There are in total 36 rivers; nine lakes and two groundwater sites reported as part of the international network. No sites were indicated for the coastal waters. The Nemunas RBD has three neighbouring countries: Poland, Belarus and Russia. There are no reported sites with Russia. There are two sites reported with Belarus on the Nemunas and Neris rivers. Regarding Poland, there are five reported sites on lakes, two on rivers and two on groundwater bodies. Another three RBDs are international with Latvia where the highest numbers of international monitoring sites are reported: Venta RBD - seven rivers; Lielupe RBD – 22 rivers and one lake; Dauguva RBD – three lakes and three rivers. On RBMPs, each international site has been monitored and evaluated and information about ecological status was provided. An evaluation of each site on the basis of risk was provided.

Quality elements monitored (excluding River Basin Specific Pollutants)

Table 3.3 illustrates the quality elements used for monitoring of lakes and rivers for the second RBMPs; no differentiation is made between purposes of monitoring.

For the second RBMPs all relevant quality elements (biological, general physico-chemical and hydromorphological) were being monitored. The biggest part of all quality elements is monitored in rivers, which constitutes more than 75% of all monitoring sites.

Table 3.3 Quality elements monitored for the second RBMPs in Lithuania (excluding River Basin Specific Pollutants). NB - quality element may be used for surveillance and/or operational monitoring[8].

	Biological quality elements									Hydromorphological quality elements		
	Phytoplankton	Macrophytes	Phytobenthos	Benthic invertebrates	Fish	Angiosperms	Macroalgae	Other aquatic flora	Other species	Hydrological or tidal regime	River continuity conditions	Morphological conditions
Rivers	Yes	Yes	Yes	Yes	Yes	No	No	No		Yes	Yes	Yes
Lakes	Yes	Yes	Yes	Yes	Yes	No	No	No		Yes	No	Yes
Transitional	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes
Coastal	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes	Yes	No	Yes

	General physico-chemical quality elements							
	Transparency conditions	Thermal conditions	Oxygenation conditions	Acidification status	Nitrogen conditions	Phosphorus conditions	Silicate	Other deteminants for nutrient conditions
Rivers	No	Yes	Yes	Yes	Yes	Yes		
Lakes	Yes	Yes	Yes	Yes	Yes	Yes		
Transitional	Yes	Yes	Yes	Yes	Yes	Yes		
Coastal	Yes	Yes	Yes	Yes	Yes	Yes		

Source: WISE electronic reports

Annex V of the WFD provides guidance on the frequency of monitoring of the different quality elements. Surveillance monitoring should be carried out for each monitoring site for a period of one year during the period covered by a RBMP, i.e. six years. For phytoplankton, this should be done 6 times during the monitoring year and for other biological quality elements at least once during the year. Operational monitoring should take place at intervals not exceeding once every six months for phytoplankton and once every three years during the six-year cycle for the other biological quality elements. Greater intervals may be justified on the basis of technical knowledge and expert judgement.

[8] Lithuania subsequently informed that in the table some quality elements are not relevant for some water categories, i. e. angiosperms, macroalgae and other aquatic flora for river and lake, river continuity conditions for lake, transitional and coastal waters.

General physico-chemical parameters are monitored at all sites of activity monitoring rivers, measurements are performed every three months (four times a year). Hydrological parameters (flow and level) are monitored at the same intensity (four times a year), except for river areas affected by hydro power stations. In these river areas the hydrological regime is monitored 12 times a year (i.e. monthly). For rivers, the indicators of morphological conditions used were shoreline and bed structure, runoff size and nature, river integrity, river bed type, coastal vegetation condition and soil composition. With regards to lakes, the indicators of morphological conditions used were shore and soil structure, water level and exchange rate, shore condition, coastal vegetation condition, coastal erosion and soil composition.

For lakes, phytoplankton indicators are determined annually, consolidated from six measurements (during the phytoplankton vegetation period: April, May, July, August, September and October). Phytobenthos indicators are determined once a year. Concentrations of hazardous substances and specific pollutants are measured seven times per year. Indicators of biological elements, such as macrophytes, fish and benthic invertebrates are studied once every three years (two times in a six-year monitoring cycle). Once in a six-year monitoring cycle, morphological conditions are assessed and the water exchange rate is determined. Fish surveys are performed once every three years (two times during a six-year monitoring cycle). For rivers, the indicators of biological elements - bottom invertebrates, fish and phytobenthos are determined one per year in every three years, that means two times during a six-year monitoring cycle.

River Basin Specific Pollutants and matrices monitored

The monitoring of River Basin Specific Pollutants is a part of Monitoring programs of second RBMP. Information was reported at the site level on which specific chemical substances are monitored.

Member States were not asked explicitly to report in their electronic reports to WISE which specific River Basin Specific Pollutants had been identified or which ones are specifically monitored. The information on which River Basin Specific Pollutants are monitored in surface waters was obtained from the reported monitored chemical substances that are not Priority Substances. The River Basin Specific Pollutants reported were: oil hydrocarbons, metals (chromium (Cr), copper (Cu), vanadium (V), zinc (Zn), tin (Sn), arsenic (As) and aluminum (Al)).

Environmental quality standards have been developed only for water, and not for sediment or biota.

Annex V of the WFD provides guidance on the frequency of monitoring of the different quality elements: once every three months is recommended for “other pollutants” which are taken here to equate to River Basin Specific Pollutants. Surveillance monitoring should be carried out for each monitoring site for a period of one year during the period covered by a RBMP i.e. six years. For River Basin Specific Pollutants this should be done four times for the surveillance year, and for operational monitoring four times a year for each year of the cycle. Greater intervals may be justified on the basis of technical knowledge and expert judgement.

Overall, in Lithuania, River Basin Specific Pollutants were monitored at a frequency equal to or above the minimum frequency (four times per year) at most of sites.

Table 3.4 indicates River Basin Specific Pollutants reported in WISE as being monitored in one lake, 39 river, 15 transitional and five coastal sites. Despite some minor inconsistencies in the number of monitoring sites between different sources of information, and despite the inconsistencies between the number of substances reported to be monitored as River Basin

Specific Pollutants in WISE and the River Basin Specific Pollutants actually identified by Lithuania. There was a major improvement in the monitoring of River Basin Specific Pollutants compared to the first RBMPs, where these pollutants were not reported to be monitored.

Table 3.4 Number of sites used to monitor River Basin Specific Pollutants reported in the second RBMPs and non-priority specific pollutants and/or other national pollutants reported in the first RBMPs in Lithuania. NB - the data from both cycles may not be fully comparable as different definitions were used and also not all Member State reported information at the site level meaning that there were no equivalent data for the first RBMPs.

RBMPs		Lakes	Rivers	TeW	Transitional	Coastal
first	Sites used to monitor non-priority specific pollutants and/or other national pollutants	0	0	0	0	0
second	Sites used to monitor River Basin Specific Pollutants	1	39	8	15	5

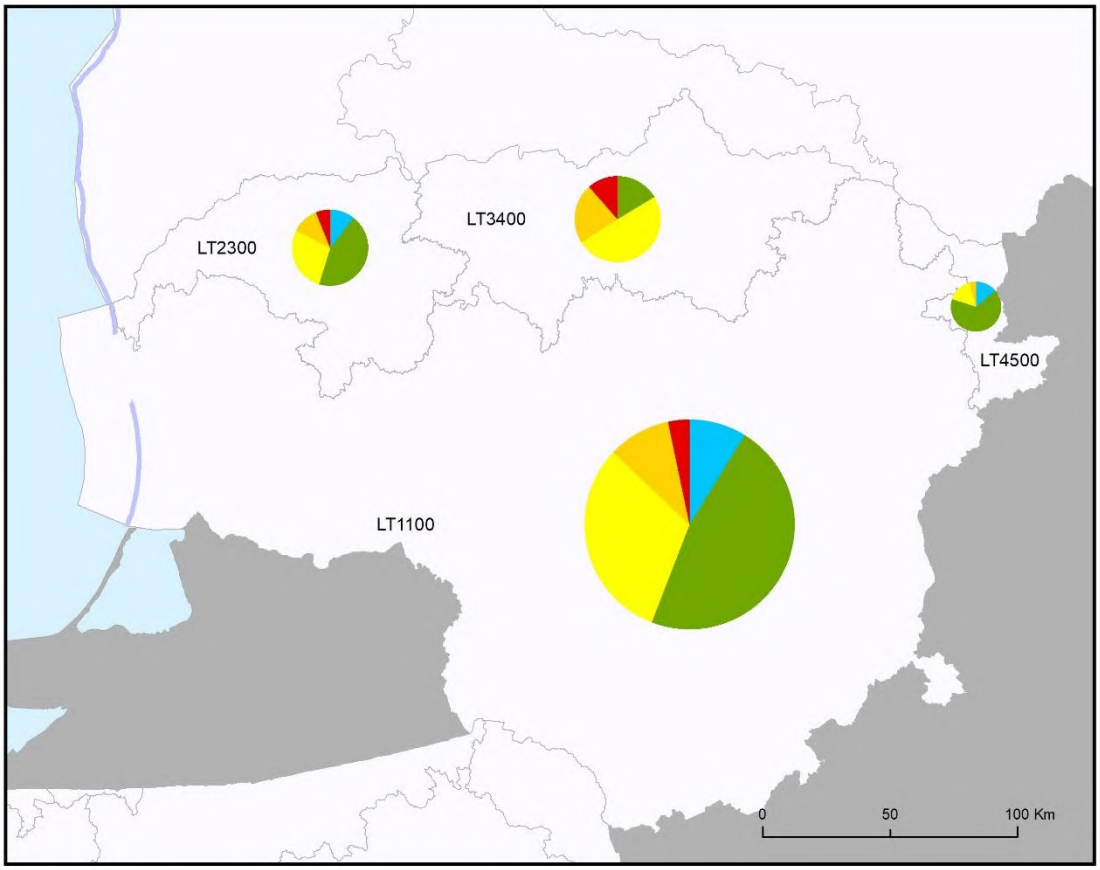
Source: WISE electronic reports

3.1.2 Ecological Status/potential of surface water bodies

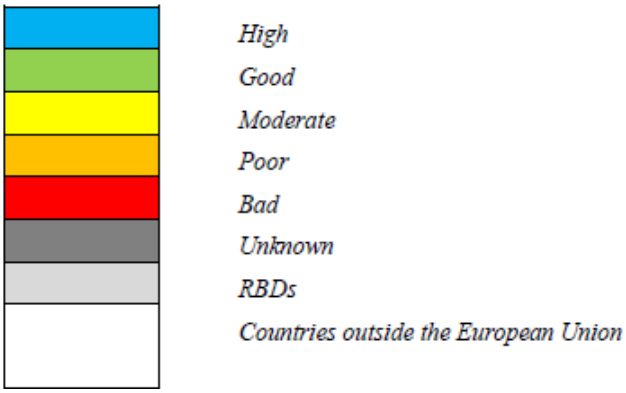
Overall water status and ecological status

All water bodies have been classified in the Lithuanian RBDs. The proportion of water bodies that do not meet the criteria of good status are reported to be 51% river bodies and 40% of lake bodies. Not all transitional and coastal water bodies meet the good status criteria. The overall distribution of ecological status/potential classes for all water categories combined is given for each RBD in Map 3.1. The proportion of water bodies in good or high status is almost the same in two RBDs (Nemunas and Venta), at about 50%, while it is higher (70%) in the Dauguva RBD, and lower (25%) in the Lielupe RBD.

Map 3.1 Ecological status or potential surface water bodies in Lithuania



Note: Standard colours based on WFD Annex V, Article 1(4)(2)(i)
Source: WISE, Eurostat (country borders)



A differentiated presentation of this data between ecological status and potential and including all types of quality element can be viewed here:
https://tableau.discomap.eea.europa.eu/t/Wateronline/views/WISE_SOW_QualityElement_Status_Compare/SWB_QualityElement_Group?iframeSizedToWindow=true&:embed=y&:display_count=no&:showAppBanner=false&:showVizHome=no

Confidence in ecological status assessment

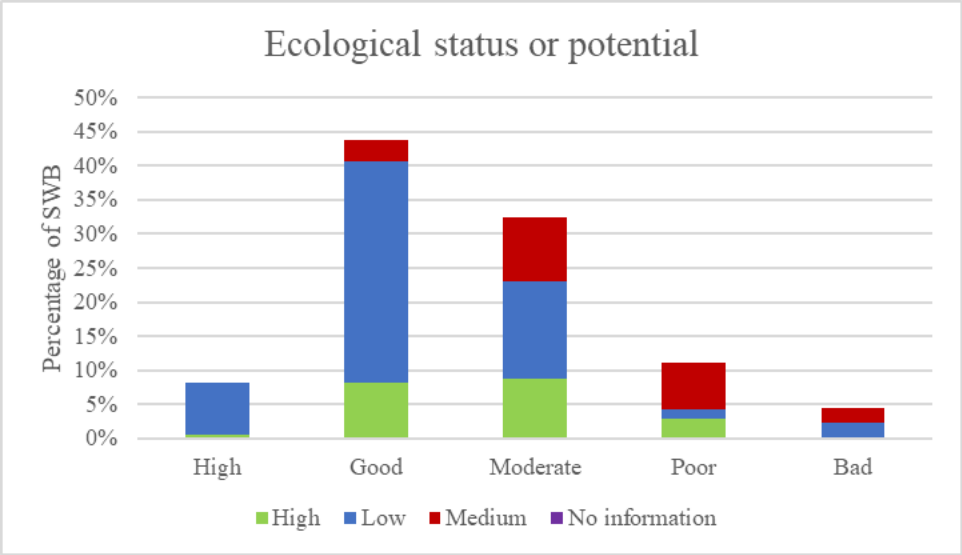
The confidence in classification of ecological status is given as high or medium for most lakes and coastal water bodies, but low for a larger proportion of river water bodies. It should be noted that

the confidence in classification is reported as low for most of the water bodies classified to be in good ecological status or potential, while the confidence is reported as high for most of the water bodies classified to be in moderate or poor ecological status or potential.

Information in the RBMPs indicated that the confidence of the status assessment is based on the quality of the data and the length of the period covered by the data, the spatial representativeness of the monitoring program and the variability of the results of the assessment of the different quality elements. The actual criteria used to assess confidence is described in the RBMPs.

No information has been found in the RBMPs concerning plans to improve the level of confidence and precision in the classification of ecological status. This creates uncertainly in particular for water bodies in good status, where the large majority has been assessed with low confidence.

Figure 3.3 Confidence in the classification of ecological status or potential of surface water bodies in Lithuania based on the most recently assessed status/potential

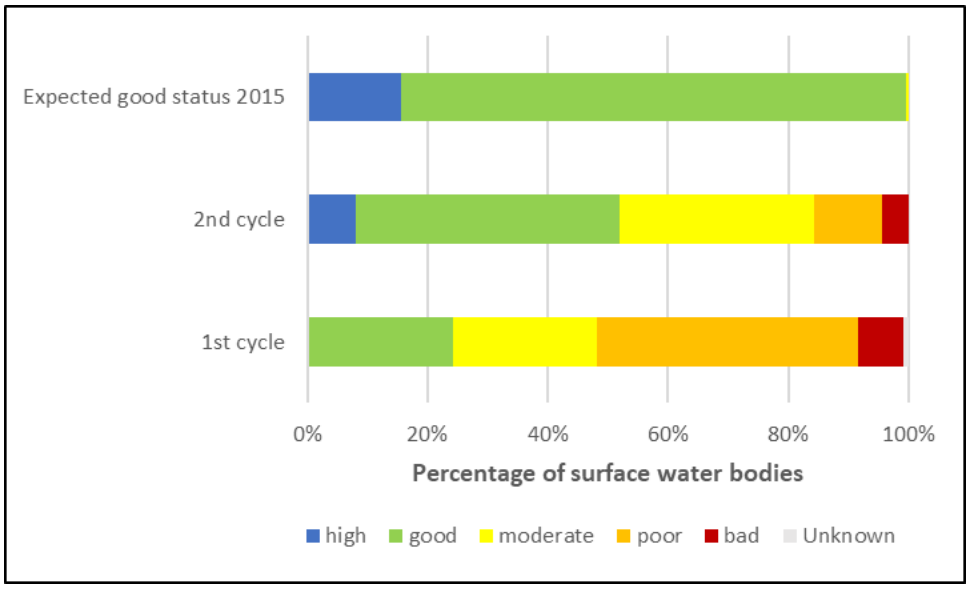


Source: WISE electronic reports

Ecological status change

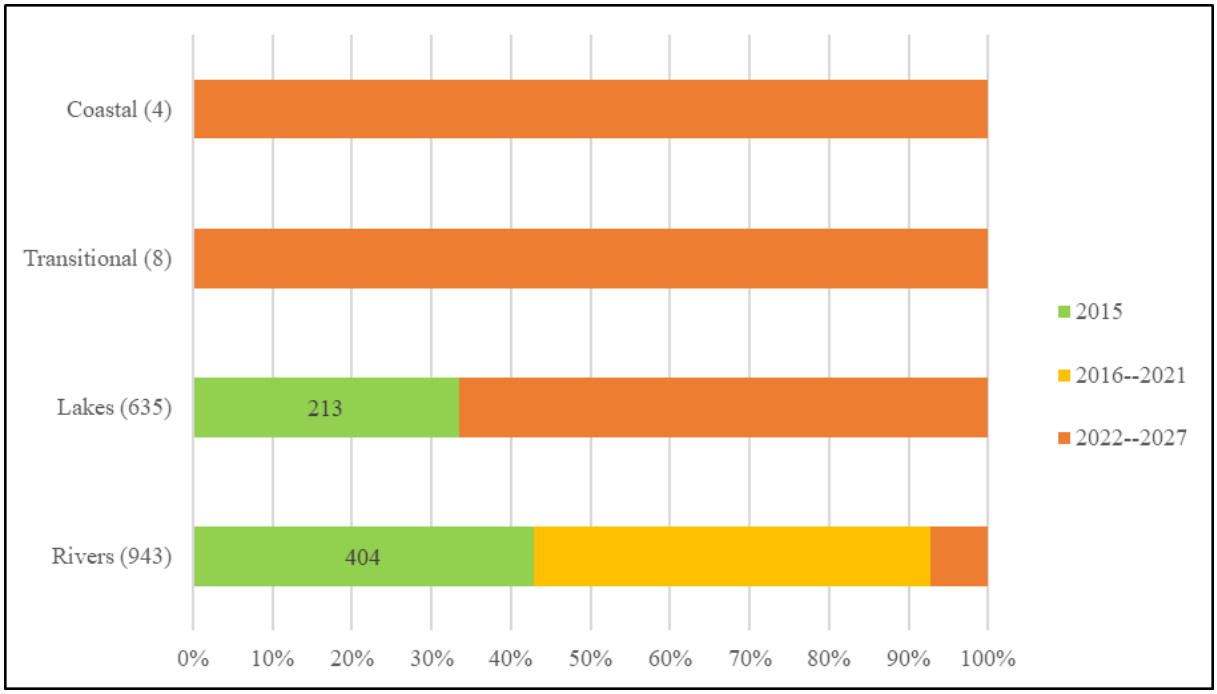
Figure 3.4 compares the ecological status of surface water bodies for the first RBMPs with that for the second RBMPs and that expected by 2015. A higher proportion of water bodies were classified as good in the second cycle. After elimination of point source pollution (through construction of domestic wastewater treatment plants), about 10% of water bodies have been classified as being of high quality.

Figure 3.4 Ecological status or potential of surface water bodies in Lithuania for the second RBMPs, for the first RBMPs and expected in 2015. The number in the parenthesis is the number of surface water bodies for each cycle. NB - the period of the assessment of status for the second RBMPs was [2010] to [2013]. NB. The period of the assessment of status for the second is not known but the 2nd RBMPs were adopted in 2017.



Source: WISE electronic reports

Figure 3.5 Expected date of achievement of good ecological status/potential of surface water bodies in Lithuania. The number in the parenthesis is the number of water bodies in each category



Source: WISE electronic reports

Classification of ecological status in terms of each classified quality element

Good or high status was reported for the majority of the water bodies classified for phytoplankton and benthic invertebrates in lakes, for phytobenthos, benthic invertebrates and macrophytes in rivers, and half of water bodies have been classified as good for phytoplankton in transitional waters. All quality elements are below good for coastal waters.

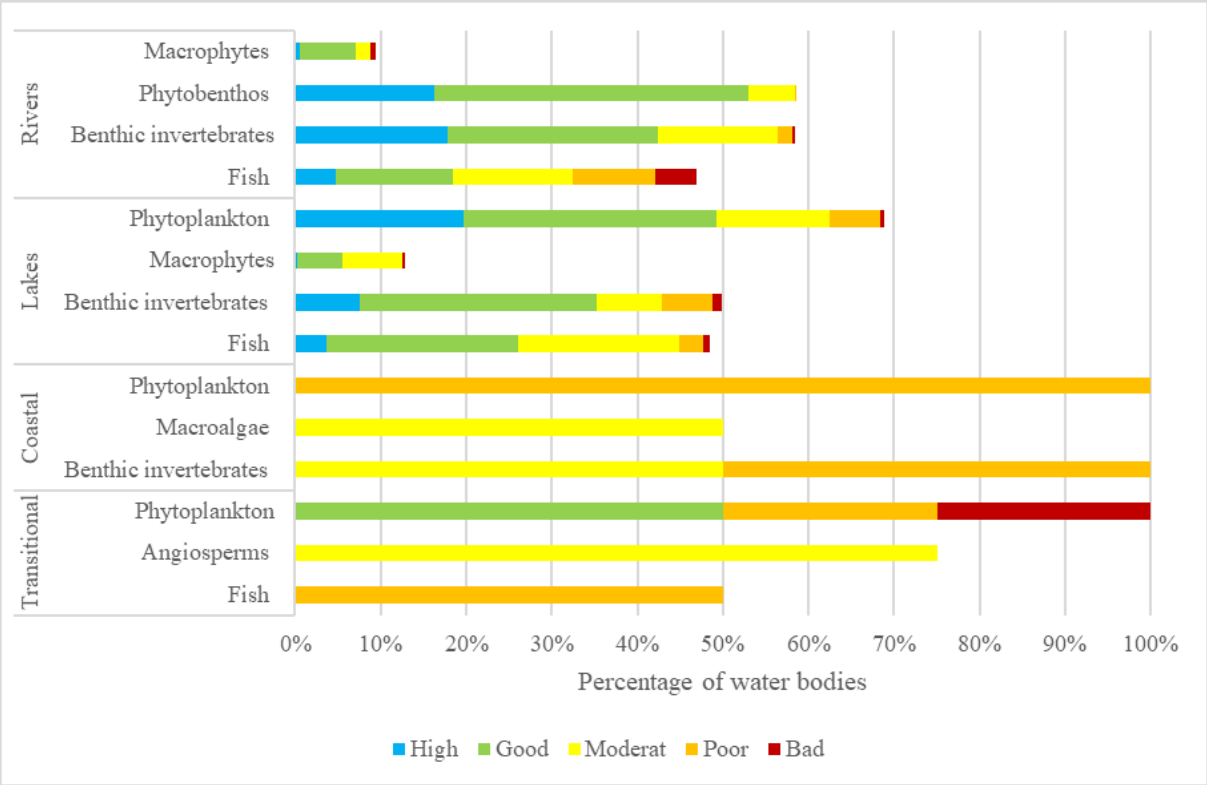
At the quality element level, only a few water bodies had a change in status/potential for a few quality elements, but there was no general pattern of change to better or worse status/potential since the first cycle.

