Programme of Measures for Achieving Water Protection Objectives within the Lielupė River Basin District
Annex 2

RATIONALE FOR THE PROGRAMME OF MEASURES FOR ACHIEVING WATER PROTECTION OBJECTIVES WITHIN THE LIELUPĖ RIVER BASIN DISTRICT

CHAPTER I. GENERAL PROVISIONS

1. The Programme is designed for the Lielupė River Basin District (RBD) which consists of the Lithuanian parts of the Mūša, Nemunėlis and Lielupė Small Tributaries basins.

The Programme was drawn up upon analysis of the status of water bodies within the Lielupė RBD and assessment of impacts of anthropogenic activities on water bodies. The development of the Programme took account of the programmes currently implemented on the national level as well as technical feasibility of the measures and economic resources, including recovery of costs related to the provision of water services.

Pursuant to the requirements of the Law of the Republic of Lithuania on Water (Žin.[*], 1997, No. 104-2615; 2003, No. 36-1544), a programme of measures must be established for each river basin district in order to achieve water protection objectives. Each programme of measures comprises basic measures which are the mandatory requirements under the Lithuanian laws regulating the water sector and relevant European Union (EU) directives (construction of wastewater treatment facilities and manure storage facilities, balanced soil fertilisation, crop rotation, etc.). Where the assessment of the effect of the basic measures reveals that they are sufficient for achieving water protection objectives, the programme is limited to these measures. If, however, the basic measures are not sufficient for a water body to achieve water protection objectives, supplementary measures are then chosen as may be necessary in order to attain the set water protection objectives.

A wide range of measures can be available. Some of them are purely engineering ones, for example, construction of domestic and industrial wastewater treatment facilities, installation of protection belts for water bodies, renaturalisation of straightened river beds, etc. Other instruments are legal (permits for carrying out economic activities, impoundment of rivers or construction of hydropower plants (HPP), etc.), economic (taxes and charges, sanctions, incentives, subsidies and the like), information (seminars, events, public education through the press, on the internet), etc.

Legal acts provide for possible exceptions in respect of the achievement of certain water protection objectives. One of them is the extension of the deadline (until 2027 at the latest) for achieving the set objective, provided that the objective cannot be achieved in time for reasons of technical feasibility, disproportionate costs or natural conditions. Another exception is the establishment of less stringent objectives that must also be justified by technical feasibility, natural conditions or disproportionate costs, as well as

[*] *Valstybės žinios* [official gazette]

when the achievement of good status would lead to far-reaching negative socio-economic consequences that cannot be avoided by any significantly better environmental option. These exceptions can be applied only in rare cases, subject to the economic analysis and reasoned arguments for the necessity of the exception.

The present document on the Programme of Measures for the Lielupė RBD gives a description of the basic and supplementary measures, as well as specifies the costs of their implementation.

CHAPTER II. BASIC MEASURES FOR ACHIEVING GOOD WATER STATUS IN THE LIELUPĖ RBD

Taking into account that the implementation of the basic measures has been regulated in relevant legislation currently in force as well as in programmes and various other documents, the requirements of the basic measures which have already been transposed into the national legal framework are not specified in this Programme to avoid repetition of these requirements in different documents.

2. Pursuant to Part A of Annex VI to Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy (OJ 2004 special edition, Chapter 15, Volume 5, p. 275), (WFD), basic measures are those which must be implemented in order to meet the requirements of the following directives:

2.1 Directive 2006/7/EC of the European Parliament and of the Council of 15 February 2006 concerning the management of bathing water quality and repealing Directive 76/160/EEC (OJ 2006 L 64, p. 37) (Bathing Water Directive);

2.2. Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (OJ 2010 L 20, p. 7) (Birds Directive);

2.3 Council Directive 98/83/EC of 3 November 1998 on the quality of water intended for human consumption (OJ 2004 special edition, Chapter 15, Volume 4, p. 90), (Drinking Water Directive);

2.4. Council Directive 96/82/EC of 9 December 1996 on the control of major-accident hazards involving dangerous substances (OJ 2004 special edition, Chapter 5, Volume 2, p. 410) (Major Accidents Directive);

2.5. Council Directive 85/337/EEC of 27 June 1985 on the assessment of the effects of certain public and private projects on the environment (OJ 2004 special edition, Chapter 15, Volume 1, p. 248) as last amended by Directive 2009/31/EC of the European Parliament and of the Council of 23 April 2009 (Environmental Impact Assessment Directive);

2.6. Council Directive 86/278/EEC of 12 June 1986 on the protection of the environment, and in particular of the soil, when sewage sludge is used in agriculture (OJ 2004 special edition, Chapter 15, Volume 1, p. 265) (Sewage Sludge Directive);

2.7. Council Directive 91/271/EEC of 21 May 1991 concerning urban waste water treatment (OJ 2004 special edition, Chapter 15, Volume 10 p. 26) (Urban Wastewater Treatment Directive);

2.8. Council Directive 91/414/EEC concerning the placing of plant protection products on the market (OJ 2004 special edition, Chapter 3, Volume 11, p. 332) as last amended

by the Commission Directive 2010/42/EU of 28 June 2010 (OJ 2006 L 161, p. 6) (Plant Protection Products Directive);

2.9. Council Directive 91/676/EEC of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources (OJ 2004 special edition, Chapter 15, Volume 2, p. 68) (Nitrates Directive);

2.10. Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora of 21 May 1992 (OJ 2004 special edition, Chapter 15, Volume 2, p. 102) (Habitats Directive);

2.11. Directive 2008/1/EC of the European Parliament and of the Council concerning integrated pollution prevention and control of 15 January 2008 (OJ 2008 L 24, p. 8), as last amended by Directive 2009/31/EC of the European Parliament and of the Council of 23 April 2009 (OJ 2009 140, p. 114) (IPPC Directive).

Seven directives out of the eleven ones listed above the implementation of which also means introduction of the basic measures are related to high costs. The largest investments are required for the Urban Wastewater Treatment Directive and the Nitrates Directive therefore these directives are addressed on a first priority basis in the sections below. The implementation of the remaining directives – the Birds Directive, Environmental Impact Assessment Directive, Plant Protection Products Directive, and the Habitats Directive – is mainly related to the establishment of relevant legal, institutional, procedural and other "soft" measures with a lower investment demand.

SECTION I. MEASURES PROVIDED FOR IN THE COMMUNITY WATER LEGISLATION AND TRANSPOSED INTO THE LITHUANIAN LEGAL FRAMEWORK

Urban Wastewater Treatment Directive

3. The basic measures under the Urban Wastewater Directive cover construction and reconstruction of wastewater treatment facilities in agglomerations with a population equivalent (p.e.) of more than 2 000 with a view to improve the quality of discharged wastewater so that it conforms to the requirements set for effluents emitted into surface water bodies. The said requirements are defined in the Wastewater Management Regulation. Although loads discharged from urban wastewater treatment plants (WWTP) have significantly decreased during the recent years, pollutants emitted from some of them continue significantly affecting the quality of the receiving water bodies.

The measures required for the implementation of the Urban Wastewater Treatment Directive are one of the most important and investment-intensive basic measures which usually result in improvement of surface water quality. All basic measures under the Urban Wastewater Treatment Directive either are being implemented or are supposed to be implemented in Lithuania by 2010.

The key piece of legislation transposing the Urban Wastewater Treatment Directive is the Law of the Republic of Lithuania on Water, which started regulating treatment of wastewater.

Later, the following legislation was passed:

3.1. Law of the Republic of Lithuania on Drinking Water Supply and Wastewater Management (Žin., 2006, No. 82-3260);

3.2. Law of the Republic of Lithuania on the Entry into Force and Implementation of the Law on Drinking Water Supply and Wastewater Management (Žin., 2006, No. 82-3261);

3.3. Drinking Water Supply and Wastewater Management Development Strategy for 2008–2015 approved by Resolution No. 832 of the Government of the Republic of Lithuania of 27 August 2008 (Žin., 2008, 104-3975);

3.4. Wastewater Management Regulation;

3.5. List of National Projects No. 1 under Measure No. VP3-3.1-AM-01-V "Renovation and development of water supply and wastewater management systems" approved by Order No. D1-462 of the Minister of Environment of the Republic of Lithuania of 9 September 2008 (Žin., 2008, No. 109-4162; 2009, No. 47-1882).