Good or high status was reported for most of the water bodies classified for phytoplankton, macrophytes and nutrient conditions in lakes; for macrophytes, hydromorphological and physico-chemical quality elements in rivers[9].

At the quality element level, only a few water bodies had a change in status/potential for a few quality elements, but there was not a general pattern of change to better or worse status/potential. None of the changes were reported as being consistent. They were reported as being due to changes in monitoring and assessment methods.

Figure 3.6 shows the status of water bodies for each biological quality element used for classification. [10]

Figure 3.6 Ecological status/potential of the biological quality elements used in the classification of surface water bodies in Lithuania. NB - water bodies with unknown status/potential or those where the quality element was reported as not applicable or monitored but not used for classification are not presented.



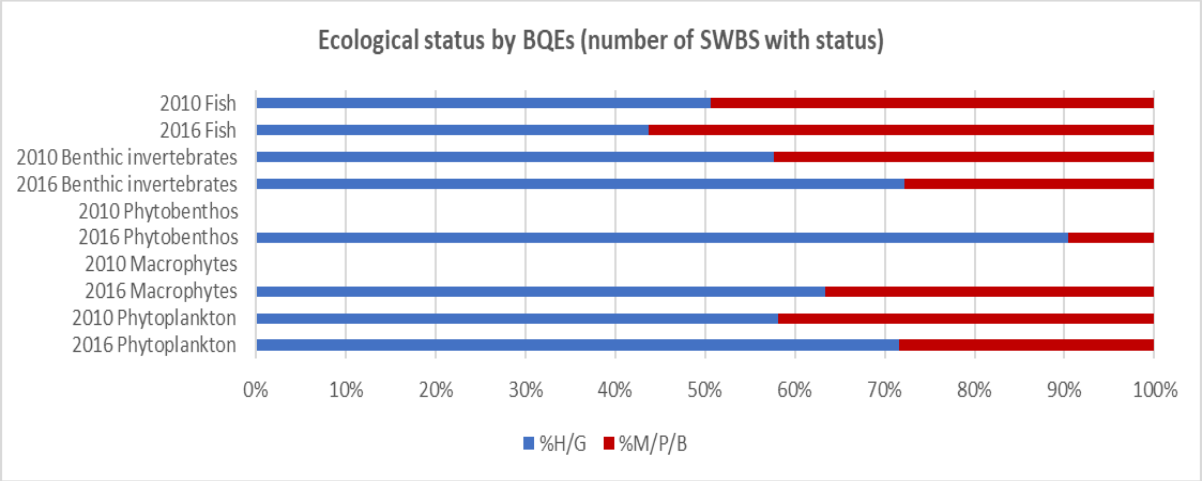
Source: WISE electronic reports.

[9] Lithuania subsequently informed that for benthic invertebrates are not good or high status in transitional and coastal waters.

[10] Lithuania subsequently informed that in Fig. 3.6. there is no benthic fauna indicated for the TW classification, while the information about good/high status of benthic fauna is provided in the paragraph above.

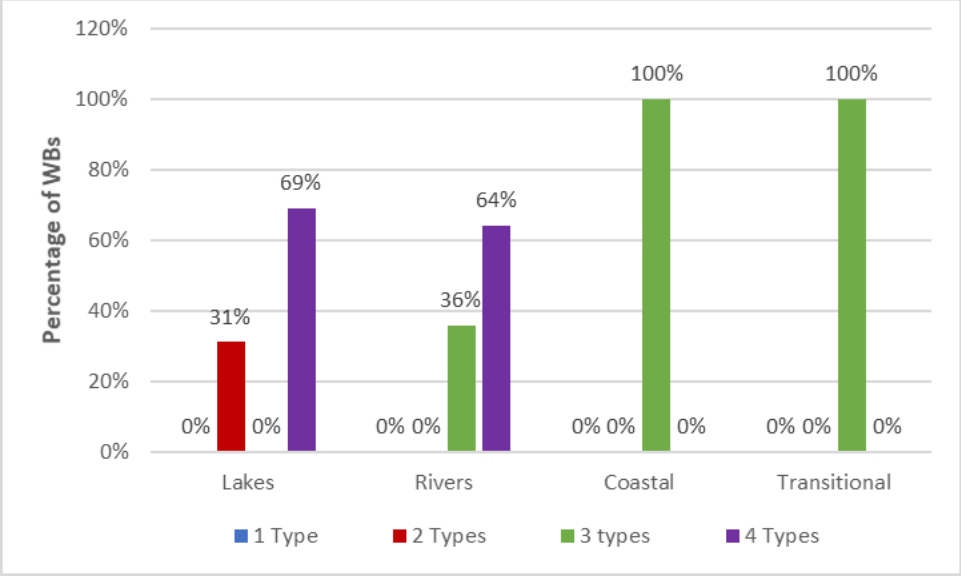
Figure 3.7 compares the classification of biological quality elements in terms of ecological status/potential for the two cycles. This comparison should be treated with caution as there are differences between the numbers of surface water bodies classified for individual elements and differences in methodologies from the first to the second RBMPs. Changes in the ecological status of the biological quality elements cannot be assessed due to differences in the data between the first and second RBMPs.

Figure 3.7 Comparison of ecological status/potential in Lithuania according to classified biological quality elements in rivers and lakes from the first to the second RBMPs



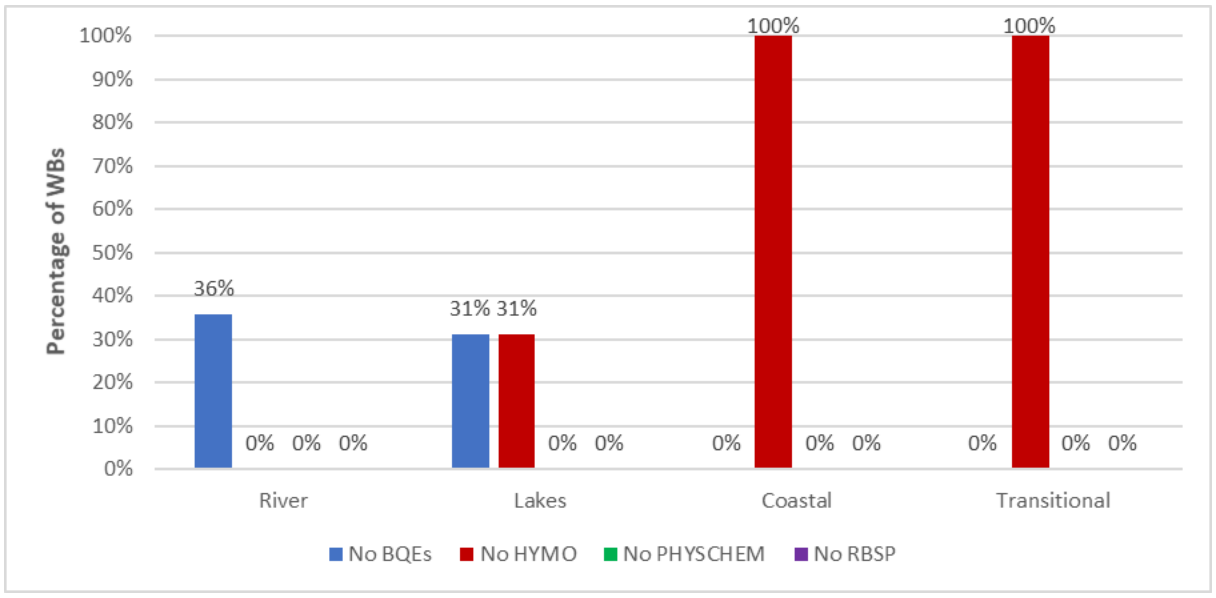
Source: WISE electronic reports

Figure 3.8 The classification of the ecological status or potential of surface waters in Lithuania using one, two, three or four types of quality element.



Source: WISE electronic reports

Figure 3.9 The percentage of surface water bodies in Lithuania where no biological quality elements (BQEs) or no hydromorphological (HYMO) or no general physico-chemical (PHYSCHEM) or no River Basin Specific Pollutant (RBSP) has been used in the classification of ecological status or potential



Source: WISE electronic reports

Figure 3.10 Basis of the classification of ecological status/potential in Lithuania. The percentages are in terms of all water bodies in each category.

Source: WISE electronic reports

Use of monitoring results for classification

Monitoring results were mostly used to classify rivers and lakes water bodies, but also for grouping some water bodies. Pollutants classified for lakes are only based on monitoring results. Expert judgment was used to classify proportionally more rivers water bodies in terms of each

quality element rather than using monitoring results. The classification of all quality elements for coastal and transitional waters was solely based on monitoring data.

Assessment methods and classification of biological quality elements

More methods for the assessment of the biological quality elements, including the establishment of reference conditions and definition of class boundaries, have been developed for all types in all water categories for the second RBMPs for the following biological quality elements: macrophytes, phytobenthos and fish in rivers, macrophytes and benthic invertebrates in lakes, and benthic invertebrates in coastal and transitional waters.
Lithuania subsequently informed that new WFD method on benthic fauna has been tested for both transitional and coastal waters, however, only for the coastal waters the method was approved nationally and at the EU level (EC decision 2018/229).

However, still some gaps in the methods for phytobenthos and angiosperms in transitional and coastal waters.
Lithuania subsequently informed that there were gaps for lake phytobenthos and very large river phytoplankton. At present, all biological methods have been developed and adapted, method reference values have been established, and intercalibration has been harmonized and completed, with the exception of very large river phytobenthos and fish testing methods. Very large rivers phytobenthos is going to be intercalibrated and result will be provided in 3rd RBDMP, intercalibration of very large rivers fish is ongoing in EU common working group

The sensitivity of methods to significant impacts is reported for the different biological quality elements: the method for phytoplankton is sensitive to nutrients and temperature; macrophytes and phytobenthos to nutrients and organic pollution; benthic invertebrates to nutrients, organic pollution, hydrological impact, and morphological impact; and fish to chemical pollution, temperature and hydromorphological impacts.

Intercalibration of biological quality element methods

Some of the national types are linked to a common intercalibration type. No explicit information has been provided in the RBMPs or background documents regarding the approach used to translate the results from the common intercalibrated types to other national types. There are also some mismatches between certain typology factors for the national types and the intercalibration types to which they are linked, such as humic substances and size for rivers. According to the RBMPs and background documents, biological methods for macrophytes and fish in rivers have not yet been intercalibrated[11].

Assessment of hydromorphological quality elements

Hydrological conditions are monitored in some rivers and lakes. According to the RBMPs, the reference conditions for the hydromorphological assessment methods are not properly linked to the sensitive biological quality elements in a number of water bodies assumed to be in reference conditions. The morphological conditions of waters bodies are reported to be assessed in terms of

[11] Lithuania subsequently informed that all national types of river and lake are linked to the common intercalibration types. The links were adopted and transposed in to commission decision (EU) 2018/229. Biological methods for macrophytes and fish in rivers have been intercalibrated. However phytobenthos of very large rivers was not intercalibrated yet, but is going to be intercalibrated in view of the thir cycle of RBMP. Intercalibration of fish in very large river is ongoing under the WFD Common Implementation Strategy.

ecological status/potential and the classification boundaries are related to the class boundaries for the sensitive biological quality elements. River continuity is assessed in terms of ecological status/potential and the classification boundaries are reported to be related to the class boundaries for the sensitive biological quality elements.

Classification methods for physico-chemical quality elements

Nutrient and oxygenation conditions are assessed in terms of ecological status/potential for lake and river water categories and the classification boundaries are related to the class boundaries for the sensitive biological quality elements. The same applies to transparency conditions and phytoplankton for transitional and coastal waters.

Physico-chemical standards were set for all general physico-chemical quality elements for all water categories required by the WFD. The RBMP states that threshold values for the general physico-chemical parameters were changed following an Order of the Minister of the Environment of 2010 on the method of classification of the surface water bodies. The standards for general physico-chemical quality elements have not the same range of values for all water categories and not for all types. The nutrient standards for total phosphorus are close to the saturation level for nutrient sensitive biological quality elements (up to 0.14 milligrams per litre for Total-phosphorus and up to 2.3 milligrams per litre for nitrate).

Selection of River Basin Specific Pollutants and use of Environmental Quality Standards

There is detailed information in the RBMPs on how River Basin Specific Pollutants have been identified.

The information on how the River Basin Specific Pollutants were used in the overall classification of ecological status has been provided. According to the WFD, River Basin Specific Pollutants are used to assess the ecological status of water bodies andtherefore the values of good and less than good ecological status have been established as the expression of annual average concentrations and are applicable at a national scale.

The analytical methods used for all of the 25 substances for which standards have been set meet the minimum performance criteria laid down in Article 4.1 of the QA/QC Directive (2009/90/EC) for the strictest standards applied.

Overall classification of ecological status ('one-out all-out' principle)

Lithuania reported that the 'one-out all-out' principle was used. The details of the combination rules for the different groups of quality elements were reported.

3.2 Main changes in implementation and compliance since the first cycle

More methods for the assessment of the biological quality elements have been developed for the second RBMPs, including methods to monitor macrophytes, phytobenthos and benthic invertebrates in rivers, macrophytes, phytoplankton and benthic invertebrates in lakes, and benthic invertebrates in coastal and transitional waters.

The monitoring of River Basin Specific Pollutants was a major improvement compared to the first RBMPs, where these pollutants were not reported to be monitored. The majority of river and lakes are however assessed for River Basin Specific Pollutant using expert judgement.

During the second RBMPs, the number of water bodies in good ecological status increased in all water categories and in all RBDs. The proportion of surface water bodies expected to achieve good status/potential after 2015 has increased from 20% in the first RBMPs to 50% in the second RBMPs.
For transitional and coastal waters there has been no change, as all of the water bodies were and still are in less than good status/potential.

In Lithuania, there were significant increases in the number of monitoring sites from the first to the second RBMPs - 289 to 357 sites in lakes and 436 to 578 sites in rivers. An increase of monitoring sites was indicated in all RBMPs.

3.3 Progress with Commission recommendations

The Commission recommendations based on the first RBMPs and PoM requested action on the following:

- Recommendation: *The identification of River Basin Specific Pollutants needs to be more transparent, with clear information on how pollutants were selected, how and where they were monitored, where there are exceedances and how such exceedances have been taken into account in the assessment of ecological status. It is important that there is an ambitious approach to combatting chemical pollution and that adequate measures are put in place.*

  Assessment: The list of River Basin Specific Pollutants and values of Environmental Quality Standards were established during preparation of the second RBMPs. It is necessary to point out that in Lithuania the possibilities for setting annual average Environmental Quality Standards for specific pollutants is limited. The average annual Environmental Quality Standard for specific pollutants in Lithuanian surface waters were determined according to analogous situations in other countries, where an Environmental Quality Standard was set in accordance with requirements of Annex 5 of WFD. River Basin Specific Pollutants are monitored in surface water bodies and are included in the assessment of the ecological status of Lithuanian rivers, lakes, transitional and coastal waters. The ecological status of rivers, lakes, transitional and coastal waters is assessed according to the following indicators (heavy metals): aluminium (Al), arsenic (As), chromium (Cr), copper (Cu), vanadium (V), zinc (Zn) and tin (Sn). According to the annual average values of River Basin Specific Pollutants, the water body is assigned to one of the two ecological status classes (good or failing to achieve good). The second RBMPs claims that analysis of surface water bodies monitoring results showed that status of three river water bodies did not meet the good ecological status in terms of River Basin Specific Pollutants (Zn and Al). In one case, the copper concentration (5.17 µg/l) has slightly exceeded the Environmental Quality Standard value (≥5 µg/l) in the northern part of the Curonian Lagoon (transitional water body). No other exceedances have been found. Therefore, these recommendations have been partially fulfilled.

- Recommendation: *Monitoring, method development and assessment of ecological status for transitional and coastal waters needs to be continued, together with the detailed further steps that will be identified through the next phase of the inter-calibration process. Good monitoring programmes that can pick up pressures will ultimately lead to more targeted cost-effective PoMs. It is furthermore not clear if the monitoring programme reported in the RBMPs is the programme used for these RBMPs, so more transparent information is needed in the RBMPs on the monitoring programmes.*

Assessment: There has been some progress, as some of the gaps in the monitored quality elements identified in the first RBMPs have been fulfilled for the second RBMPs. However, there are still significant gaps in the biological quality elements monitored in the different water categories in Lithuania. More biological quality element assessment methods have been developed for the second RBMPs: for macrophytes, phytobenthos and fish in rivers; macrophytes and benthic invertebrates in lakes; and benthic invertebrates in coastal and transitional waters. The RBMPs reported that investigative monitoring in the basin areas for transitional and coastal waters is planned. This will help provide an overview of the water body and the pressures, after which further steps can be taken to improve the status of the water body to good. The second RBMP presents a status of the transitional and coastal waters based on data of 2010-2013, which have been collected by implementing both the national monitoring programme for the period 2005-2010 and the national monitoring programme for the period 2011-2017. The monitoring programme for the period of 2018-2023 has been reported in the second RBMP. Progress has been made on these recommendations, and they are partially fulfilled.

- Recommendation: *Set up the missing reference conditions for the second RBMPs.*

Assessment: The requite reference conditions for all biological elements, hydromorphological and physico-chemical quality elements reference conditions were set. Reference conditions for lake phytobenthos and very large river phytoplankton are still needed to specify. This recommendation has therefore almost fulfilled.

- Recommendation: *Report transparently in the second RBMPs on what load reduction of nutrients is necessary to reach nutrient conditions consistent with good status and devise measures to implement the reduction.*

Assessment: A set of nation-wide measures, targeting agricultural pollution, has been included in the RBMPs. RBMPs contain compromise measures which were possible to agree at a political and stakeholder level. However, these measures are not enough, as in some rivers nutrients load was increased from first cycle. This recommendation has therefore been partially fulfilled.

Topic 4 Monitoring, assessment and classification of chemical status in surface water bodies

4.1 Assessment of implementation and compliance with WFD requirements in the second cycle

4.1.1 Monitoring of chemical status in surface waters

Monitoring sites and monitored water bodies used for monitoring of chemical status

For the assessment of ecological status/potential and chemical status, Member States have to implement surveillance and operational monitoring programmes in accordance with the requirements of the WFD and of the EQS Directive.

Surveillance monitoring programmes should allow Member States to supplement and validate the impact assessment procedure, to efficiently and effectively review the design of their monitoring programmes, and to assess the long-term changes in natural conditions and those resulting from widespread anthropogenic activity. For operational purposes, monitoring is required to establish the status of water bodies identified as being at risk of failing to meet their environmental objectives, and to assess any changes in the status of such water bodies resulting from the PoM.

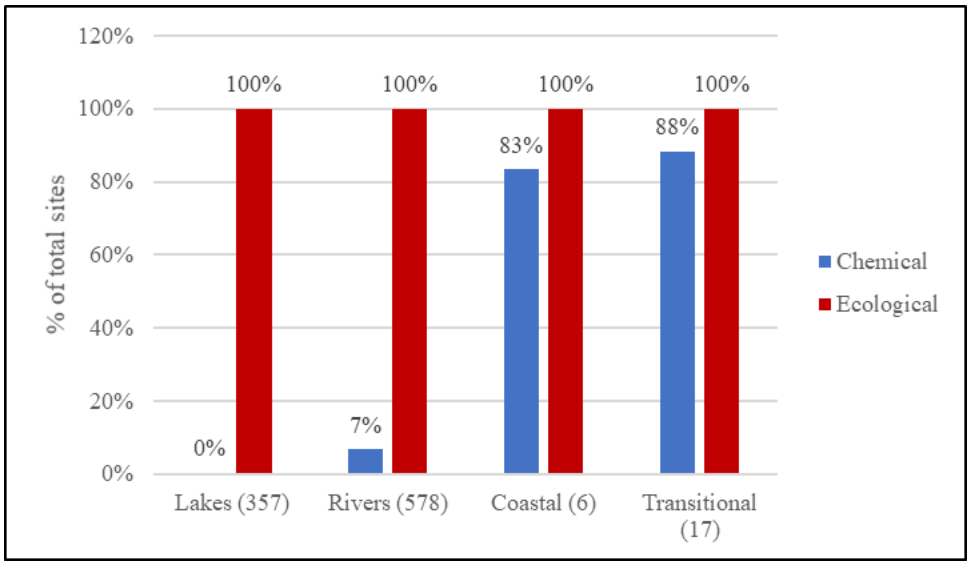
Section 3.1.1 of this report summarises the characteristics of the surveillance and operational monitoring programmes in Lithuania for the second RBMP.

Figure 4.1 summarises the proportion of sites used for the monitoring of chemical status in lakes and rivers for the second RBMP. In this figure, no distinction is made between sites used for surveillance and/or operational purposes. More detailed information can be found on the website of the European Environment Agency[12].