4. Under the EU Treaty of Accession, Lithuania has been granted a transitional period for the implementation of the requirements of the Urban Wastewater Treatment Directive. Lithuania has undertaken to collect and adequately treat wastewater observing the following schedule:

4.1. wastewater in agglomerations with a p.e. of 10 000 and more shall be treated observing the established standards as from 31 December 2007;

4.2. wastewater collection systems in conformity with the established requirements shall be in place in agglomerations with a p.e. of more than 2 000 as from 31 December 2009;

4.3. wastewater shall be treated observing the established standards in agglomerations of between 2 000 and 10 000 as from 31 December 2009;

4.4. in newly planned agglomerations, wastewater management requirements shall be observed from the moment of the wastewater generation.

Effect of the measures under the Urban Wastewater Treatment Directive

5. There are 12 agglomerations with a p.e. of more than 2 000 in the Lielupė RBD on a list drawn up by the Environmental Protection Agency (EPA). The wastewater treatment plants (WWTP) of these agglomerations are the main objects actually subject to the requirements of the Urban Wastewater Treatment Directive.

The volumes and quality parameters of wastewater discharged from the agglomerations with a p.e. of more than 2 000 in the Lielupė RBD and conformity thereof with the requirements of the Urban Wastewater Treatment Directive are provided in Table 1 below.

Table 1. Quality parameters of wastewater discharged from large agglomerations with a p.e. of more than 2 000 in the Lielupė RBD. Concentrations which fail the requirements of the Urban Wastewater Treatment Directive are given in bold italics.

Town	Agglomeration size	Receiving water body	Wastewater volume, thou. m^3/m	BOD_7* mg/l	NH_4-N * mg/l	NO_3-N* mg/l	N_{total}* mg/l	P_{total} * mg/l
Šiauliai	> 100 000	Kulpė	7296	3.6	0.546	5.16	***11***	0.18
Biržai	10000 – 100000	Tatula	804	2.9	0.07	7.123	8.75	0.206
Kupiškis	10000 – 100000	Lėvuo	508	10.9	3.5	1.96	8.4	1.03
Pasvalys	10000 – 100000	Lėvuo	681.1	15.7	3.7	5.9	14.7	***2.9***
Radviliškis	10000 – 100000	Obelė	840	3.1	0.09	8.3	12	1.38

Town	Agglomeration size	Receiving water body	Wastewater volume, thou. m^3/m	BOD_7* mg/l	NH_4-N * mg/l	NO_3-N* mg/l	N_{total}* mg/l	P_{total} * mg/l
Joniškis	10000 – 100000	Sidabra	413	10	30.1	0.152	***34.4***	0.86
Joniškis	10000 – 100000	Sidabra	244	6.9	3.02	9.49	***18.4***	1.68
Joniškis	10000 – 100000	Sidabra	31	4.4	0.055	5.29	9.7	0.35
Rokiškis	10000 – 100000	Laukupė	1033	13.1	0.3	6	10.74	1.19
Linkuva	2000 - 10000	Mūša	28	4.63	5.36	24.52	56.63	8.23
Pakruojis	2000 – 10000	Mūša	299	3.98	0.97	0.81	6.3	0.16
Šeduva	2000 – 10000	Niauduva	24	4	3.8	6	10.3	7.51
Šeduva	2000 - 10000	Niauduva	59	6	66	2.11	79	8.02
Žagarė	2000 - 10000	Švėtė	11	18	18.4	2.65	33.8	2.77
Juodupė	2000 - 10000	Juodupė	135.6	5.49	0.59	14.09	20.12	1.84

∗BOD_7 – biochemical oxygen demand for 7 days; NH_4-N – ammonium nitrogen; NO_3-N – nitrate nitrogen; N_{total} – total nitrogen; P_{total}- total phosphorus
Source: 2009 data on point pollution loads (EPA)

Not all WWTP in agglomerations with a p.e. of more than 2 000 were meeting the wastewater quality requirements under the Urban Wastewater Treatment Directive in the Lielupė RBD: concentrations of total nitrogen were exceeded in wastewater in Šiauliai city, though the exceedance was rather small – the average maximum allowable concentration (MAC) for agglomerations of this size is 10 mg/l and the average measured concentration in effluents was 11 mg/l.