All monitoring sites are used for assessment of ecological status (100% of sites for lakes, rivers, territorial and coastal waters) with a considerably lower proportion of sites used for monitoring of chemical status (0%, 7%, 83% and 88% of sites for lakes, rivers, territorial and coastal waters, respectively). However, the lower proportion identified here is likely to be the result of a reporting mistake.

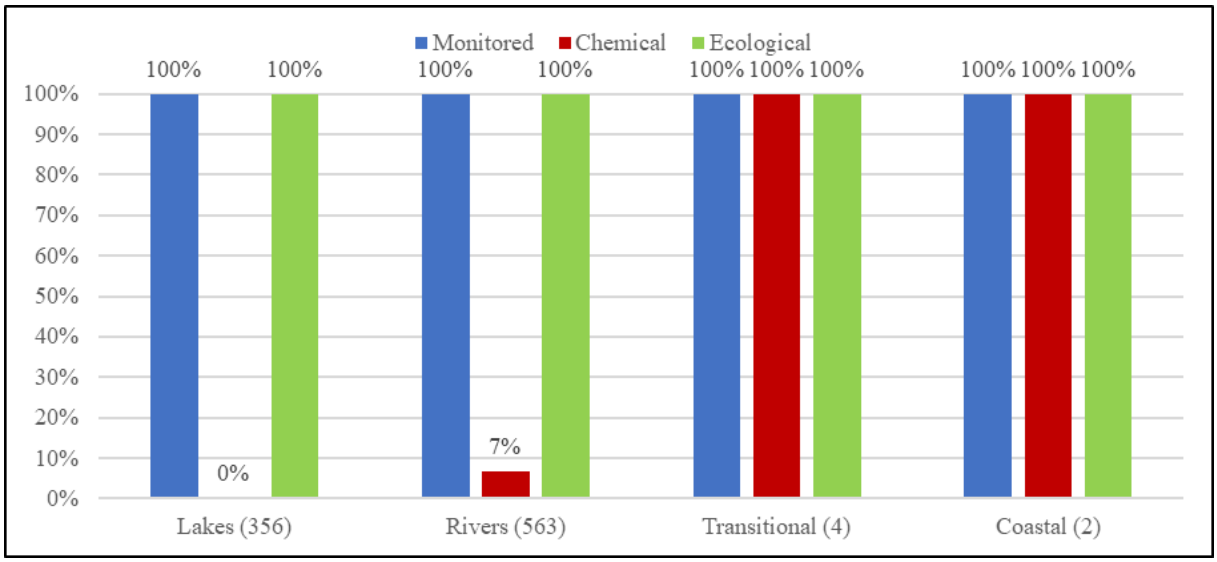
Figure 4.1 Proportion of sites used for monitoring of chemical status and, for comparison, ecological status, in Lithuania. The number in parenthesis next to the category is the total number of monitoring sites irrespective of their purpose

[12] https://www.eea.europa.eu/publications/state-of-water.



Source: WISE electronic reports

Figure 4.2 Proportion of total water bodies in each category which are monitored for chemical status and for ecological status, in Lithuania. The number in parenthesis next to the category is the total number of water bodies in that category



Source: WISE electronic reports

Long-term trend monitoring and monitoring of Priority Substances in water, sediment and biota for status assessment

Monitoring for status assessment

Requirements

Article 8(1) of the WFD requires Member States to establish monitoring programmes in order to provide *inter alia* a coherent and comprehensive overview of water status within each RBD. The amount of monitoring undertaken in terms of Priority Substances, frequency and number of sites should be sufficient to obtain a reliable and robust assessment of status. According to the EQS Directive (version in force in 2009), mercury, hexachlorobenzene and hexachlorobutadiene have

to be monitored in biota for status assessment, unless Member States derived a standard for another matrix, which is at least as protective as the biota standard.

Spatial coverage

Lithuania reported that 40 Priority Substances are monitored to variable extents (monitoring frequencies are reported for 40 Priority Substances at site level) with the majority of these substances being monitored in water. In the Nemunas and Venta RBDs, all 40 Priority Substances were monitored. In the Lielupe RBD, 24 Priority Substances were monitored. No Priority Substances were monitored in Dauguva RBD.

Mercury, hexachlorobenzene and hexachlorobutadiene are monitored in biota in the Nemunas (15 water bodies of all types), For Venta and Lielupe RBDs these Priority Substances are montitored in one river water body each, while in the the Daugava RBD they are not monitored in any surface water body.

Frequencies

The WFD indicates that, for the surveillance and operational monitoring of Priority Substances in water, the frequency of monitoring should be at least monthly for one year during the RBMP cycle and at least monthly every year, respectively. Monitoring in biota for status assessment should take place at least once every year according to the EQS Directive. In all cases greater intervals can be applied by Member States if justified on the basis of technical knowledge and expert judgement.

Monitoring frequencies were reported for 40 Priority Substances at site level in all the RBDs apart from the Dauguva RBD. Monitoring frequencies ranged from one to 12 times per year, and from once per cycle to every year.

Monitoring for long-term trend assessment

Requirements

Article 3(3) of the EQS Directive (version in force in 2009) requires Member States to monitor 14 Priority Substances[13] that tend to accumulate in sediment and/or biota, for the purpose of long-term trend assessment. Monitoring should take place at least once every three years, unless technical knowledge and expert judgment justify another interval.

Spatial coverage

In the Nemunas RBD, 12 of the 14 relevant substances were monitored in sediment in 37 water bodies (all types of water bodies). In the Venta RBD, 12 of the 14 relevant substances were monitored in sediment in two rivers water bodies. The Lielupe RBD monitored seven of the 14 relevant substances in sediment in one river water body. Relevant substances in sediment were not monitored in the Dauguva RBD.

[13] Anthracene, brominated diphenylether, cadmium, C10-13 chloroalkanes, DEHP, fluoranthene, hexachlorobenzene, hexabutadiene, hexachlorocyclohexane, lead, mercury, pentachlorobenzene, PAH, Tributyltin.

Also, in these RBDs, six of the 14 substances were monitored in biota in 14 water bodies and one coastal water body. Monitoring for long-term trend assessment was undertaken in territorial waters and lakes as well.

Monitoring of biota is undertaken between one and three times per year and from at least once to three times per cycle. Monitoring of sediment is undertaken between one and two times per year and from at least once to three times per cycle.

Monitoring of Priority Substances that are discharged in each River Basin District

Annex V of the WFD states, in Section 1.3.1 (Design of surveillance monitoring), that 'Surveillance monitoring shall be carried out for each monitoring site for a period of one year during the period covered by a river basin management plan for [*inter alia*]: priority list pollutants which are discharged into the river basin or sub-basin.' Section 1.3.2 (Design of operational monitoring) of the Directive states that 'In order to assess the magnitude of the pressure to which bodies of surface water are subject Member States shall monitor for those quality elements which are indicative of the pressures to which the body or bodies are subject. In order to assess the impact of these pressures, Member States shall monitor as relevant [*inter alia*]: all Priority Substances discharged, and other pollutants discharged in significant quantities.'

Member States are therefore required to monitor all Priority Substances which are discharged into the river basin or sub-basin.

In all RBDs in Lithuania, 40 Priority Substances are included in inventories.

Performance of analytical methods used

The analytical methods used for all Priority Substances are reported to meet the minimum performance criteria laid down in Article 4(1) of the QA/QC Directive (2009/90/EC) for the strictest standard applied. The method of dealing with measurements of Priority Substances lower than the limit of quantification is as specified in Article 5 of the QA?QC Directive.

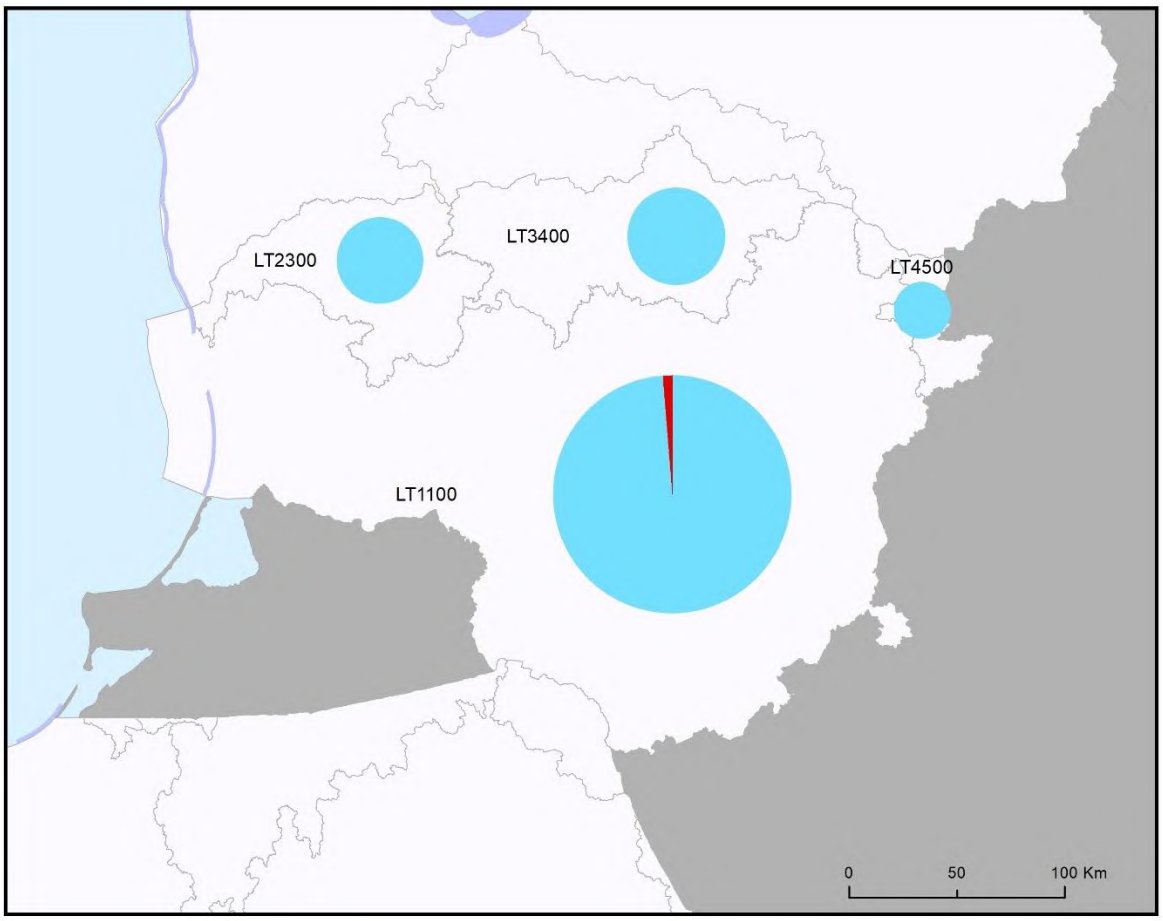
4.1.2 Chemical Status of surface water bodies

Member States are required to report the year on which the assessment of chemical 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.

The chemical status of surface water bodies in Lithuania for the second RBMPs is illustrated in Map 4.1. This is based on the most recent assessment of status. In Lithuania, 99% of all surface water bodies were at good chemical status, 1% were failing to achieve good status and 0% were classified as unknown. All coastal and transitional water bodies were failing to achieve good status, although it should be appreciated that these water bodies are few in number: two for coastal and four for transitional.

Concentrations of hazardous substances are monitored only in river areas where good chemical status may not be achieved due to these elements, with monthly measurements (12 times per year) and once a year in bottom sediments.

Map 4.1 Chemical status of surface water bodies in Lithuania based on the most recently assessed status of the surface water bodies
Note: Standard colours based on WFD Annex V, Article 1.4.3



Source: WISE, Eurostat (country borders)

Good
Failing to achieve to good
Unknown
River Basin Districts
Countries outside the EU

Table 4.1 Chemical status of surface water bodies in Lithuania for the second and first RBMP. NB1 - the number in parenthesis next to the water category is the number of water bodies. NB2 - Chemical status assessment is based on the standards laid down in the EQS Directive (as amended by Directive 2013/39/EU). Some Member States did not implement the Directive in the first RBMPs as the transposition deadline was in July 2010, after the adoption of the first RBMPs.

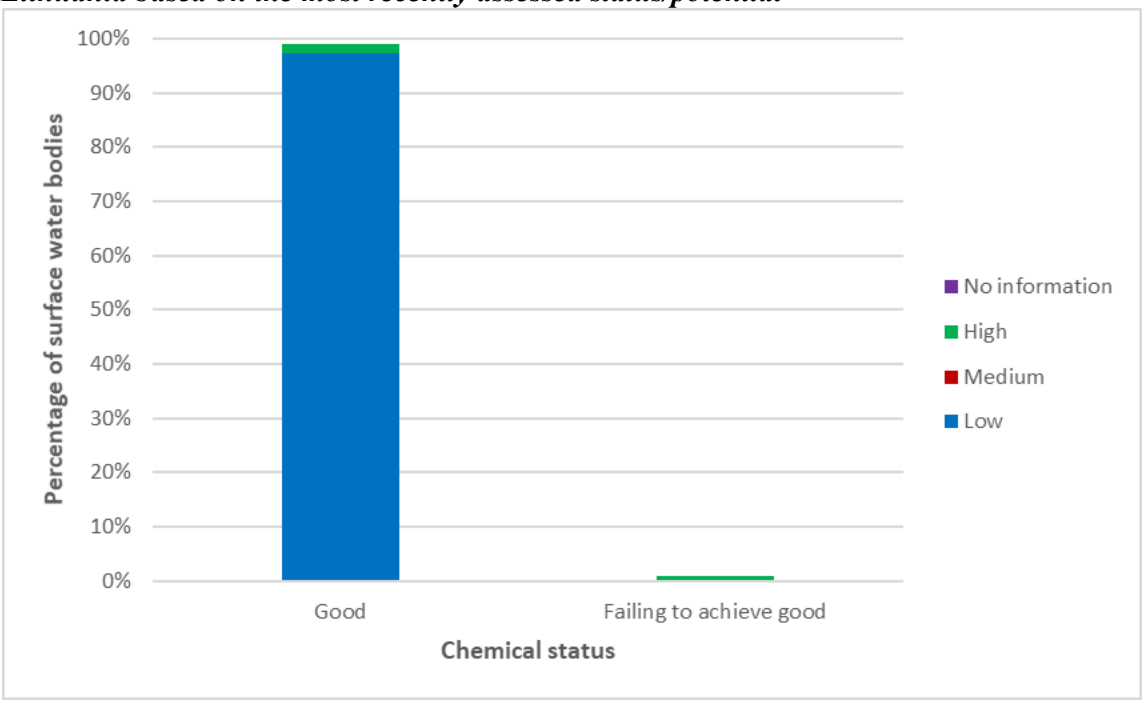
Category	Good		Failing to achieve good	
	Number	%	Number	%
Second RBMP				
Lakes (357)	356	100%	1	0%
Rivers (822)	817	99%	5	1%

Category	Good		Failing to achieve good	
	Number	%	Number	%
Coastal (2)	0	0%	2	100%
Transitional 4	1	25%	3	75%
Total (1185)	1174	99%	11	1%
First RBMP				
Lakes (345)	345	100%	0	0%
Rivers (832)	819	98%	13	2%
Coastal (2)	2	100%	0	0%
Transitional (4)	3	75%	1	25%
Total (1183)	1169	99%	14	1%

Source: WISE electronic reports

Figure 4.3 shows the confidence in the classification of chemical status for the second RBMPs. Overall, all water bodies in good status were classified with medium confidence. A significant number of water bodies are currently in unknown status. Confidence in the classification of chemical status for the first RBMPs was not reported.

Figure 4.3 Confidence in the classification of chemical status of surface water bodies in Lithuania based on the most recently assessed status/potential



Source: WISE electronic reports

Classification of chemical status is intended to be assessed according to the 'one-out all-out' principle. This means that the failure of one Priority Substance Environmental Quality Standard in a water body results in failure to achieve good status classification for that water body in Lithuania.

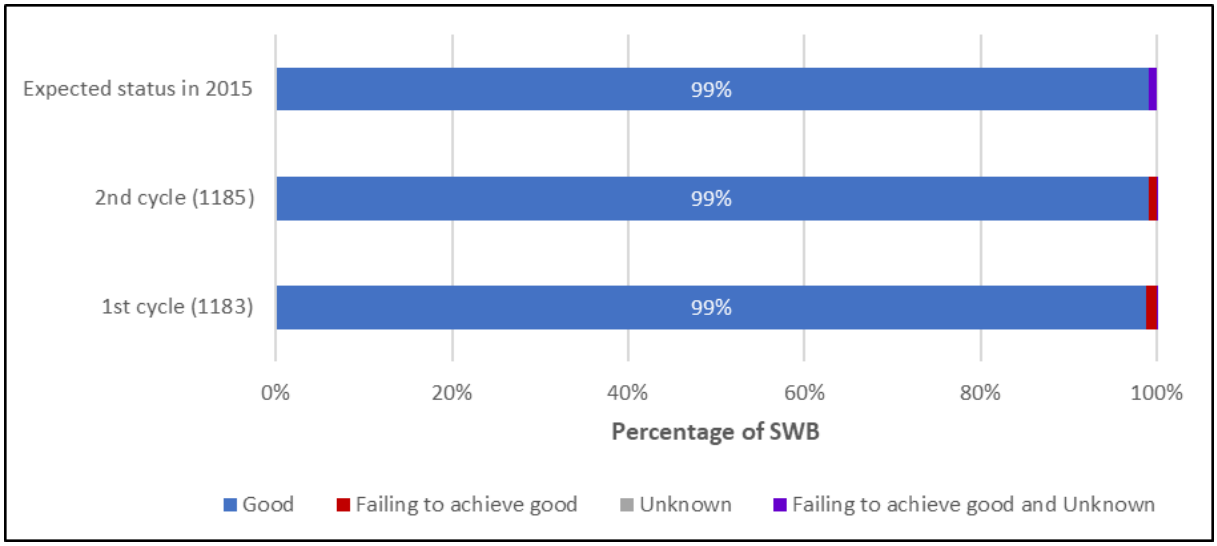
Figure 4.4 compares the chemical status of surface water bodies in Lithuania for the first RBMPs with the second RBMPs (based on the most recent assessment of status) and that expected by 2015. There is very litlle difference in the proportion of water bodies with good status in the second RBMP and that expected by 2015.

There were no differences in the proportion of surface water bodies with good chemical status between first and second RBMPs. 99% of surface water bodies are in a good chemical status.

Due to the concentrations of hazardous substances that exceeded the environmental quality standards, only six river and lake water bodies in the Nemunas RBD failed to meet the requirements of good chemical status. In the first RBMPs, 19 surface water bodies failed meet good chemical status.

The assessment of chemical status for the second RBMPs was expected to be based on the standards laid down in the EQS Directive (version in force on 13 January 2009). Some Member States did not implement the Directive in the first RBMPs as the transposition deadline was in July 2010, after the adoption of the first RBMPs.

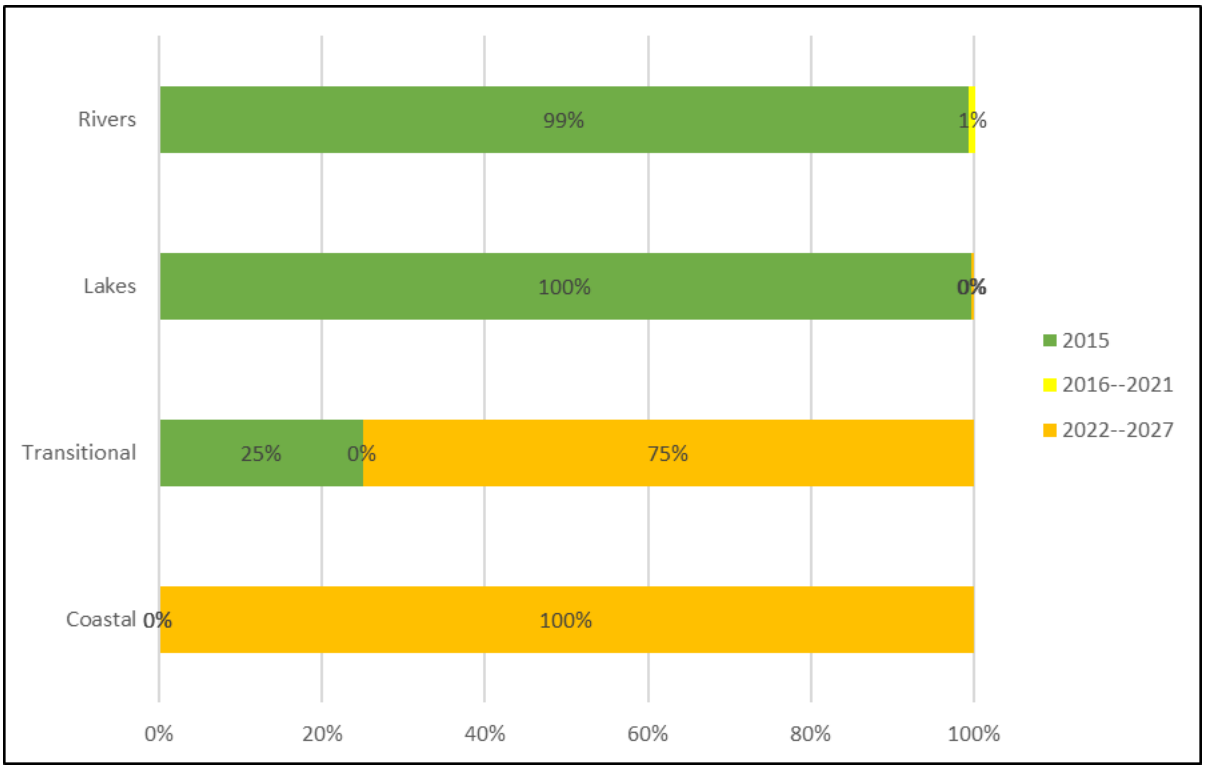
Figure 4.4 Chemical status of surface water bodies in Lithuania for the second RBMP, for the first RBMP and expected in 2015. The number in the parenthesis is the number of surface water bodies for both cycles. NB - the period of the assessment of status for the second is not known but the 2nd RBMPs were adopted in 2017.



Source: WISE electronic reports

Member States were asked to report the expected date for the achievement of good chemical status. The information is shown in Figure 4.5. All lakes and territorial waters, about 100% of rivers and lakes, and 25% of transitional waters were expected to be at good chemical status by the end of 2015. Coastal and transitional water bodies are only expected to reach good status by 2027.

Figure 4.5 Expected date of achievement of good chemical status of surface water bodies in Lithuania. The number in the parenthesis is the number of water bodies in each category



Source: WISE electronic reports

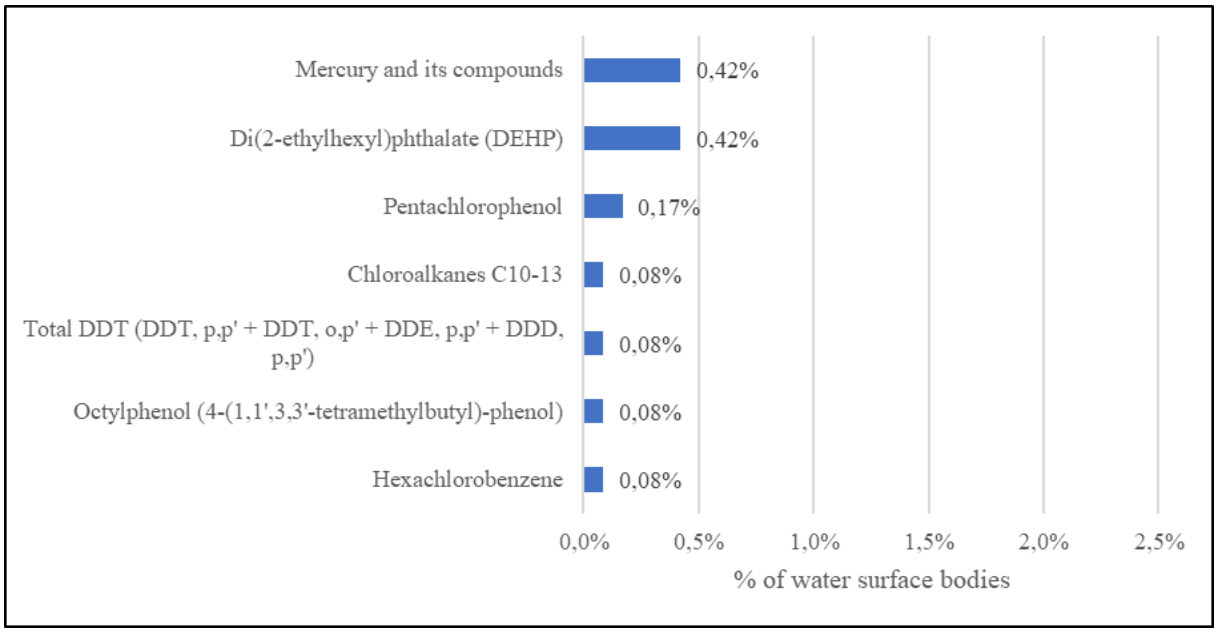
Priority Substances causing failure of good chemical status

Member States were expected to report exceedances for individual substances on the basis of the revised, more stringent standards from Directive 2013/39/EU.

The substances causing the greatest number of water bodies to fail good chemical status were mercury and its compounds, Di(2-ethylhexyl)phthalate (DEHP) and pentachlorophenols.
The seven substances that were the cause of a failure to achieve good chemical status are shown in Figure 4.6.

No Priority Substances are reported to have improved from failing to achieve good status to good chemical status since the first RBMPs.

Figure 4.5 The seven Priority Substances causing failure to achieve good chemical status in surface water bodies in Lithuania



Source: WISE electronic reports

Ubiquitous persistent, bioaccumulative and toxic Priority Substances

According to article 8(a) of the EQS Directive[14], eight Priority Substances and groups of Priority Substances are behaving like ubiquitous, persistent, bioaccumulative and toxic substances[15]. These substances are generally expected to cause widespread exceedances, and their emissions can be challenging to tackle (e.g. due to long-range atmospheric transport and deposition). In order to show the progress made in tackling other Priority Substances, Member States have the possibility to present the information related to chemical status separately for these substances.

When all 40 Priority Substances are taken into account, about a quarter of water bodies are failing to achieve good chemical status, however this falls to a few percent when the ubiquitous, persistent, bioaccumulative and toxic substances are omitted. This is illustrated in the 2018 State of Water report of the European Environment Agency[16]. The absence of monitoring in biota may underestimate the impact of this substance on the chemical status.

Priority Substances used in the assessment of chemical status compared to those monitored

For the Nemunas and Venta RBDs, 40 Priority Substances were reported to be monitored and used in the status assessment. For these RBDs, all 40 substances were reported to be used in the status assessment. For the Lielupe RBD, 24 Priority Substances were reported to be monitored and used in the status assessment. For the smaller Dauguva RBD, no Priority Substances were reported to be monitored.

[14] Amended by Directive 2013/39/EU

[15] Brominated diphenylether, Mercury and its compounds, Polyaromatic hydrocarbons (PAH), Tributyltin, PFOS, dioxins, hexabromocyclodecane and heptachlor

[16] https://www.eea.europa.eu/publications/state-of-water (p40-41 of the report). Also available in a more interactive format at : https://tableau.discomap.eea.europa.eu/t/Wateronline/views/WISE_SOW_SWB_Chemical_Status_Maps/SWB_Failing_Good_Chemical_Status_RBD?iframeSizedToWindow=true&:embed=y&:showAppBanner=false&:display_count=no&:showVizHome=no

Application of alternative environmental quality standards for water, biota and sediment

According to the EQS Directive, Member States may opt to apply Environmental Quality Standards for another matrix than the one specified in the EQS Directive for a given substance. If they do so, they have to ensure the Environmental Quality Standard they set in the other matrix (or matrices) offers at least the same level of protection as the Environmental Quality Standard established in the EQS Directive.

Lithuania has applied all of the Environmental Quality Standards laid down in Annex I of the EQS Directive. No alternative and/or additional standards for particular Priority Substances have been applied.

Use of mixing zones

Article 4 of the EQS Directive provides Member States with the option of designating mixing zones adjacent to points of discharge in surface waters. Concentrations of Priority Substances may exceed the relevant Environmental Quality Standard within such mixing zones if they do not affect the compliance of the rest of the surface water body with those standards. Member States that designate mixing zones are required to include within their RBMPs a description of the approaches and methodologies applied to define such zones, and a description of the measures taken to reduce the extent of the mixing zones in the future.

Mixing zones have not been designated in Lithuania.

Background Concentrations and Bioavailability

The EQS Directive stipulates that Member States have the possibility, when assessing the monitoring results against the Environmental Quality Standard, to take into account:

(a) natural background concentrations for metals and their compounds, if they prevent compliance with the Environmental Quality Standard, and;

(b) hardness, pH or other water quality parameters that affect the bioavailability of metals.

Natural background concentrations for metals and their compounds and water quality parameters are not reported to have been taken into consideration in any of the RBDs in Lithuania.

4.2 Main changes in implementation and compliance since the first cycle

Between the two RBMPs, there has been a net decrease in sites and surface water bodies monitored (a decrease from 1,185 to 1,183 monitoring sites and by two water bodies). The number of monitored lakes decreased by 12 sites but the number of monitored rivers increased by ten sites. In the second cycle, it was found that 51% of water bodies in the river category and 40% in the category of lakes did not meet the criteria of good status. Not all transitional and coastal water bodies meet the good status criteria.

There appears to be an increase in monitoring sites and surface water bodies monitored for operational purposes since the first RBMPs. In general, the monitoring and assessment of Priority Substances in Lithuania has been modified during the first cycle with the introduction of monitoring of Priority Substances in water, biota and sediments for both status and trend assessment.

During the implementation of the RBMPs for 2010–2015, an updated monitoring program of surface water bodies was carried out and more actual data on the status of surface water bodies was collected. Progress has been made in intercalibrating methods for examining and assessing the ecological status of water bodies by biological quality elements with other EU countries. Intercalibration compares surface water assessment criteria and test methods to ensure that good ecological status of surface water bodies is understood and assessed in the same way in all EU countries.

A monitoring structure has been set up to ensure the continuity of multi-annual monitoring of pollutants in order to obtain long-term and reliable indicators of changes in the state of the environment.

Up until 2012, monitoring of Priority Substances in water was limited in Lithuania. In the period 2006-2012, 12 Priority Substances or groups of substances were monitored in river and lake water bodies of the Nemunas RBD (out of 41 substances as set by the EQS Directive). Starting from 2012, the number of monitored substances has increased significantly, to reach 40, and some monitoring in biota was performed. The frequency of monitoring has also increased since 2012 towards the recommended minimum frequency of the EQS Directive: a number of Priority Substances are reported to have been monitored monthly (in 2012) for status assessment, with a decision for further monitoring to be made later. Other substances are reported to have been monitored quarterly, which does not meet the recommended minimum frequency for operational monitoring. For trend assessment, where substances are monitored, frequencies generally meet the recommended frequency.

The number of surface water bodies remained the same between the first and the second RBMPs. The surface water bodies with good chemical status left on the same level 99% and proportion failing to achieve good status is about 1%.

Due to the concentrations of hazardous substances that exceeded the Environmental Quality Standards, only six water bodies of the category of rivers and lakes in the Nemunas RBD did not meet the requirements of good chemical status. In the RBMPs for 2010–2015, 19 surface water bodies did not meet good chemical status.

No Priority Substances are reported to have improved from ‘failing to achieve good status’ to ‘good chemical status’ since the first RBMP.

4.3 Progress with Commission recommendations

The Commission recommendations based on the first RBMPs and PoM requested action on the following:

- Recommendation: *Mercury, hexachlorobenzene and hexachlorobutadiene should be monitored in biota for comparison with the biota standards in the EQS Directive, unless water Environmental Quality Standards providing an equivalent level of protection are derived. Where it helps to achieve the necessary analytical sensitivity, Priority Substances whose concentrations are difficult to measure in water should where possible be monitored in sediment or biota so that they can be included in the chemical status assessment. The trend monitoring in sediment or biota for several substances as specified in Directive 2008/105/EC Article 3(3) will also need to be reflected in the next RBMP.*

Assessment: Monitoring of Priority and Priority Hazardous Substances in bottom sediments of rivers and lakes was carried out in the second RBMPs, including an analysis of long-term

trends of the concentrations of substances that are liable to accumulate in bottom sediments. The following persistent, bioaccumulative and toxicsubstances were monitored: cadmium (Cd), mercury (Hg), lead (Pb), anthracene, fluoranthene, polyaromatic hydrocarbons, brominated diphenylethers, hexachlorobenzene, hexachlorocyclohexane. The first six have been monitored for a longer time, therefore data on these substances from the first RBMPs are also included in the long - term trends analysis.

In Lithuania, monitoring of Priority Substances and Priority Hazardous Substances in biota of rivers and lakes has been conducted since 2016. The results of this monitoring will be used to assess the chemical status of rivers and lakes in the third RBMPs.

For the purpose of further collection of data on pollutant concentrations and tendencies of their change, the 2018-2023 monitoring programme has been supplemented with new substances (Directive 2013/39/EU), and data on all Priority Substances in water, sediments and biota will be collected. The frequency of Priority Substance monitoring in water has been reduced for some substances taking into account recommendations of experts (sediments and biota samples are going to be collected instead of water) and based on existing data (in case long term concentrations are below limit of quantification).

The current monitoring data is sufficient to evaluate changes/trends of mercury in sediments and biota in the transitional and coastal waters. The Environmental Quality Standard for mercury in biota has been applied in the assessment of chemical status of the transitional and coastal waters, and the exceedances by year and station have been reported in the second RBMP. The long-term changes of mercury concentrations (as well as lead, cadmium and polyaromatic hydrocarbons) in the bottom sediments of the transitional and coastal waters are presented in the second RBMP. There is a lack of data on hexachlorobenzene and hexachlorobutadiene in sediments and biota in transitional and coastal waters. The missing data on hexachlorobenzene and hexachlorobutadiene are going to be collected by implementing the 2018-2023 monitoring programme, and the data will be presented in next RBMP. This recommendation has therefore been partially fulfilled.

- Recommendation: *The approach to assessing chemical status needs to be reconsidered, since there is a misunderstanding of the role of Annual Average concentrations, and Maximum Allowable Concentrations. Monitoring of Priority Substances needs to be enhanced.*

Assessment: Both AA-EQS and MAC-EQS will be applied for chemical status assessment. The surface water body to be failing good chemical status when a concentration of at least one Priority Substance exceeds the MAC-EQS or AA-EQS given in the EQS Directive, as amended by Directive 2013/39/EU. The recommendation was fulfilled.

- Recommendation: *Focus more in the second RBMPs on the source and pressure identification from chemicals, as well as the information regarding the status and scale of the pressures.*

Assessment: In the second RBMP a monitoring programme for chemical status of surface water bodies is included. Pollution sources identification is still to be developed. They will be implemented in future, as it is very costly and time-consuming work. The recommendation was therefore not fulfilled.

- Recommendation: *Take into account the inventory of sources of pollution (established in accordance with the requirements set out in Article 5 of the EQS Directive) in identifying measures against chemical pollution. Diffuse sources need to be considered.*

Assessment: A pollution sources inventory analysis was not performed. Only fragmented monitoring of industry, agriculture and other possible (including diffuse) pollution sources took place. The recommendation was therefore not fulfilled.

Topic 5 Monitoring, assessment and classification of quantitative status of groundwater bodies

5.1 Assessment of implementation and compliance with WFD requirements in the second cycle

5.1.1 Monitoring of quantitative status in groundwater

The total number of groundwater bodies in Lithuania is 20, which is the same as in the first cycle. However, the RBMPs indicated that there were significant differences in the boundaries that had been updated based on improved knowledge from the quality and quantity monitoring data. The number of groundwater bodies and the total groundwater body area have not changed.

Two groundwater bodies are not subject to monitoring for quantitative status by the monitoring program (Table 5.1). The investigations of the RBMP and background documents did not find any indication that grouping was applied, and there were no clear explanations provided for not monitoring all groundwater bodies.

The number of monitoring sites for quantitative status is listed in Table 5.2, they vary from 80% to 100% of total groundwater bodies monitored per RBD for quantitative status.

The number of groundwater monitoring sites in Lithuania is 537, of which 359 are groundwater abstraction sites for human consumption and seven of them are groundwater abstraction sites for industrial supply. Data provided in the second RBMPs differ from data provided in first RBMPs, therefore it is complicated to make a detailed comparison between the two reports.

Information on how many groundwater bodies are identified as Drinking Water Protected Areas is provided in chapter 15. Groundwater abstraction was considered to not have any significant impact on the status of NATURA 2000 sites.

Table 5.1 Number of water bodies in Lithuania directly monitored and the purpose of monitoring

RBD	Total Groundwater monitoring sites	Monitoring Purpose												
		AGR - Groundwater abstraction site for irrigation	CHE - Chemical status	DRI - Groundwater abstraction site for human consumption	DWD - Drinking water - WFD Annex IV.1.i	HAB - Protection of habitats or species depending on water - WFD Annex IV.1.v	IND - Groundwater abstraction site for industrial supply	INV - Investigative monitoring	NID - Nutrient sensitive area under the Nitrates Directive - WFD Annex IV.1.iv	OPE - Operational monitoring	QUA - Quantitative status	SOE - EIONET State of Environment monitoring	SUR - Surveillance monitoring	TRE - Chemical trend assessment
LT1100	12	12	0	0	0	0	0	0	0	11	10	12	0	0
LT2300	1	1	0	0	0	0	0	0	0	1	1	1	0	0
LT3400	5	5	0	0	0	0	0	0	0	4	2	5	0	0
LT4500	2	2	0	0	0	0	0	0	0	2	1	2	0	0

Source: WISE electronic reports

Table 5.2 Proportion of groundwater bodies in Lithuania monitored for quantitative status

RBD	No. of groundwater bodies with quantitative monitoring	Total No. groundwater bodies	% of total groundwater bodies monitored for quantitative status
LT1100	11	12	92
LT2300	1	1	100
LT3400	4	5	80
LT4500	2	2	100

Source: WISE electronic reports

Table 5.3 Number of groundwater monitoring sites in Lithuania and their purpose

BRD	Total Ground water monitoring sites	Monitoring Purpose												
		AGR - Groundwater abstraction site for irrigation	CHE - Chemical status	DRI - Groundwater abstraction site for human consumption	DWD - Drinking water - WFD Annex IV.1.i	HAB - Protection of habitats or species depending on water - WFD Annex IV.1.v	IND - Groundwater abstraction site for industrial supply	INV - Investigative monitoring	NID - Nutrient sensitive area under the Nitrates Directive - WFD Annex IV.1.iv	OPE - Operational monitoring	QUA - Quantitative status	SOE - EIONET State of Environment monitoring	SUR - Surveillance monitoring	TRE - Chemical trend assessment
LT1100	410	0	128	269	0	0	0	0	0	197	79	17	216	0
LT2300	49	0	10	38	0	0	5	0	0	19	6	1	22	0
LT3400	60	0	17	45	0	0	2	0	0	25	11	2	26	0
LT4500	18	0	6	7	0	0	0	0	0	11	4	2	14	0

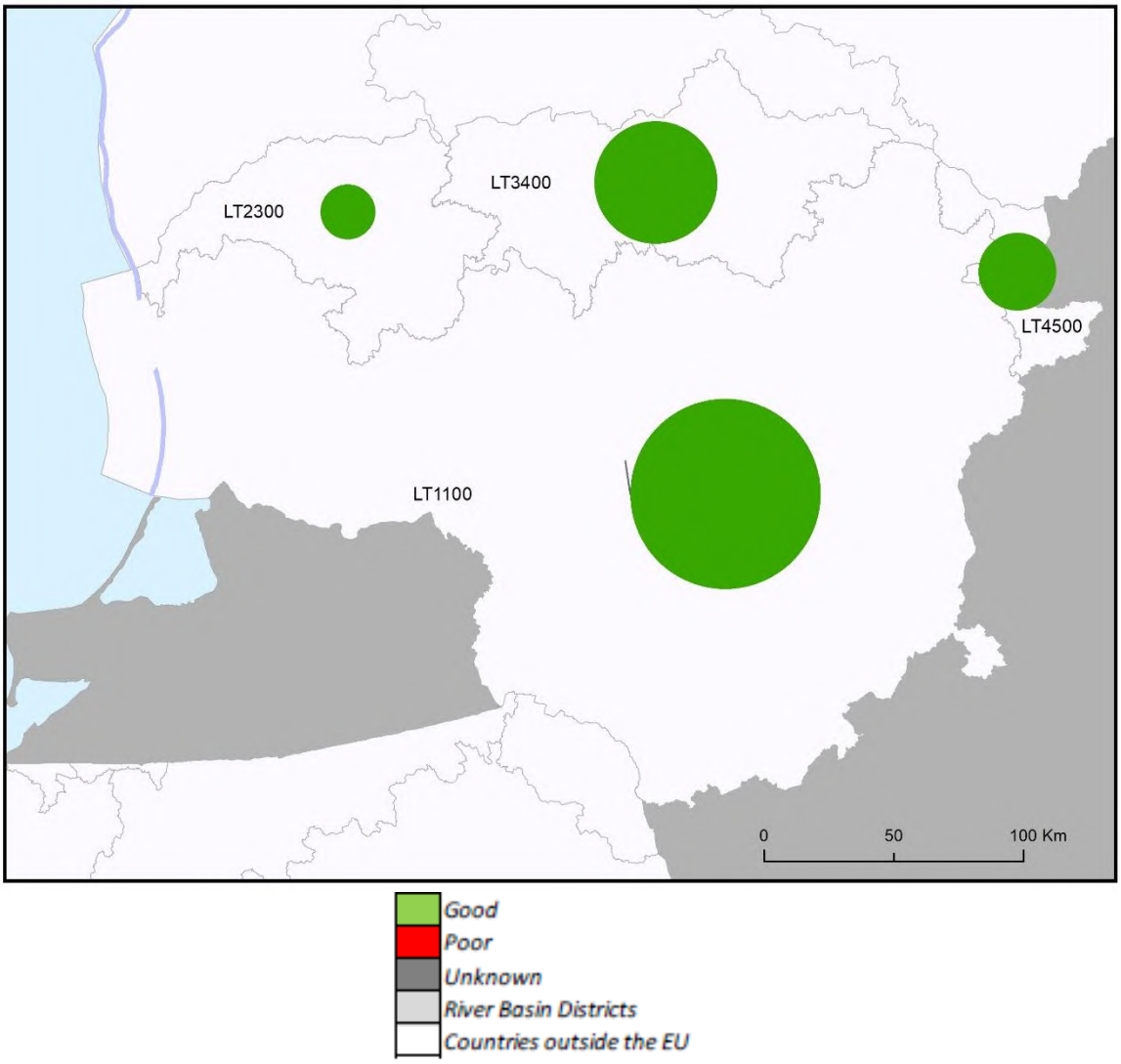
Source: WISE electronic reports

5.1.2 Assessment and classification of quantitative status for groundwater

There is no groundwater body at risk of failing good quantitative status. Map 5.1 displays the most recently assessed quantitative status of groundwater bodies. It shows that all groundwater bodies were of good quantitative status (Figure 5.1) and they had already been in good status in the first RBMP. Figure 5.2 shows the confidence in status classifications. According to this figure, all groundwater bodies have medium confidence in status classification. All groundwater bodies had, and still have, a good status in the first and second RBMPs. The expected date of achievement of good quantitative and chemical status in Lithuania was 2015, as shown in Figure 5.3.

For all RBDs, the water balance was assessed by a comparison of annual average groundwater abstraction against the 'available groundwater resource' for every groundwater body. In all RBDs the criterion of 'available groundwater resource' has been partially applied in accordance with Article 2(27) WFD.

Map 5.1 Map of the most recently assessed quantitative status of groundwater bodies



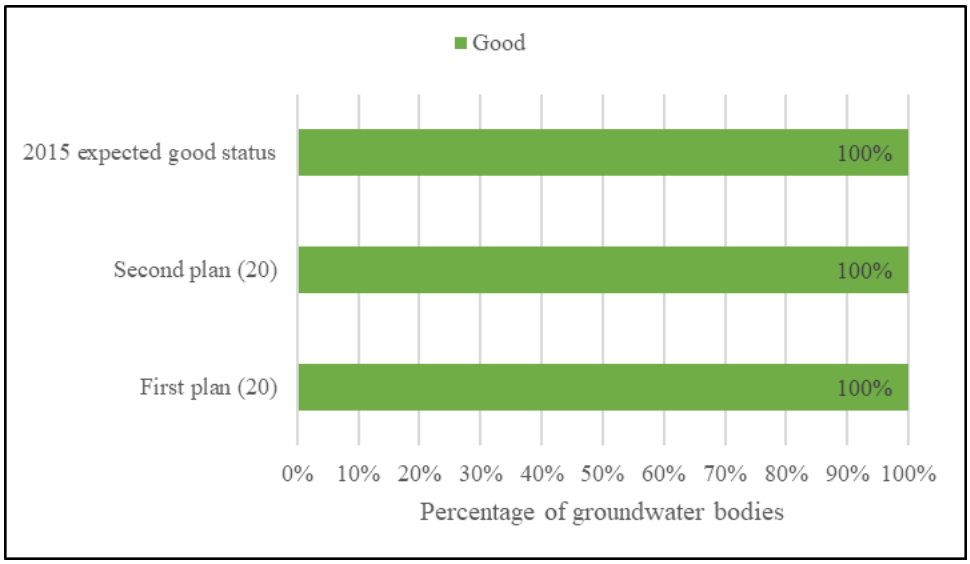
Note: Standard colours based on WFD Annex V, Article 2 (2) (4)
Source: WISE, Eurostat (country borders)

5.1.3 Consideration of groundwater associated surface waters and/or groundwater dependent ecosystems

In 18 of 20 groundwater bodies associated surface waters have been not reported.

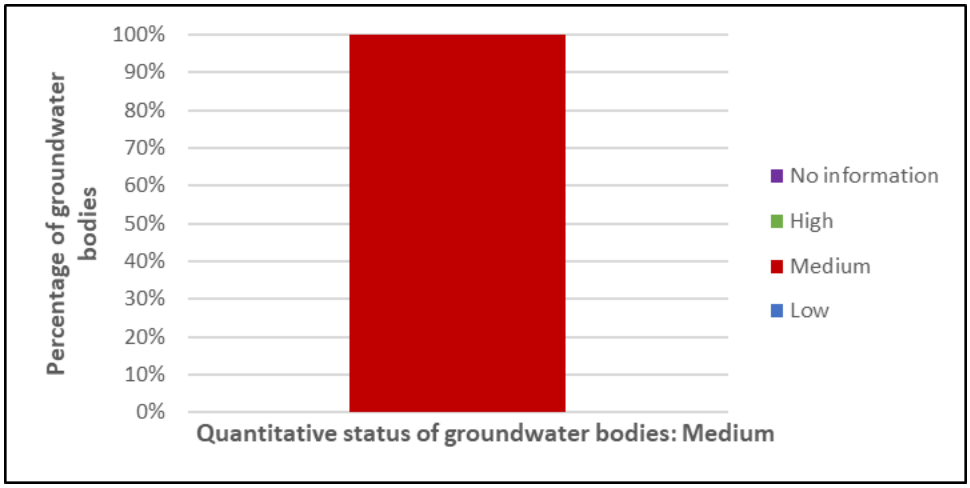
In 18 of 20 groundwater bodies groundwater dependent terrestrial ecosystems have been reported. These are not related to risks and they have not been considered in the status assessments in all RBDs. The needs of these ecosystems have been considered in status assessments in three of four RBDs.

Figure 5.1 Quantitative status of groundwater bodies in Lithuania for the second RBMPs, for the first RBMPs and expected in 2015. The number in parenthesis is the number of groundwater bodies for each cycle. The period of the assessment of status for the second RBMPs is not known. The year of the assessment of status for first RBMPs is not known



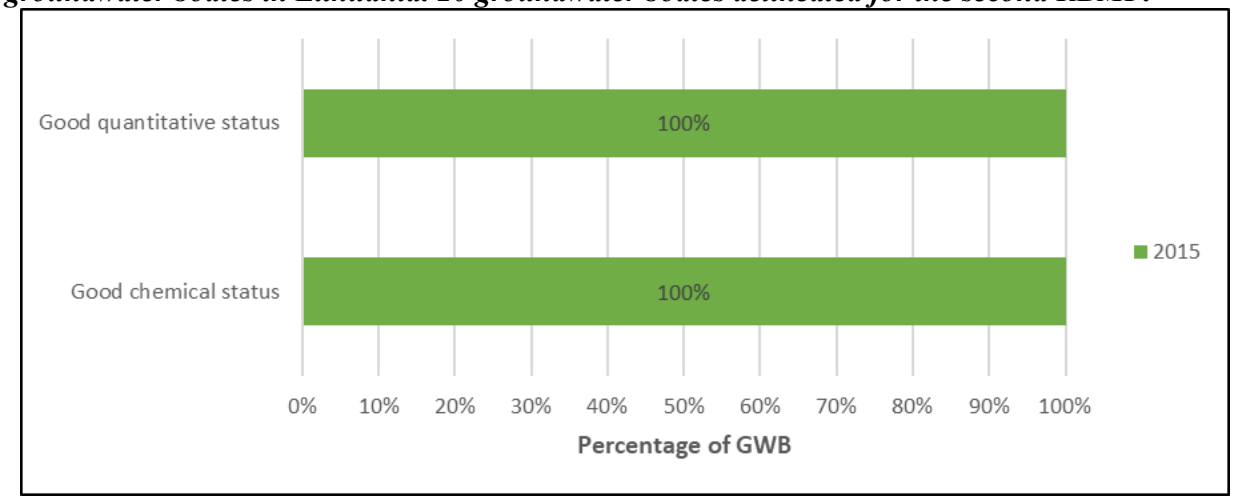
Source: WISE electronic reports

Figure 5.2 Confidence in the classification of quantitative status of groundwater bodies in Lithuania based on the most recent assessment of status



Source: WISE electronic reports

Figure 5.3 Expected date of achievement of good quantitative and good chemical status of groundwater bodies in Lithuania. 20 groundwater bodies delineated for the second RBMP.



Source: WISE electronic reports

5.2 Main changes in implementation and compliance since the first cycle

All groundwater bodies remained unchanged since the first RBMP.

Changes or updates regarding monitoring and assessment of groundwater bodies are described in the RBMPs, and it was stated that the assessment methodology was uniform in all RBDs and did not change since the first cycle.

The RBMP and background documents assessed did not indicate explicit reasons why all groundwater bodies are not monitored.

5.3 Progress with European Commission recommendations

There were no recommendations in the previous implementation report concerning the quantitative status of groundwater bodies. There were no Commission recommendations based on the first RBMP and first PoM for this topic.

Topic 6 Monitoring, assessment and classification of chemical status of groundwater bodies

6.1 Assessment of implementation and compliance with WFD requirements in the second cycle

6.1.1 Monitoring of chemical status in groundwater

The total number of groundwater bodies in Lithuania is 20. Neither the number of groundwater bodies nor the total groundwater body area changed compared to the first cycle. In total two groundwater bodies (10%) were not subject to surveillance monitoring.

No groundwater bodies were reported to be at risk of failing to meet good chemical status. The coverage of groundwater bodies by monitoring is not complete because surveillance monitoring is not implemented in all groundwater bodies. The assessment of the RBMP and background documents found no indication that any grouping of groundwater bodies for monitoring and assessment of chemical status was applied.

The number of monitoring sites is listed in Table 5.3.

All other WFD core parameters (nitrate, electrical conductivity, oxygen, ammonium and pH) are monitored in all groundwater bodies in all RBDs.

6.1.2 Assessment and classification of chemical status in groundwater

Map 6.1 and Figure 6.1 display the recently assessed chemical status of groundwater bodies. It shows that all groundwater bodies were of good chemical status. Figure 6.2 shows a high confidence level in status classifications. All groundwater bodies had, and still have, a good status, in the first and second RBMP.

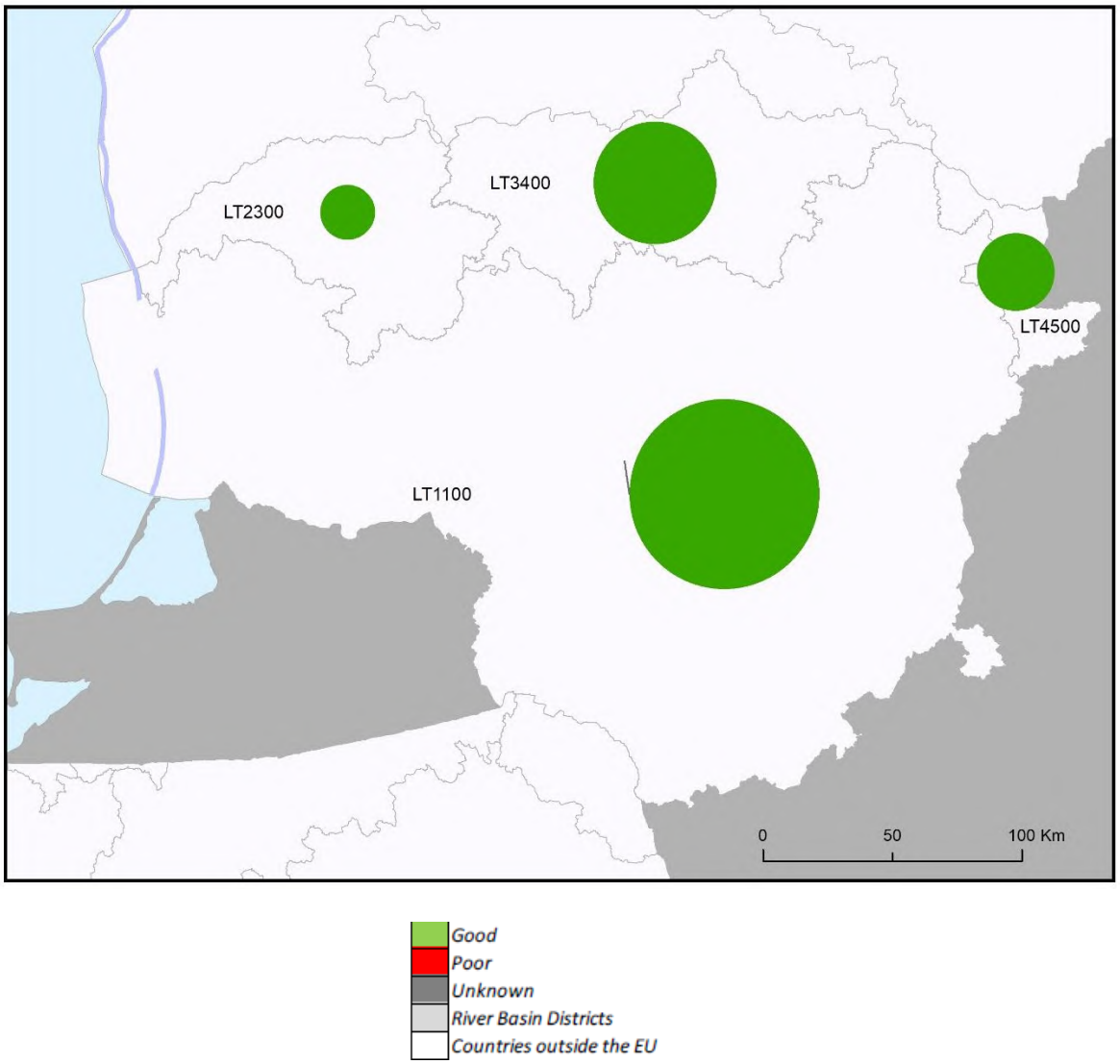
Groundwater sites with widespread sulphate and chloride anomalies (more than 500 mg/l of sulphate and chloride concentrations) were identified as potential risks in the first cycle. In order to find out whether groundwater sites maintenance affects the quality of groundwater in them and what are the prevailing trends, an extended monitoring of problem indicators was organized in 2013. The research results allowed Lithuania to specify the limits of anomalies and to evaluate the trends of change. The research concluded that the current intensity of groundwater exploitation does not change the quality of groundwater at the regional level, and determined there there was a general reduction trend for chloride and sulphate concentrations in the groundwater bodies.

There are no groundwater bodies with poor status, neither in the first nor second cycle. The extent of exceedance of a groundwater quality standard or a groundwater threshold value was not calculated as there are no such exceedances: no monitoring site exceeds any groundwater quality standard or threshold value for any pollutant.

The drinking water quality standard for human consumption is used as a basis for assessing the chemical status of groundwater, but the values of naturally occurring compounds, such as sulphates, chlorides, ammonium, iron and manganese concentrations, are not taken into account as they are normally removed in water purification plants. Some groundwater sites have higher concentrations of fluoride than drinking water quality standards.

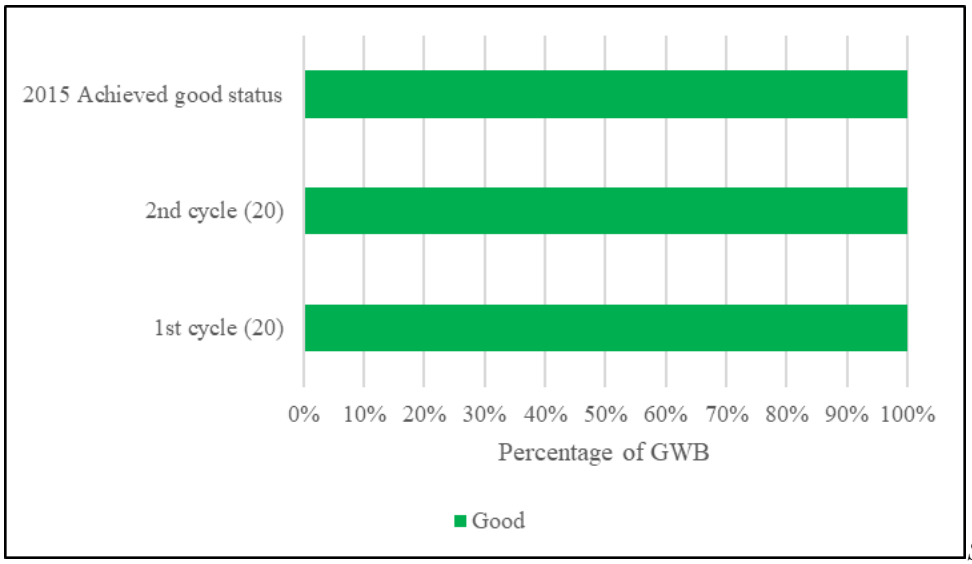
A trend methodology is available, and assessments have been performed in all RBDs. A trend reversal methodology is available in two of the RBDs.

Map 6.1 Map of chemical status of groundwater bodies in Lithuania based on the most recently assessed status of the groundwater bodies



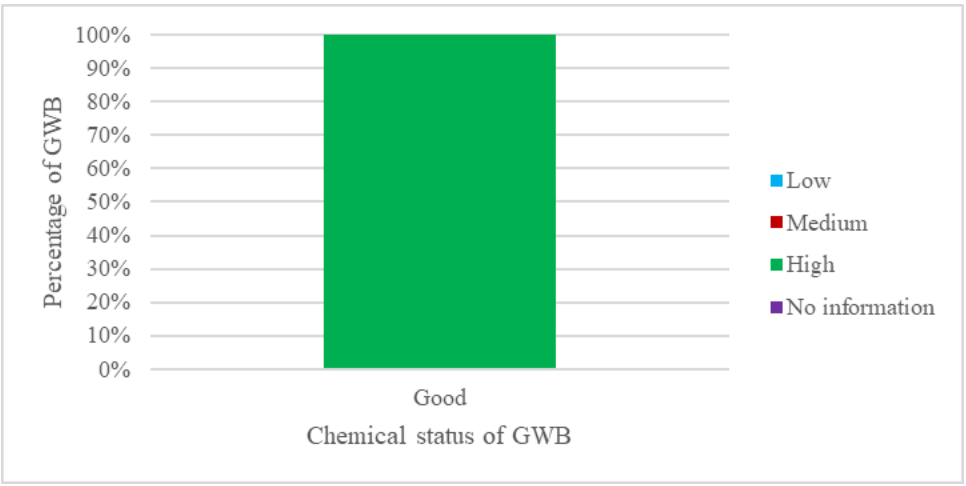
Note: Standard colours based on WFD Annex V, Article 2.4.5.
Source: WISE, Eurostat (country borders)

Figure 6.1 Chemical status of groundwater bodies in Lithuania for the second RBMPs, for the first RBMPs and expected in 2015. The number in the parenthesis is the number of groundwater bodies for both cycles. NB - the period of the assessment of status for the second RBMPs is not known. The year of the assessment of status for the first RBMPs is not known



Source: WISE electronic reports

Figure 6.2 Confidence in the classification of chemical status of groundwater bodies in Lithuania based on the most recent assessment of status



Source: WISE electronic reports

6.1.3 Consideration of groundwater associated surface waters and/ or groundwater dependent ecosystems

In 18 of 20 groundwater bodies groundwater associated surface waters have been reported. They are not related to risks as there are no groundwater bodies at risk. They have not been considered in the status assessments.

In 18 of 20 groundwater bodies groundwater dependent terrestrial ecosystems have been reported. They are not related to risks as there are no groundwater bodies at risk. Groundwater dependent terrestrial ecosystems have been considered in the status assessments in three of the four RBDs.

6.2 Main changes in implementation and compliance since the first cycle

The assessment of the RBMP and background documents identified that there are summary chapters in each RBMP, but not in all of these chapters do contain information on groundwater issues. Because not all groundwater basins have issues. Changes or updates regarding monitoring and assessment of groundwater bodies are described in the RBMP. The assessment methodology did not change. The only change from the first cycle was in the number of monitoring sites.

All groundwater bodies remain unchanged since the first RBMP.

All groundwater bodies are still of good chemical status.

6.3 Progress with Commission recommendations

There were no Commission recommendations based on the first RBMP and first PoM for this topic.

Topic 7 Designation of Heavily Modified and Artificial Water Bodies and definition of Good Ecological Potential

7.1 Assessment of implementation and compliance with WFD requirements in the second cycle

7.1.1 Designation of Heavily Modified and Artificial Water Bodies

HWMBs are designated in the categories of rivers, lakes and transitional waters, and artificial water bodies are designated in the categories of lakes and river waters (Figure 7.1).

Artificial water bodies remained the same between the first and second RBMPs, with a total number of five (one for lakes, and four for rivers).

The majority of heavily modified river water bodies are designated due to agricultural land drainage. The RBMPs explain that HWMBs are those water bodies that are regularly dredged and redesigned for land improvement purposes. The main physical alterations of river water bodies are land drainage and weirs/dams/reservoirs.

Following the revision of the criteria for the designation of water bodies during the second RBMP cycle, 11 HWMBs in rivers were re-considered as not being so.

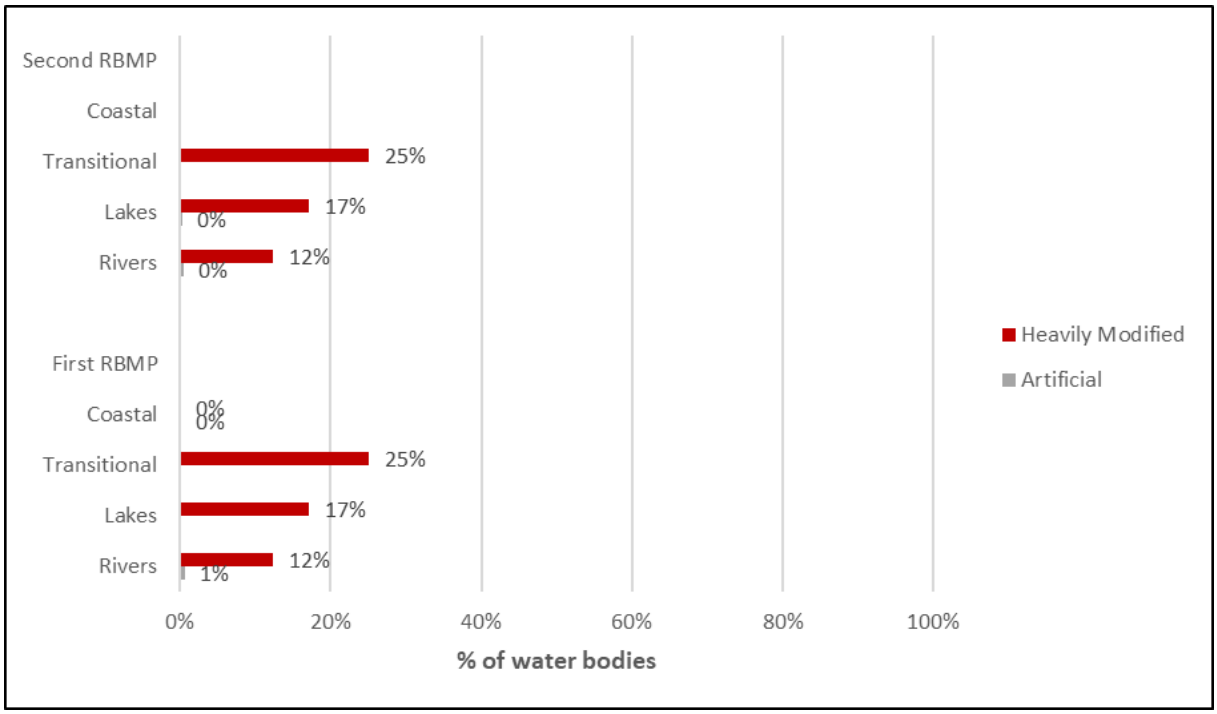
The national methodology for heavily modified water body designation has been modified since the first planning cycle. In the second RBMPs, river water bodies with a basin area of more than 30 km2 and a length of more than 3 km were included. Lakes and ponds larger than 50 hectares, as well as artificial water bodies, were included in the second cycle. More precise GIS evaluation and observation in the field was applied during the assessment of HWMBs. These efforts resulted in major changes in the number and length of HWMBs.

The length of 73 HWMBs indicated during the first RBMP cycle was changed due to the revision of the criteria for the designation of water bodies. Generally for all cases, the length of the each river has decreased. During the second RBMP cycle, an additional 193 new water bodies were designated HWMBs. A total of 310 water bodies are included in the second RBMP cycle as HWMBs, of which 244 are rivers water bodies.

There are 582 rivers bodies in the country, of which 70 rivers bodies are classified as HWMBs, this number constitutes 12% of all rivers in the country.

The methodology provides information on the assessment of better environmental options. In relation to HWMBs designated due to land drainage, it is stated that there is no alternative for the maintenance of drained land. Other alternatives are considered as impractical and economically expensive. No financial calculations are provided. The ponds and dams are designated for energy productions and recreation, no other options are evaluated.

Figure 7.1 Proportion of total water bodies in each category in Lithuania that has been designated as heavily modified or artificial



Source: WISE electronic reports

7.1.2 Definition of Good Ecological Potential for Heavily Modified and Artificial Water Bodies

Good ecological potential is reported as defined in all RBDs, following the Common Implementation Strategy Guidance approach (approach based on biological quality elements as illustrated in CIS Guidance document No 4). Good ecological potential is defined for groups of HWMBs and artificial water bodies of the same use/physical modification in all RBDs.

According to information in the second RBMPs, the assessment of ecological potential was based on monitoring data from previous years. The classification of HWMBs and artificial water bodies in terms of biological elements followed national classifications for ecological status, chemical status and ecological potential. For HWMBs classified as lakes, the same water quality elements and numerical values was used as for natural lakes category. For HWMBs classified as rivers, the same water quality elements were used as for natural rivers category, but numerical values was slightly reduced. All evaluations are based on monitoring results and mitigation measures (i.e., the Prague approach). The assessment of significant effects is performed at the water body level on a case-by-case basis without specific criteria for the different uses. The basis of the assessment is expert judgement. General guidance is given in the national methodology.

Good ecological potential is also reported as defined in terms of biology in the four RBDs. The biological quality element for which biological values have been derived to define maximum and good ecological potential are phytobenthos, macrophytes, benthic invertebrates, fish, phytoplankton, macroalgae, and angiosperms.

Biological values have only been derived in cases where monitoring data (survey monitoring, operational monitoring or data collected through different projects) are available (using methods for status assessments).

For rivers, methods for assessing fish and benthic invertebrates are reported as sensitive to altered habitats due to morphological changes.

Mitigation measures for defining good ecological potential have been reported in all RBDs. They are related to continuity issues (fish ladders, bypass channels) and the removal of structures. However, no description of the ecological changes are expected due to the mitigation measures found.

7.2 Main changes in implementation and compliance since the first cycle

Heavily modified and artificial water bodies were designated in Lithuania for the first time in 2005. In the first RBMPs, the methodologies used for the designation included the assessment of hydromorphological status and refinement of threshold values to finalise the initial identification of heavily modified and artificial water bodies. For the second cycle, the classification of HWMBs and artificial water bodies was updated in 2010-2015, based on the update of information on topology, drainage area, and physical parameters.

Since, there has been an update of the list of HWMBs based on an order of the Ministry of Environment 2017 (‘Approval of the water development program 2017–2023’), during which the validity of HWMBs was checked, taking into account the updated status assessments.

Significant changes have been noted in the number of designated HWMBs and artificial water bodies since the first RBMPs.

7.3 Progress with Commission recommendations

There were no Commission recommendations based on the first RBMP and first PoM for this topic.

Topic 8 Environmental objectives and exemptions

8.1 Assessment of implementation and compliance with WFD requirements in the second cycle

8.1.1 Environmental objectives

The environmental objectives are defined in Article 4 of the WFD. The aim is long-term sustainable water management based on a high level of protection of the aquatic environment. Article 4(1) WFD defines general objective to be achieved in all surface and groundwater bodies, i.e. good status by 2015. Within that general objective, specific environmental objectives are defined for HWMBs (good ecological potential and good chemical status by 2015[17]), groundwater bodies (good chemical and quantitative status by 2015) and for Protected Areas (achievement of the objectives of the associated Directive by 2015 unless otherwise specified).

Environmental objectives for ecological and chemical status of surface water bodies, as well as for chemical and quantitative status of groundwater, have been reported in all RBDs. Moreover, information on when the objectives will be achieved have also been reported in all RBDs in Lithuania.

Assessments of the current status of surface and groundwater bodies in Lithuania are provided elsewhere in this report: for ecological status/potential of surface waters (Chapter 3); chemical status of surface waters (Chapter 4); quantitative status of groundwater bodies (Chapter 5); chemical status of groundwater bodies (Chapter 6); status of surface and groundwater bodies associated with Protected Areas (Chapter 15).

For the second cycle RBMPs, Member States are required to report the date when they expect each surface and groundwater body to meet its environmental objectives. This information is summarised for Lithuania elsewhere in this report: for ecological status/potential of surface waters (Chapter 3); chemical status of surface waters (Chapter 4); quantitative status of groundwater bodies (Chapter 5); and chemical status of groundwater bodies (Chapter 6).

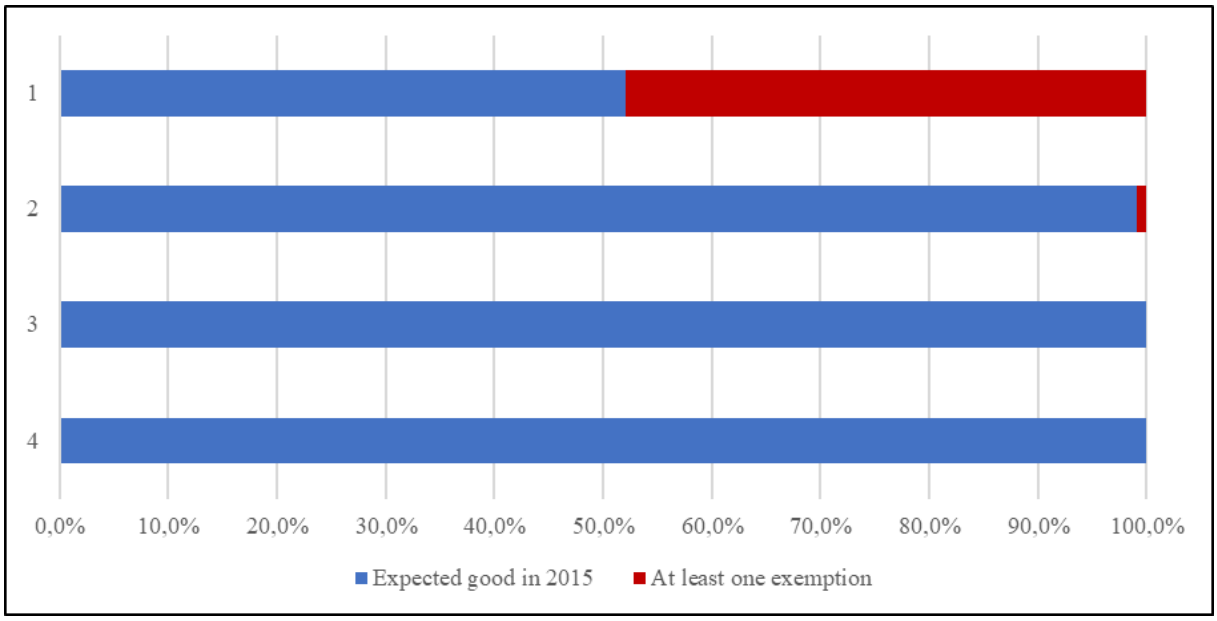
8.1.2 Exemptions

Where environmental objectives are not yet achieved exemptions can be applied in case the respective conditions are met and the required justifications are explained in the RBMP.

Figure 8.1 summarises the percentage of water bodies expected to be at least in good status in 2015 and the use of at least one exemption in Lithuania for the four main sets of environmental objectives.

[17] For Priority Substances newly introduced by Directive 2013/39/EU, good status should be reached by 2027, and for the 2008 Priority Substances, for which the Environmental Quality Standards were revised by Directive 2013/39/EU, good status should be reached in 2021.

Figure 8.1 Water bodies in Lithuania expected to be in at least good status in 2015 and use of exemptions. 1 = Surface water body ecological status/potential; 2 = Surface water body chemical status; 3 = Groundwater body quantitative status; 4 = Groundwater body chemical status



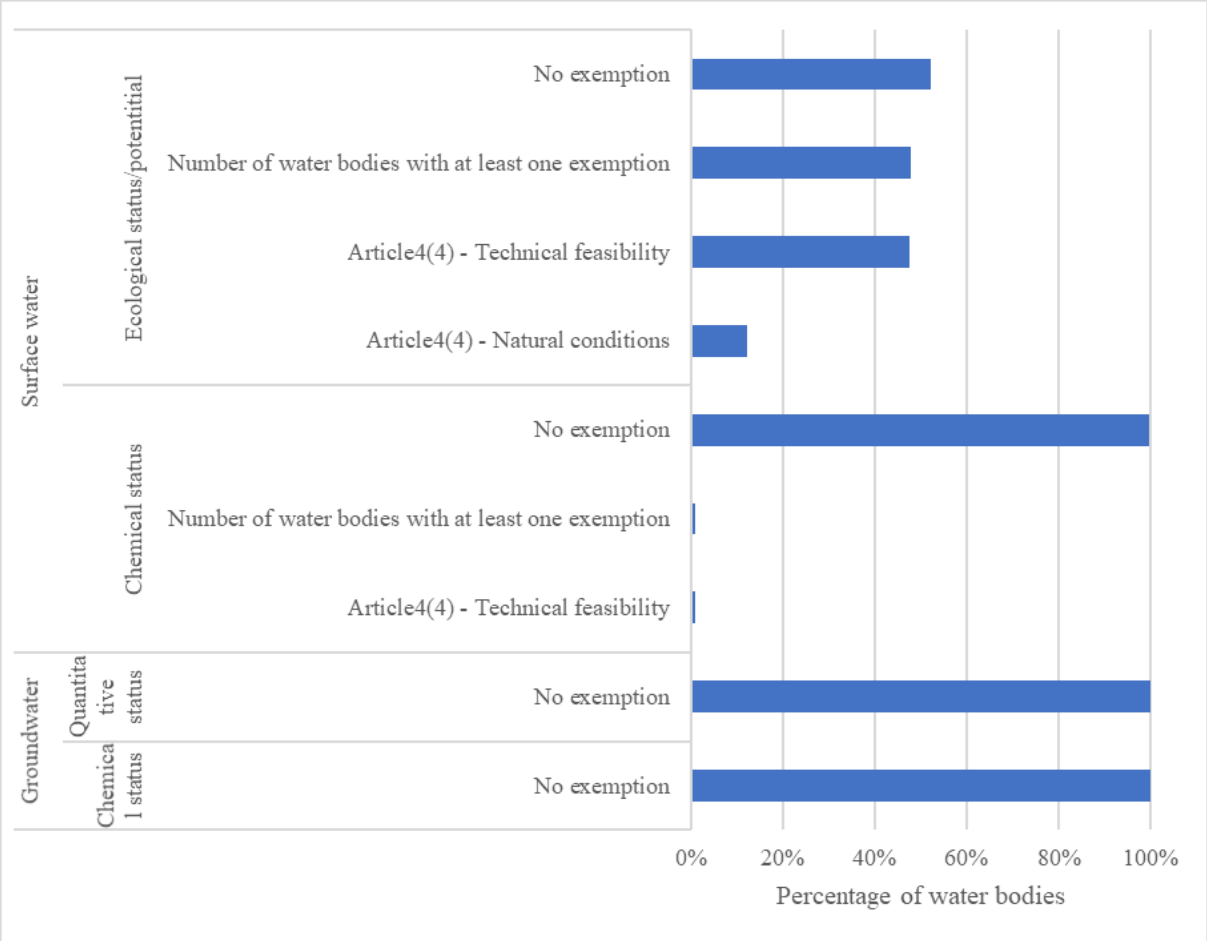
Source: WISE electronic reports. For some water bodies the date for achievement of good status is unknown.

Article 4 of the WFD allows for different exemptions to the objectives under certain conditions. The exemptions under Article 4 WFD include the provisions in Article 4(4) - extension of deadline beyond 2015, Article 4(5) - lower objectives, Article 4(6) - temporary deterioration and Article 4(7) - new modifications / new sustainable human development activities. Article 4(4) exemptions may be justified by: disproportionate cost, technical feasibility or natural conditions, and Article 4(5) by disproportionate cost or technical feasibility.

In addition, Article 6(3) of the Groundwater Directive allows Member States to exempt inputs of pollutants to groundwater under certain specified circumstances.

Figure 8.2 summarises the percentage of water bodies subject to each type of exemption (and reason) in relation to the four types of environmental objectives in Lithuania.

Figure 8.2 Type of exemptions reported to be applied to surface water and groundwater bodies for the second RBMP in Lithuania. NB - Ecological status and groundwater quantitative status exemptions were reported at the water body level. Chemical exemptions for groundwater were reported at the level of each pollutant causing failure of good chemical status, and for surface waters for each Priority Substances that is causing failure of good chemical status.



Source: WISE electronic reports

Application of Article 4(4) WFD

For the application of Article 4(4) WFD in surface water bodies, the number of exemptions has not significantly changed compared to the first RBMPs. The total number of exemptions are increased in three out of four RBMPs, and the Dauguva RBMP has no exemptions. The justifications for the exemptions have changed but contradictory information has been reported.

The exemptions under WFD Article 4 include the provisions in Article 4(4) - extension of deadline. Article 4(4) exemptions may be justified by disproportionate cost, technical feasibility or natural conditions.

A detailed assessment of the Nemunas RBMP shows that exemptions under Article 4(4) WFD are justified on the basis of technical feasibility, and in particular due to uncertainty concerning the source of the problem.

The pressures on surface water bodies were identified as mainly from diffuse pollution (Lielupe, Venta and Nemunas RBDs).

Table 8.1 shows the main significant pressures for Priority Substances failing to achieve good chemical status and for which exemptions have been applied. The main pressure is unknown anthropogenic pressure.

As in the first RBMPs, no exemptions are applied to groundwater bodies in the second RBMPs.

Table 8.1 Pressure responsible for Priority Substances in Lithuania failing to achieve good chemical status and for which exemptions have been applied

Significant pressure on surface water bodies	Number of Failing Priority Substances	Article4(4) - Technical feasibility	Article4(5) - Technical feasibility
	Number	Number	Number
8 - Anthropogenic pressure - Unknown	7	16	0

Source: WISE electronic reports

Application of Article 4(5) WFD

No exemptions according to Article 4(5) have been applied.

Application of Article 4(6) WFD

No exemptions according to Article 4(6) have been applied.

Application of Article 4(7) WFD

No exemptions according to Article 4(7) have been applied.

Application of Article 6(3) of the Groundwater Directive

No exemptions according to Article 6(3) of the Groundwater Directive have been applied.

8.2 Main changes in implementation and compliance since the first cycle

The second RPMPs present information on differences since the first RBMPs. There are changes in the assessment results, but according to the RBMPs the methodologies used for the objectives and exemptions have not changed. For Article 4(4) WFD, in surface waters it seems that the number of exemptions has not significantly changed, although in the Nemunas and Lielupe RBD it has increased. In the first RBMPs disproportionate costs and technical feasibility were used as justification for the use of Article 4(4) WFD, while in the second RBMPs, and despite technical feasibility being listed as the reason for exemptions in the Nemunas RBMP, natural conditions are reported to WISE. Article 4(5) WFD has not been applied in surface water bodies in the second RBMPs for all RBDs. No exemptions are applied to groundwater bodies. Article 4(6) and Article 4(7) WFD have also not been used in either cycle.

8.3 Progress with Commission recommendations

The Commission recommendations based on the first RBMPs and PoM requested action on the following:

- Recommendation: *A large number of exemptions have been applied in this first cycle of RBMPs. While the WFD does provide for exemptions, there are specific criteria that must be fulfilled for their use to be justified. The application of exemptions needs to be transparent. The high number of exemptions applied in these first RBMPs is a cause of concern. Lithuania should take all necessary measures to bring down the number of exemptions for the next cycle, including the needed improvements in the characterisation process, monitoring networks and status assessment methods, as well as reducing significantly the degree of uncertainties.*

Assessment: Improvements in water status assessment methodology has been made in line with new data and scientific progress as well as the EU-wide intercalibration exercise. In the second cycle most exemptions relate to lakes and their natural capacity to respond to measures, as well as the availability of realistic measures. Exemptions do not violate the timelines set out in the WFD.. Relevant information was lacking in the RBMPs, and reported background documents, to determine whether exemptions related to disproportional costs and natural conditions could be justified in terms of meeting WFD requirements. The recommendation has therefore been partially fulfilled.

- Recommendation: *It is unclear whether there are new physical modifications planned in RBMPs. If this is the case, the use of exemptions under Article 4(7) WFD should be based on a thorough assessment of all the steps as requested by the WFD, in particular an assessment of whether the project is of overriding public interest and whether the benefits to society outweigh the environmental degradation, and the absence of alternatives that would be a better environmental option. Furthermore, these projects may only be carried out when all possible measures are taken to mitigate the adverse impact on the status of the water. All conditions for the application of Article 4(7) WFD in individual projects must be included and justified in the RBMPs as early in the project planning as possible.*

Assessment: Article 4(7) WFD was not applied in the second RBMPs, and was consequently not reported. No major physical modification activities have been planned, thus no information relating to this matter has been included in the second RBMPs. The fulfilment of the recommendation can therefore not be assessed.

- Recommendation: *Assess the gap to good environmental status/potential as a starting point for the planning of measures and the justification of exemptions in the second RBMPs cycle.*

Assessment: Environmental objectives for chemical and ecological status of surface water and chemical and quantitative status of groundwater were reported in all RBDs and deadlines for when objectives should be met were set. A relatively small number of water bodies have exemptions in place and related deadline extensions to 2027. However, in order to address these exemptions by 2027, an acceleration in the adoption of proactive measures will be required. The recommendation has therefore been partially fulfilled.

- Recommendation: *Assess any new or maintenance work on the drainage of agricultural lands against Art 4.7 WFD, and execute only compliant projects.*

Assessment: Article 4(7) WFD was not applied in the second RBMPs, and was consequently not reported. The fulfilment of the recommendation can therefore not be assessed.

Topic 9 Programme of measures

The aim of this chapter is to provide an overview of the PoMs reported by Member States; more specific information on measures relating to specific pressures (for example arising from agriculture) is provided in subsequent chapters.

The Key Types of Measure (KTM) referred to in this section are groups of measures identified by Member States in the Programme of Measures (PoM), 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. KTMs have been introduced to simplify the reporting of measures and to reduce the very large number of Supplementary Measures reported by some Member States (WFD Reporting Guidance 2016).

A KTM may be one national measure but it would typically comprise more than one national measure. The 25 predefined KTMs are listed in the WFD Reporting Guidance 2016.

The KTMs should be fully implemented and made operational within the RBMP planning period to address specific pressures or chemical substances and achieve the environmental objectives.

9.1 Assessment of implementation and compliance with WFD requirements in the second cycle

9.1.1 General issues

An indication as to whether or not measures have been fully implemented and made operational is when they have been reported as being planned to tackle significant pressures (at the KTM level). Significant pressures are also reported at the water body level. It would therefore be expected that there would be measures planned in the RBMP to tackle all significant pressures.

A comparison of pressures for which KTMs have been made operational with significant pressures identified on groundwater bodies and surface water bodies showed that information is similar for all RBDs, and on the whole, most of the significant pressures failing objectives are covered by KTMs. For example, in the Nemunas RBD all significant pressures for surface waters, with the exception of abstraction or flow diversion for public water supply, are covered by KTMs. Significant other pressures include ‘channel not working’, ‘flood risk’ and ‘transboundary pollution’. For groundwater, in the Nemunas RBD the pressures causing failure of objectives are ‘other - point sources’, ‘contaminated sites’, ‘diffuse agricultural pollution’ and ‘nitrate’, but KTMs were only reported for the last three pressures.

No national basic measures to KTMs have been reported as being mapped in Lithuania, probably due to mistakes in in the submission of data to WISE. However, 179 national supplementary measures have been mapped to KTMs in all RBDs.

A total of 25% of national supplementary measures have been mapped to KTM2 – ‘Reduce nutrient pollution from agriculture’, and 20% of national supplementary measures have been mapped to KTM99 – ‘Other key type measure reported under PoM’. No national measures have been mapped to KTM16 – ‘Upgrades or improvements of industrial wastewater treatment plants (including farms)’, KTM18 – ‘Measures to prevent or control the adverse impacts of invasive

alien species and introduced diseases', or KTM25 – 'Measures to counteract acidification'. Comparing the basic measures reported with the requirements of Article 11(3) of the WFD, no measures for cost recovery of water services (Article 11(3)(b)) or for recharge augmentation of groundwater (Article 11(3)(f)) have been reported.

An inventory of national measures, including supplementary measures, identifying the requirements of Article 11(3) WFD that each measure fulfiled is provided, together with links to further information on Article 11(3)(c-k) basic measures for all RBDs.

Three measures relate to the implementation of the Urban Waste Water Treatment Directive (91/271/EEC), and one relates to the implementation of the Integrated Pollution Prevention Control Directive (96/61/EC) and the Industrial Emissions Directive (2010/75/EU) fulfilling the requirements of Article 11(3)(a) WFD, and mostly linked to KTM1 and KTM15. The one other measure mapped to KTM2 – 'Reduce nutrient pollution from agriculture', is reported to fulfil the requirements of Article 11(3)(h) WFD: Measures to prevent or control the input of pollutants from diffuse sources liable to cause pollution. Lithuania has provided an inventory of national basic measures, which includes supplementary measures, and measures for all RBDs.

KTMs have been identified to address all River Basin Specific Pollutants and substances causing a failure of objectives respectively in surface water in the Lithuanian RBDs. These include mercury, Di(2-ethylhexyl)phthalate (DEHP), chloroalkanes, nitrate, sulphate and pesticides in the Nemunas RBD. There is no information on measures to address River Basin Specific Pollutants in surface water in the Dauguva and Venta RBDs.

Few Priority Substances (mercury, pentachlorophenol, chloroalkanes, hexachlorobenzene) have been reported to cause failure of objectives in surface water in the Nemunas RBD. There is no information for the Dauguva and Lielupe RBDs.

Lithuania reported a significant amount of information on the progress that was expected to have been achieved from the implementation of the first PoM. Indicators of the scale and extent of the pressures or chemical substances to be reduced by measures to achieve environmental objectives, and indicators of the remaining measures that are needed to be made operational to achieve environmental objectives were provided for a wide range of pressures and substances in three of the RBDs, and for a more limited range of pressures in the Daugava RBD for 2015. As no information has been reported on the number of water bodies expected to fail to achieve good status as a result of significant pressures, it is not possible to determine whether the achievements planned for 2015 have been achieved, nor whether the measures planned to be achieved by 2021 are sufficient.

Cost-effectiveness analysis is an appraisal technique that provides a ranking of alternative measures on the basis of their costs and effectiveness, where the most cost-effective has the highest ranking. For the first PoM, Lithuania did not undertake a cost-effectiveness analysis. For the second PoM, a combination of quantitative and qualitative cost-effectiveness analyses were carried out in all four RBDs to support the selection of the new measures proposed.

A critical factor in the success of the implementation of the PoMs is the availability of funding to support the required investments. However, no information has been reported on costs of measures or EU funds used. There is no overall financial commitment for the implementation of PoMs in any of the RBDs. At the sectoral level, commitments have been secured in all RBDs for the urban sector, and flood protection, but not for any of the other sectors.

Coordination of the preparation of all RBMPs and PoMs with the Marine Strategy Framework Directive is reported as not having taken place for any of the required aspects in all four RBDs. However, KTMs that are relevant to the Marine Strategy Framework Directive are listed for all RBDs, with an indication of the type of measure, but no indication of the pressures they are addressing has been provided.

The RBMP and Flood Risk Management Plan have not been integrated into a single plan in any of the four RBDs; no joint consultation between RBMPs and Flood Risk Management Plans, nor consideration of the objectives and requirements of the FD in the second RBMPs and PoMs, was reported in any of the RBDs. This is also the case for the inclusion of win-win measures in terms of achieving the objectives of the WFD and FD, drought management and use of Natural Water Retention Measures, and the design of new and existing structural measures, such as flood defences, storage dams and tidal barriers, to take account of WFD environmental objectives. However, financial commitments for the implementation of PoMs are in place in the flood protection areas, and Article 9(4) of the WFD has been applied to impoundments for flood protection.

9.1.2 Measures related to other significant pressures

The only other significant pressures in surface waters within all RBDs that have been identified are 'anthropogenic pressures – unknown', 'anthropogenic pressures – other' and 'anthropogenic pressures – historical pollution'. Indicators of the scale and extent of the pressures or chemical substances to be reduced by measures to achieve environmental objectives, and indicators of the remaining measures that are needed to be made operational to achieve environmental objectives were provided for 2015 and 2021 (or for 2027). There is no information for other significant pressures on groundwater.

9.1.3 Mapping of national measures to Key Types of Measure

It was expected that Member States would be able to report their PoM by associating their national measures with predefined KTMs. 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. Member States are required to report on the national measures associated with the KTMs, and whether the national measures are basic (Article 11(3)(a) WFD or Article 11(3)(b-l) WFD) or supplementary (Article 11(4) WFD).

Table 9.1 summarises the number of national measures that have been mapped to the relevant KTMs in Lithuania. The number of RBDs for which the KTM has been reported is also shown. Table 9.2 then summarises the type of basic measures associated with the national measures mapped against the KTM.

Table 9.1 Mapping of the types of national measures to KTMs in Lithuania

Key Type Measure	National basic measures	National supplementary measures	Number of BRDs where reported
KTM1 - Construction or upgrades of wastewater treatment plants	0	9	3
KTM12 - Advisory services for agriculture	0	2	2
KTM14 - Research, improvement of knowledge base reducing uncertainty	0	12	4

Key Type Measure	National basic measures	National supplementary measures	Number of BRDs where reported
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	0	15	4
KTM2 - Reduce nutrient pollution from agriculture	0	45	4
KTM21 - Measures to prevent or control the input of pollution from urban areas, transport and built infrastructure	0	11	3
KTM23 - Natural water retention measures	0	12	3
KTM5 - Improving longitudinal continuity (e.g. establishing fish passes, demolishing old dams)	0	12	3
KTM6 - Improving hydromorphological conditions of water bodies other than longitudinal continuity	0	1	1
KTM7 - Improvements in flow regime and/or establishment of ecological flows	0	24	4
KTM99 - Other key type measure reported under PoM	0	36	4
Total number of Mapped Measures	**0**	**179**	**35**

Source: WISE electronic reports

9.1.4 Pressures for which gaps are to be filled to achieve WFD objectives and the Key Types of Measure planned to achieve objectives

Member States are required to report the gaps that need to be filled to achieve the WFD environmental objectives in terms of all significant pressures on surface waters and groundwaters, in terms of Priority Substances causing failure of good chemical status and in terms of River Basin Specific Pollutants causing failure of good ecological status/potential. Member States were asked to report predefined indicators of the gaps to be filled or other indicators where relevant. Values for the gap indicators were required for 2015 and 2021 and were optional for 2027.

The information reported in WISE on the gaps to fulfil to achieve good ecological status include detailed data on the significant pressures on surface and groundwaters that may cause failure on the environmental objectives. For chemical status, the Member States reported the specific chemical substances causing failure.

This information is reported at the sub-unit level. Sub-units are smaller geographic areas within particular RBDs identified by Member States. Not all Member States have defined and reported sub-units.

Member States were required to report which KTMs are to be made operational to reduce the gaps to levels compatible with the achievement of WFD environmental objectives. A number of indicators were predefined for each KTM. Values of the indicators for the second and subsequent planning cycles were also to be reported to give an indication of the expected progress and achievements: the values for 2027 could be optionally reported. This means that the value of the indicator will be reduced with time as measures are implemented. A value of zero is comparable with 100% good ecological status or potential or good chemical status.

This information was reported at sub-unit level, or at RBDs level if sub-units have not been reported by the Member State.

9.2 Main changes in implementation and compliance since the first cycle

The level of implementation of the first PoMs in Lithuania was reported as being that some measures have been completed in all four RBDs. Obstacles to full implementation of the PoMs were reported to be governance, lack of finance and lack of mechanisms for all RBDs, as well as a lack of research on the effect of measures leading to prioritisation, postponement to the next cycle and need to prioritise measures under limited time and financing.

Significant progress seems to have been made in the priority area of expanding wastewater collection systems and improving wastewater treatment levels. In addition, gap analyses have been carried out for most significant pressures, with the gaps expected to be closed largely by 2021, and the remaining by 2027.

For the first PoM cost-effectiveness analysis was not used for the selection of measures. For the second PoM a combination of quantitative and qualitative cost-effectiveness analyses was carried out in all four RBDs to support the selection of new measures proposed.

9.3 Progress with Commission recommendations

The Commission recommendations based on the first RBMPs and PoM requested action on the following:

- Recommendation: *Ensure for the second RBMPs cycle that the maximum scenario set out what it would cost to implement the measures needed to achieve good status (this should be informed by the updated article 5 WFD -pressures and impacts analysis-).*

  Assessment: While no maximum scenarios were presented in the second RBMPs reports, a lot of information is provided in order to make a general overview of the efforts required for Lithuania to achieve good status across all water bodies. The recommendation has therefore been partially fulfilled.

- Recommendation: *Improve the characterisation of pressures in order to significantly reduce the cases of unknown pressures, and to ensure that pressures are linked with appropriate measures, and that funding is made available for them.*

  Assessment: There has been no characterisation of individual pressures in the second RBMPs. It should however be noted that evaluating each case is both time consuming and costly. When preparing plans for the whole river basin, it is almost impossible to analyse in any great depth. However, it is clear that plans shall be made at a Government level, especially for agriculture pollution reduction, which have significant financial and legal implications. The recommendation has therefore been partially fulfilled.

- Recommendation: *Pay special attention in setting thresholds for significance of pressures considering actual impact on the water status as informed by the monitoring data.*

  Assessment: Thresholds for each type of water body are set out and are continuously compared with monitoring data. The recommendation has therefore been fulfilled.

- Recommendation: *Improve the analysis of compliance with the requirements related to the basic measures in the second RBMPs cycle. The RBMPs do not include a comprehensive assessment of compliance with the requirements of Article 11(3)(b-l) WFD*

on the basic measures. It is not clear how much of the gap to the achievement of the WFD objectives is expected to be achieved by the implementation of Article 11(3)(b-l) WFD.

Assessment: In the second RBMPs most of the detailed information provided about cost recovery for water and sewer services is provided by municipality owned Water Utilities. The recommendation has therefore been partially fulfilled.

- Recommendation: *Ensure that Rural Development Programmes provide for sufficient financing of supplementary measures to help reach good status in the second RBMPs. Where this is not provided – further action through basic measures will be necessary.*

Assessment: In the second RBMPs general information is provided suggesting that some support from Rural Development Programmes is available. However, there is no data on the financial support required to achieve the environmental results. The recommendation has therefore been partially fulfilled.

- Recommendation: *Provide complete information on the level of compliance, and timing to reach compliance, by agglomerations, including information on funding, in accordance with Urban Waste Water Treatment Directive (UWWTD) (91/271/EEC) (article 15 and following UWWTD).*

Assessment: In the second RBMPs information is provided on the implementation of the Urban Waste Water Treatment Directive, with each agglomeration described, together with levels of compliance and the amount of time required to achieve compliance. The recommendation has therefore been fulfilled.

- Recommendation: *Ensure compliance with the new Law on Drinking Water Supply and Waste Water Management that was adopted on 12 June 2014 (and came into force on 1 of November 2014) and the Regulation on waste water management: Order D1-515 of Minister of Environment dated 8 October 2007 (environmental requirements for the Individual Appropriate Systems), especially in following aspects: effectiveness of Individual Appropriate Systems reach a level of environmental protection similar to what is requested by the Urban Waste Water Treatment Directive (91/271/EEC), obligation to connect to centralised systems by households, implementing projects of collecting systems, etc.*

Assessment: There is no information concerning the connection to centralised systems in the second RBMPs. However, in Lithuania there is a lot of additional effort to connect households as quickly as possible. The recommendation has therefore been partially fulfilled.

- Recommendation: *Consider and prioritise the use of green infrastructure and/or natural water retention measures that provide a range of environmental (improvements in water quality, flood protection, habitat conservation etc.), social and economic benefits which can be in many cases more cost-effective than grey infrastructure.*

Assessment: No information is provided concerning the prioritisation of green infrastructure in the second RBMPs. The fulfilment of the recommendation can therefore not be assessed.

- Recommendation: *Improve significantly the PoMs for the second RBMP cycle in order to ensure that pressures are linked with appropriate measures.*

Assessment: It would be useful for national RBMPs to follow a similar layout to the European Commission staff working document, as there are is considerable variation between formats, which makes evaluation complicated. For example, the national RBMPs do not contain any information on KTMs. These KTMs appear only in the WISE database, . This recommendation cannot be fully assessed from the information available in WISE reporting and the RBMPs

Topic 10 Measures related to abstractions and water scarcity

10.1 Assessment of implementation and compliance with WFD requirements in the second cycle and main changes in implementation and compliance since the first cycle

10.1.1 Water exploitation and trends

Water abstraction pressures are not reported as relevant for Lithuania. The Water Exploitation Index+ is not calculated, but water quantity data have been reported within Europe's State of Environment report. Water scarcity is not considered an issue at the international level. The RBMPs include a water resource allocation and management plan.

10.1.2 Main uses for water consumption

No data have been reported for the uses of water consumption because water quantity pressures are not reported as significant.

10.1.3 Measures related to abstractions and water scarcity

With respect to basic measures under Article 11(3)(e), in Lithuania there is a permitting regime and a register for groundwater and surface water abstractions, but only for larger volumes than 10 m^3/d. There is a concession, authorisation and/or permitting regime for surface and groundwater to control water impoundment and a register of impoundments, although small abstractions are exempt. Measures under Article 11(3)(c) to promote efficient and sustainable water use have been implemented in the previous cycle. However, no new measures or significant changes are planned. Temporary usage of water, especially from surface water for agriculture and irrigation, requires more precise legal regulation and control. Official data on these type of consumptive uses of water are very limited.

Measures for the prior authorisation of artificial recharge or augmentation of groundwater bodies (Article 11(3)(f)) have been implemented in the previous cycle, but no new measures or significant changes are planned.

Complementary measures under KTMs are reported for addressing abstraction pressures on groundwater in RBDs: KTM14 – 'Research, improvement of knowledge base reducing uncertainty' and KTM21 – 'Measures to prevent or control the input of pollution from urban areas, transport and built infrastructure'. These all target urban water use. The KTMs also seem to close the gap until 2021 according to the indicators reported (pressure indicators seem to drop to zero in 2021) and no further measures are indicated after 2021.

Water reuse is not foreseen as a measure.

10.2 Main changes in implementation and compliance since the first cycle

Measures under Article 11(3)(c) to promote efficient and sustainable water use and measures under Article 11(3)(f) for the prior authorisation of artificial recharge or augmentation of groundwater bodies have been implemented since the first cycle. No other significant changes were observed regarding implementation and compliance since the first cycle.

10.3 Progress with Commission recommendations

There were no Commission recommendations based on the first RBMP and first PoM for this topic.

Topic 11 Measures related to pollution from agriculture

11.1 Assessment of implementation and compliance with WFD requirements in the second cycle

In the first RBMPs, agriculture was indicated as a exerting a significant pressure on the water resources in all four RBDs and this has not changed for the second cycle. The main pressures reported for groundwater were chemical, microbiological and nutrient pollution, as well as diminution of the quality of associated surface waters for chemical or quantitative reasons. For chemical pollution and altered habitats in the surface water bodies of the Nemunas, Venta and Lielupe RBDs, and nutrient and organic pollution in the Daugava, Venta, Lielupe and Nemunas RBDs, KTMs related to agriculture were applied. KTM2 – 'Reduce nutrient pollution from agriculture', KTM12 – 'Advisory services for agriculture', KTM23 – 'Natural water retention measures from agriculture' were applied in all RBDs. It was stated that these measures have already been implemented in the first RBMPs. A gap assessment was not carried out specifically for agricultural measures and it remains unclear how measures are contributing to closing the gap.

As in the first RBMP, the significant agricultural pressures identified in the second RBMPs are chemical and hydromorphological modifications due to land drainage and diffuse pollution of surface waters. Water use for agriculture was indicated as a significant pressure in the first cycle, but not in the second cycle. Also, pressures from slurry storage are identified. The link between pressures and measures has been established.

In Lithuania, measures to reduce leaching from agricultural and arable land are largely integrated into the Water Act (quantitative, time-based and location-based restrictions on fertilizer and manure spreading). These measures are applied the entire territory of Lithuania, as whole country territory assumed as Nitrate vulnerable zone. In the second RBMP period, supervision of these requirements is said to be taking place and it is potentially one of the ways to check if the relevant measures are targeted at the right farmer or right location in the second RBMPs.

Management objectives have been set for nutrient pollution in all RBDs. However, quantitative management objectives in terms of nitrogen load reductions have not been identified. In the second RBMPs the current nutrient load for each river basin was determined, but no nutrient values or required reduction for each RBD were identified. The scheme for reducing nutrient emissions based on the Baltic Marine Environment Protection Commission (HELCOM) Baltic Sea Action Plan has been taken into account.

A gap assessment has been performed for load of nitrogen/phosphorus to be reduced to achieve objectives for 2015. There is also information on the area (ha) of agricultural land where measures regarding the reduction of nutrient loads have to be implemented. No information is provided for pesticides. A gap assessment related to chemical status and hydromorphology has been performed, even if there is no specific link to agriculture.

Basic (the minimum requirement to be complied with) measures under Article 11(3)(h) WFD for the control of diffuse pollution from agriculture at source are applied with different rules across different parts of the RBDs. General binding rules to control diffuse pollution from agriculture are applied in all basins for nitrates, phosphorus and other pollutants.

Mandatory safeguard zones are established around protection areas that are used or intended to be used for drinking water and which have a project-specific daily water abstraction of more than

$10m^3$ or serving more than 50 people. In order to prevent the deterioration of water quality and to protect the facilities of water protection areas, movement is limited, and economic activity restricted, in the area, except for the service of water supply facilities, forest maintenance, mowing (of grasses), and water monitoring. Another objective is to protect the water from diffuse pollution (in particular, nitrogen and phosphorus) for which the relevant measures (obligations, restrictions) are mostly established in national legal acts. In the next RBMP period, a review of these requirements is proposed. In very general terms it is indicated that the actions assigned in the previous PoM (first cycle) have been implemented, although they are mainly measures which are continuous (diffuse pollution) or divided into phases (point-source pollution) which will continue to be implemented in the next RBMP period (second cycle).

Based on the RBMPs and PoMs assessed, additional control measures on land to prevent diffuse pollution have been considered, albeit not very explicitly. It is indicated in the PoMs that with the help of modelling whether the diffuse pollution from agriculture is dominant in total nutrient pollution of a water body will be considered. An additional criterion of relevance used was the (nature) conservation status of a water body. For example, water bodies where the nature conservation regulation calls for habitat restoration are prioritised (considered to be more relevant). The following control measures to prevent diffuse pollution (not necessarily additional) that are presented in the PoMs are:

- additional supervision over compliance with environmental requirements (measures for the protection of surface water and groundwater) in livestock buildings;
- additional control of the misuse of fertilizers (enhanced monitoring);
- supplementary supervision over farm record keeping;
- following the time-based and quantitative restrictions on the application of fertilizer and manure to minimise the nutrient pollution from agricultural land;
- coordination and approval of layout plans for liquid manure storage;
- application of sewage sludge to agricultural land according to set mandatory requirements (the time, location, protection zone, etc.)
- maintaining ‘winter green areas’ or ‘rye fields’ and consideration of a two-metre-wide vegetation buffer zone along the watercourses and water bodies, as well as drainage systems (voluntary).

It was stated in the PoM document that specific measures have been identified for the water body in which these zones are located. No further details were given in supporting documents in relation to safeguard zones. It was stated in the PoM document that, as part of good agricultural practices, it is also recommended to undertake measures aimed at natural sorption and accumulation of nitrates and phosphates introduced into circulation through natural ecosystems. Buffer zones (in the form of rushes, willows or extensively used meadows) present between agricultural areas and water ecosystems contribute to the reduction of surface runoff, as well as significantly limiting or even eliminating the inflow of fertilizers to the groundwater. These measures are not directly regulated by law, but they are an important recommendation from the

standpoint of the need to protect water resources. Buffer zones prevent the flow of nutrients as well as contributing to the preservation of biodiversity. Both the establishment and maintenance of buffer zones, as well as soil liming, are indicated in the national PoM and constitute important measures contributing to the achievement of environmental objectives.

Farmers and Farmers' Unions have been consulted under the public consultation process in all RBDs.

The financing of measures has been secured in all of the RBDs.

11.2 Main changes in implementation and compliance since the first cycle

In the first RBMPs agriculture was identified as exerting a significant pressure on water resources in all RBDs. According to the Nitrates Directive, the entire territory of Lithuania is Nitrate vulnerable zone. The same assessment was in the first RBMP. Obligations and measures of the Nitrates Action Programme apply to all country farmers. Measures implemented are reported to match the pressures in the second cycle. No gap assessment was carried out.

In the next RBMP period, a review of requirements relating to diffuse pollution from agriculture is to take place.

For water bodies for which ecological status is unclear, pollution sources are not clearly identified and/or where no effective measures currently exist, further studies have been and will be implemented.

In the first cycle, financial commitments were not clear. In the second cycle it is reported that the financing of measures is secured for all basins.

11.3 Progress with Commission recommendations

The Commission recommendations based on the first RBMPs and PoM requested action on the following:

- Recommendation: *Quite a lot of effort has gone into understanding diffuse pollution from agriculture. This should be translated into a clear strategy that defines the basic/mandatory measures that all farmers should adhere to and the additional supplementary measures that can be financed. This should be developed with the farmers' community to ensure technical feasibility and acceptance. There needs to be a very clear baseline so that farmers know the rules and the authorities in charge of the CAP funds can adequately set up Rural Development programmes and cross compliance water requirements.*

  Assessment: A set of nation-wide measures, targeting agricultural pollution, have been included in the RBMPs. RBMPs contain compromise measures which were possible to agree on a political and stakeholder level. This recommendation has therefore been partially fulfilled.

- Recommendation: *Present the implementation level of basic and mandatory measures in the second RBMPs cycle. The farming community should be involved and education strengthened on this issue. Lithuania should take into consideration the opportunities provided by the Rural Development Programme.*

Assessment: In the second RBMPs information concerning available Rural Development Programmes and funds allocated for farmers is provided. The recommendation has therefore been partially fulfilled.

- Recommendation: *Ensure a clear strategy that defines the basic/mandatory measures that all farmers should adhere to and the additional supplementary measures that can be financed. Also, Lithuania should ensure a clear baseline so that farmers know the rules and the authorities in charge of Common Agriculture Policy funds can adequately set up Rural Development Programmes and cross compliance water requirements.*

Assessment: These could be good development targets for future generations. The recommendation was therefore not fulfilled.

- Recommendation: *Provide a more detailed assessment in the second RBMP cycle of the percentage of farmers having sufficient slurry/manure storage facilities.*

Assessment: This information was not provided in the second RBMPs. The recommendation was therefore not fulfilled.

- Recommendation: *Collect statistics on the level of farmer compliance with basic measures (an understanding of the level of compliance with basic measures should inform the gap analysis and the preparation of the second RBMP PoMs).*

Assessment: This information was not provided in the second RBMPs. There are draft schedules for additional educational programs, and plans for different support programs for farmers. The recommendation was therefore not fulfilled.

Topic 12 Measures related to pollution from sectors other than agriculture

12.1 Assessment of implementation and compliance with WFD requirements in the second cycle

In the context of this topic, pollution is considered in terms of nutrients, organic matter, sediment, saline discharges and chemicals (Priority Substances, River Basin Specific Pollutants, groundwater pollutants and other physico-chemical parameters) arising from all sectors and sources apart from agriculture. KTMs are groups of measures identified by Member States in their PoMs which target the same pressure or purpose. A KTM could be one national measure but would typically comprise more than one national measure. The same individual measure can also be part of more than one KTM because it may be multipurpose, but also because the KTMs are not completely independent of one another.

KTMs relevant to non-agricultural sources of pressures causing failure of WFD objectives have been reported for all RBDs in Lithuania. The KTMs reported are:

- KTM1 - Construction or upgrades of wastewater treatment plants
- 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
- KTM21 - Measures to prevent or control the input of pollution from urban areas, transport and built infrastructure
- 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
- KTM99 - Other key type measure reported under PoM

The WFD specifies that PoMs shall include, as a minimum, ‘basic measures’ and, where necessary to achieve objectives, ‘supplementary measures’ when basic measures are not enough to address specific significant pressures.

At present, the reporting to WISE states that there are measures in place to eliminate or reduce pollution from Priority Substances and other substances (basic measures Article 11(3)(k) WFD) in all Lithuanian RBDs. Lithuania provided more targeted information on basic measures required under Article 11(3)(c to k) WFD. The use of an authorisation and/or permitting regime to control wastewater point source discharges (basic measures Article 11(3)(g) WFD) was reported for all RBDs for both surface and groundwater. Registers of wastewater discharges (basic measures Article 11(3)(g) WFD) were available in all RBDs for surface and groundwater. Small wastewater discharges are exempt from controls in all RBDs. There is a prohibition of all direct discharges to groundwater in all RBDs.

12.2 Main changes in implementation and compliance since the first cycle

For the first RBMP, monitoring data from up to 2007-2008 was used, and according to the data, the chemical status of all water bodies was assessed as good. Therefore, there were no substance-specific measures in the PoMs. In the second RBMP it was reported that specific Priority

Substances are causing failure to achieve the objectives in all four RBDs and that River Basin Specific Pollutants are causing failure in three out of four RBDs.

Supporting documentation states that the aim of the PoMs in Lithuania is to cease or gradually eliminate the discharge of Priority Substances into the environment.

The RBMP included a summary of measures for Priority Substances. The basic measures included the implementation of the review of water permits for discharge of sewage, including substances for which exceedances were found. In addition, measures were planned to conduct an in-depth analysis of the pressures for those water bodies for which it was impossible to identify the reasons for the exceedances based on currently available data.

There are no measures specifically planned for pollutants causing failure of good chemical status of groundwater. Only general measures have been included, e.g., the implementation and application of groundwater quality standards and threshold values of pollutant concentrations, and implementing measures to prevent or limit the introduction of pollutants into groundwater and prohibition of discharging sewage directly into groundwater. Monitoring of groundwater bodies for chemical status is also listed.

KTM Description	LT1100	LT2300	LT3400	LT4500	General total
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	4	3	4	4	15
General total	**4**	**3**	**4**	**4**	**15**

Source: WISE electronic reports

12.3 Progress with Commission recommendations

There were no Commission recommendations based on the first RBMP and first PoM for this topic.

Topic 13 Measures related to hydromorphology

13.1 Assessment of implementation and compliance with WFD requirements in the second cycle

Significant hydromorphological pressures were identified in all four RBDs. For significant physical alterations and for dams, barriers and locks, the relevant sector or water use was indicated as unknown or obsolete. The significant hydrological and hydromorphological alterations were not assigned to any of the specified sectors according to WISE either (instead the sector was reported as 'other'). Operational KTMs to address these pressures are clearly identified and include:

KTM5 - Improving longitudinal continuity (e.g. establishing fish passes, demolishing old dams)
KTM7 - Improvements in flow regime and/or establishment of ecological flows
KTM23 - Natural water retention measures

Specific measures planned include fish ladders, removal of structures, restoration of bank structures, review of requirements set by hydropower plant management regulations and water use permits, preparation of new regulations and act amendments, as well as several other measures, whose nature as explicit hydromorphological restoration measures, is not clear (for example, defining the reduction of the impact of beaver dams to address river continuity, and cleaning the river).

Overall management objectives and quantitative objectives in terms of restoring river continuity were reported to have been set in all RBDs.

In terms of basic measures, it was reported that there is an authorisation and/or permitting regime in place to control physical modifications in all four RBDs, which covers changes to the riparian area of water bodies according to WFD Article 11(3)(i) WFD. It was also reported that there is a register of physical modifications of water bodies.

The supporting documents to the PoMs indicated that measures were planned to improve the functioning of retention reservoirs, as well as measures related to the adaptation of existing land drainage systems to perform retention functions while maintaining a watercourse for fish migration. In addition, in case of obstacles to fish migration, supplementary measures are included to ensure river continuity (e.g. construction of fish passes).

Ecological flows were derived and implemented partly, i.e., for some relevant water bodies in two RBDs, but the work is still on-going. Ecological flows were not derived for the relevant water bodies but there are plans to do so within the second RBMPs. No information was found in the RBMPs about specific regulations which address the establishment of ecological flows or reference to initiatives for setting new standards to define ecological flows.

Indicators on the gap to be filled for significant hydromorphological pressures and KTM value indicators are reported for 2015 and 2021. Information provided in the WISE reporting shows that there will be considerable progress in closing the gap by 2021 in terms of all types of significant hydromorphological pressures (physical and hydrological alterations, and continuity barriers). However, information from the second RBMPs indicates that many exemptions (extended deadline) set for 2027 are associated with migration barriers and therefore measures to improve fish migration.

13.2 Main changes in implementation and compliance since the first cycle

A major improvement seems to be that a number of hydromorphological measures are clearly reported as operational (KTM5 – 'Improving longitudinal continuity (e.g. establishing fish passes, demolishing old dams', KTM7 – 'Improvements in flow regime and/or establishment of ecological flows' and KTM23 – 'Natural water retention measures') to address significant hydromorphological pressures in the second RBMPs, while in the first RBMPs, no hydromorphological measures had been identified by the time of the adoption of the RBMPs. According to information in the second RBMPs, hydromorphological measures have become more specific in the second cycle compared to the general indications in the first cycle. However, several measures are still not described in specific detail, and presentations remain generic; specific information on the technical measures is only provided for some water bodies.

13.3 Progress with Commission recommendations

The Commission recommendations based on the first RBMPs and PoM requested action on the following:

- Recommendation: *Develop a more ambitious set of measures for the mitigation of major hydromorphological pressures in the second RBMP cycle, such as land drainage, hydropower, flood protection, navigation and deepening of river beds.*

  Assessment: Very limited information is provided in second RBMPs on the relationships between hydromorphological pressures and land drainage, flood protection, and the deepening of river beds. It was indicated that these aspects were not relevant within the Lithuanian context. The recommendation was therefore not fulfilled.

- Recommendation: *Identify and implement no-regret measures. There is no need to have full certainty to take action to restore hydromorphology.*

  Assessment: Some dams will be without fish passages until at least 2027. The recommendation was therefore not fulfilled.

- Recommendation: *Include results of the hydropower plants' study into the second RBMP cycle and include measures based on the results of the study in the second RBMP cycle including as necessary the review of the permits to incorporate mitigation measures.*

  Assessment: An analysis of hydropower plants was included into the second RBMPs. Based on the results there are plans for fish passages, flow regulation, turbine reconstruction, on-line monitoring data, mitigation measure and others. Financial calculations are presented, but no indication of who is responsible for making these investments is provided, and there is no timetable for implementation of the measures foreseen. The recommendation has therefore been partially fulfilled.

Topic 14 Economic analysis and water pricing policies

14.1 Assessment of implementation and compliance with WFD requirements in the second cycle and main changes in implementation and compliance since the first cycle

The definition of water services is associated to abstraction by industry, mining, agriculture, and electricity production. Hydro-energy generation is not defined as a water service. In the second cycle, water services in Lithuania were defined as all services which provide water for households, public institutions or any economic activity. The tariffs for water supply and wastewater treatment in Lithuania are calculated to ensure full recovery of water use costs for households and industry. Cost recovery is assessed for three sectors: public water supply and wastewater treatment, industry and agriculture, and encompassing:

- abstraction, impoundment, storage, treatment and distribution of surface water or groundwater;
- wastewater collection and treatment facilities which subsequently discharge into surface water;
- hydropower; and
- agriculture.

The methodology for the pricing of drinking water supply and wastewater management services approved by the National Control Commission for Prices and Energy defines the principles for setting the tariffs taking into account the principle of full cost recovery.

For the water supply and wastewater treatment sector the revenue from the tariffs was compared to the recovery cost for water supply and wastewater collection and treatment. Calculations were made for each sub-basin and the whole RBD. For industry (with its own water supply and/or wastewater treatment) the potential subsidy schemes were checked and a conclusion was made that practically no subsidies from the EU or the Environmental Investment Fund had been provided. For agriculture a different method was used, but there is a gap and a clear procedure still needs to be developed. Whether the extraction of irrigation water is completely exempted from fees is also not clear.

The water pricing policies provide adequate incentives for users to use water resources efficiently. Additional services where Article 9(4) WFD was applied are flood protection, irrigation and navigation. The justification according to the RBMPs is very short, stating that these services are not included in cost recovery assessment because they are neither typical nor relevant for Lithuania.

Environmental and resource costs are included within the calculation of drinking water supply and wastewater collection and treatment services provided by public Water Utilities and other water services. All water consumption is metered for all consumers: household, industry and agriculture, but only for water supplied by a Water Utility. Individual water supply from groundwater must be metered above 10 m^3/d usage. However, usage of surface water for agriculture and irrigation are not clearly regulated.

Volumetric charging was reported to be in use for drinking water abstraction and wastewater collection and treatment; and hydropower, but only partially for irrigation.

Environmental and resource fees are presented in the second cycle but reported as only partially covered by existing pricing mechanisms (pollution charges). It was reported that more analysis is needed for determining these fees and to assess the needs for additional financial coverage.

The economic analysis is reported as having been updated.

14.2 Progress with Commission recommendations

The Commission recommendations based on the first RBMPs and PoM requested action on the following:

- Recommendation: *The cost-recovery should address a broad range of water services, including impoundments, abstraction, storage, treatment and distribution of surface waters, and collection, treatment and discharge of wastewater, also when they are 'self-services', for instance self-abstraction for agriculture or for households. The cost recovery should be transparently presented for all relevant user sectors, and environment and resource costs shall be included in the costs recovered. Information should also be provided on the incentive function of water pricing for all water services, with the aim of ensuring an efficient use of water. Information on how the polluter pays principle has been taken into account should be provided in the RBMPs.*

Assessment: Cost-recovery is calculated for public Water Utilities. The procedures for cost-recovery are transparent and regulated by the State price regulation commission. However, all other water usage needs much more attention and the adoption of new regulations is required. Particular attention on the regulation of water usage for agriculture, irrigation and aquaculture is required. Environmental and resource fees should be described in more detail and in a transparent way. The recommendation has therefore been partially fulfilled.

- Recommendation: *Ensure that the new legislation on water tariffs requires recovery of costs of water services (water supply and sanitation) taking into account social and economic circumstances, and providing incentives for efficient water use.*

Assessment: There are more than 50 public Water Utilities and at least three different water tariffs exist across the country. Water tariffs recover mainly the operational costs for water services. A key challenge relates to development of new infrastructure and the renovation of existing structures, particularly in relation to small Water Utilities, where new infrastructure costs may not be affordable. Any extension of water and sewer networks are therefore contingent on EU subsidies. The recommendation has therefore been partially fulfilled.

Topic 15 Considerations specific to Protected Areas (identification, monitoring, objectives and measures)

15.1 Assessment of implementation and compliance with WFD requirements in the second cycle

Protected Areas associated with surface water bodies included those related to the Habitats, Birds, Nitrates, Urban Waste Water Treatment (nutrient sensitive areas), Bathing Water and Drinking water (Article 7) Directives and for groundwater bodies, the Nitrates, Urban Waste Water Treatment (nutrient sensitive areas), and Drinking Water Directives. Table 15.1 shows the number of Protected Areas of all types in each RBD of Lithuania for surface water and groundwater bodies. Lithuania has adopted a whole territory designation approach to nitrate sensitive areas under the Urban Waste Water Treatment Directive, therefore nutrient-sensitive areas are not designated for each individual protected area.

Figure 15.1 shows the status of water bodies associated with Protected Areas. For groundwater bodies, 100% were reported to be in good chemical and quantitative status. For surface waters, the situation is different with a large majority of water bodies in good chemical status (with few cases (2%) failing to achieve good status) and 58% of high/good ecological status/potential.

Table 15.1 Number of Protected Areas of all types in each RBD of Lithuania, for surface and groundwater

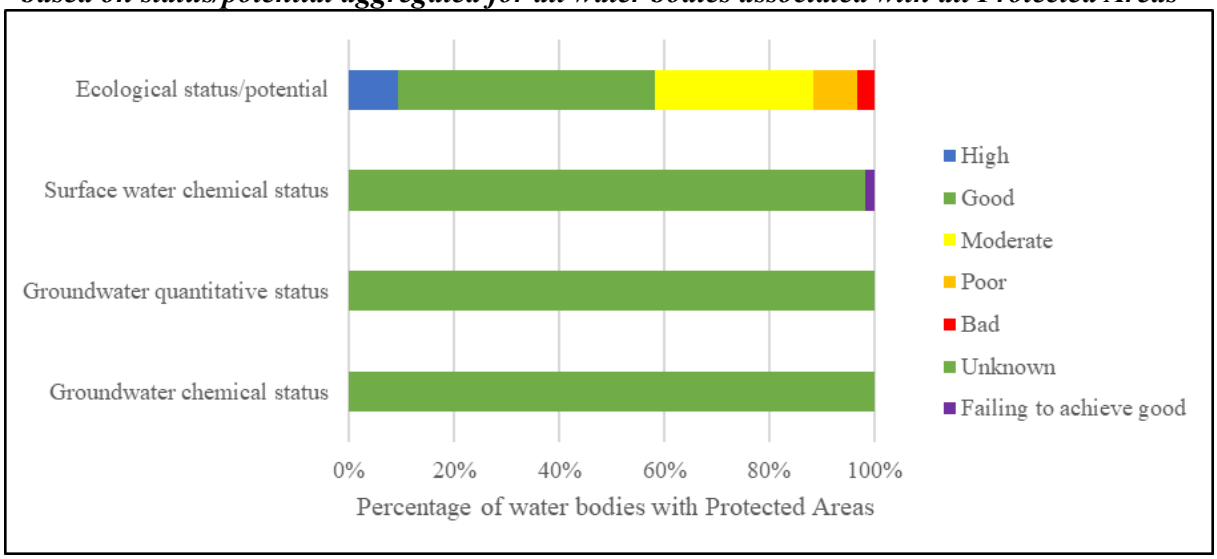
Protected Area type	Number of Protected Areas associated with				
	Rivers	**Lakes**	**Transitional**	**Coastal**	**Groundwater**
Abstraction of water intended for human consumption under Article 7	171	46	6	2	2417
Recreational waters, including areas designated as bathing water under Directive 76/160/EEC	10	51	8	0	0
Protection of species where the maintenance of the status of water is an important factor in their protection, including relevant	54	24	7	2	0

Protected Area type	Number of Protected Areas associated with				
	Rivers	Lakes	Transitional	Coastal	Groundwater
Natura 2000 sites designated under Directive 79/409/EEC (Birds)					
Protection of habitats or species where the maintenance or improvement of the status of water is an important factor in their protection, including relevant Natura 2000 sites designated under Directive 92/43/EEC (Habitats)	136	56	7	2	0
Nutrient-sensitive areas, including areas designated as vulnerable zones under Directive 91/676/EEC (Nitrates Directive) and areas designated as sensitive areas under Directive 91/271/EEC (Urban Wastewater Treatment Directive)	0	0	0	0	0
Areas designated for	0	0	0	0	0

Protected Area type	Number of Protected Areas associated with				
	Rivers	Lakes	Transitional	Coastal	Groundwater
the protection of economically significant aquatic species					
Other	356	195	36	9	0

Source: WISE electronic reports

Figure 15.1 Status of water bodies associated with the Protected Areas report for Lithuania. NB - based on status/potential aggregated for all water bodies associated with all Protected Areas



Source: WISE electronic reports

For all surface water Protected Areas specific additional objectives have been set to protect all dependent habitats and species. However, no information has been provided for water Protected Areas as to whether the objectives have been met, which implies that the monitoring programme may not provide the necessary data for assessing the status of the Protected Areas.

Safeguard zones to protect drinking water have been implemented with a differentiated size approach depending on actual needs. It is not clear from the RBMPs what kind of restrictions are imposed in the safeguard zones.

Monitoring programs are established by virtue of WFD and Birds and Habitats Directives. Good ecological status is considered sufficient to fulfil the requirements of the Birds and Habitats Directives.

Further information on the purpose of monitoring sites for surface water and groundwater status assessment can be found in Chapters 3 and 4 (ecological and chemical status of surface waters) and Chapters 5 and 6 (quantitative and chemical status of groundwaters) of this report.

Table 15.2 Number of monitoring sites associated with Protected Areas in Lithuania

Protected Area Type	Number of Protected Areas associated with				
	Lakes	Rivers	Transitional	Coastal	Groundwater
Abstraction of water intended for human consumption under Article 7	55	241	6	2	2420
Recreational waters, including areas designated as bathing water under Directive 76/160/EEC	51	10	8	0	0
Protection of species where the maintenance of the status of water ia an important factor in their protection, including relevant Natura 2000 sites designated under Directive 79/409/EEC (Birds)	86	207	11	2	0
Protection of habitats or species where the maintenance	119	362	12	2	0
Nutrient-sensitive areas, including areas designated as vulnerable zones under Directive 91/676/EEC (Nitrates Directive) and areas designated as sensitive areas under Directive 91/271/EEC (Urban Wastewater Treatment Directive)	0	0	0	0	0
Areas designated for the protection of economically significant aquatic species	0	0	0	0	0
Other	333	764	44	9	0

Source: WISE electronic reports

Most data was reported regarding quantitative monitoring of groundwater dependent Protected Areas (drinking water only). Status for quantitative and chemical assessment has been carried out with high confidence, and are based on monitoring data.

15.2 Main changes in implementation and compliance since the first cycle

For Drinking Water Protected Areas associated with groundwater bodies there was an increase of monitoring sites, since the previous cycle, and for Bathing Waters and Habitats Directive Areas associated with surface water bodies there was also an increase.

15.3 Progress with Commission recommendations

The Commission recommendations based on the first RBMPs and PoM requested action on the following:

- Recommendation: *Identify additional measures as needed and planned in the protected areas and set additional objectives for the areas on drinking water.*

Assessment: No additional measures are planned and indicated in second RBMPs. Drinking water relies upon groundwater sources. However, groundwater quality is of good status and no threats are foreseen in the near future. Additional objectives are therefore not needed. The recommendation has therefore been partially fulfilled.

- Recommendation: *Ensure that the assessment of additional objectives is carried out in particular for Protected Areas designated for the protection of species and habitats for the second RBMPs. These objectives need to be clearly identified and included in the plans and Lithuania should ensure better integration of the second RBMP for Protected Areas with, in particular Natura 2000 Plans.*

Assessment: Additional objectives are identified for Protected Areas designed for protection of species and habits within the second RBMPs. These objectives are general and not specifically associated to a particular Protected Area. Additionally, objectives are

not integrated with Natura 2000 Plans. The recommendation has therefore been partially fulfilled.

- Recommendation: *Identify the measures needed for the additional objectives identified in Protected Areas, include them in the second RBMP cycle and ensure links with the Natura 2000 Management Plans.*

Assessment: There are no indentified measures for Protected Areas and they are not associated with Nature 2000 Management Plans. There are also no Management plans for Protected Areas - only objectives in relation to Protected Areas are presented in the second RBMPs. The recommendation was therefore not fulfilled[18].

[18] Lithuania subsequently informed that the measures to achieve the objectives for which protected areas were created have been included in the management plans of those protected areas in accordance to their specific legislation, not under the WFD. Lithuania checks whether the WFD objectives do not contradict those of protected areas (NATURA2000 sites in particular). Lithuania informed that more detailed information on protected areas was included in separate documentation supporting RBMPs

Topic 16 Adaptation to drought and climate change

16.1 Assessment of implementation and compliance with WFD requirements in the second cycle

Climate change was considered in all RBDs and it is stated that the guidance on how to adapt to climate change (Common Implementation Strategy Guidance Document No. 24[19]) was used. In the first RBMPs no climate change evaluation of the PoMs was carried out. Such an evaluation was however carried out for the second RBMPs. Consideration of climate change has been included in the assessment process for evaluating the effectiveness of measures and assessing direct and indirect climatic pressures. No specific sub-plans for addressing climate change were reported for Lithuania. KTM 24 - 'Adaptation to climate change' is not reported as operational to address any of the significant pressures.

According to the 2012 Topic Report on Water Scarcity and Drought in RBMPs, droughts are not relevant for the country. No exemptions have been applied following Article 4(6) due to prolonged droughts.

Even though there is no legal obligation to prepare Drought Management Plans, many Member States have prepared them in order to cope with droughts. However, no Drought Management Plans have been developed in Lithuania. This situation is similar to the first cycle (Topic report on: Assessment of Water Scarcity and Drought aspects in a selection of EU River Basin Management Plans).

16.2 Main changes in implementation and compliance since the first cycle

A climate change evaluation check was carried out in the second RBMPs. This was not the case in the first RBMPs.

16.3 Progress with Commission recommendations

There were no Commission recommendations based on the first RBMPs and first PoM.

[19] 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
http://ec.europa.eu/environment/water/quantity/pdf/Assessment%20WSD.pdf