Another agglomeration discharges from which were still failing, as in previous years, the requirements of the Urban Wastewater Treatment Directive is Pasvalys because the average annual concentrations of total phosphorus (2.9 mg/l) was higher than the average annual MAC set for the agglomeration of this size (2 mg/). Pasvalys WWTP is currently undergoing reconstruction which is planned to be completed in 2010. It is forecasted that concentrations of P_{total} after the reconstruction will be meeting the requirements of the Urban Wastewater Treatment Directive.

Reconstruction of Joniškis WWTP was completed in December 2009. Before the reconstruction, part of wastewater discharged therefrom in 2009 were still failing the requirements of the Urban Wastewater Treatment Directive – concentrations of N_{total} (18.4 – 34.4 mg/l) were higher than the allowed one (15 mg/l). After the reconstruction, concentrations of nitrogen compounds in effluents discharged from Joniškis WWTP have gone down to the required level. Although some adjustments are still going on in these treatment facilities, it is expected that the present high level of treatment will be retained in future.

The reconstruction of the said wastewater treatment facilities is carried out under Project No. 2006/LT/16/C/PE/001 “Investment Programme for the Venta – Lielupė River Basin, 1st stage”, which is implemented by the Environmental Project Management Agency under the Ministry of Environment of the Republic of Lithuania.

Reconstruction of Šeduva WWTP was completed in December 2009. During the transitional period of the reconstruction, high concentrations of total nitrogen and ammonium compounds (N_{total} – 79 mg/l, NH_4-N – 66 mg/l) were registered in effluents discharged from Šeduva WWTP. Though special technologies for the removal of nitrogen compounds were not introduced during the reconstruction, concentrations of nitrogen compounds in the effluents noticeably went down: the average concentration of

total nitrogen was 10.3 mg/l, NH_4-N – 3,8 mg/l, NO_3-N – 6 mg/l. It is expected that the present concentrations of nitrogen compounds in treated wastewater will be retained in future.

The scope of the implementation of the basic measures was assessed taking into account the available information of projects already completed and those planned for the future and assuming the following:

5.1. The concentration of total phosphorus in effluents discharged from Šiauliai WWTP will go down to the required level (i.e. will not exceed 10 mg/l); other wastewater quality parameters will remain the same.

5.2. The reconstruction of Pasvalys WWTP will result in the required level of removal of total phosphorus, i.e. concentrations of total phosphorus in effluents will not be exceeding 2 mg/l; concentrations of total nitrogen will remain the same as today, however, the larger part of ammonium nitrogen compounds will be nitrified to nitrates. Taking into account the parameters of the reconstructed wastewater treatment facilities in Joniškis, it was assumed that ammonium nitrogen will account for 1% and nitrate nitrogen – up to 55% of total nitrogen.

5.3. The wastewater treatment level achieved as a result of the reconstruction of wastewater treatment facilities in Joniškis and Šeduva is expected to be retained in future.

5.4. Concentrations of total phosphorus in effluents discharged from Linkuva and Žagarė WWTP will go down to 2 mg/l and those of total nitrogen – to 20 mg/l.

5.5. Quality parameters of wastewater discharged from other large agglomerations (Biržai, Kupiškis, Radviliškis, Rokiškis, Pakruojis, Juodupė), where the basic requirements of the Urban Wastewater Treatment Directive have been already introduced and wastewater treatment facilities are operating efficiently, will not change and will remain the same as in 2009.

5.6. The volume of wastewater discharged from large agglomerations will not change and will remain the same as in 2009.

5.7. The loads of other dischargers (i.e. dischargers of industrial wastewater, surface runoff and wastewater from settlements with a p.e. of less than 2 000) will not change and will remain the same as in 2009.

The loads currently discharged into surface water bodies within the Lielupė RBD from point pollution sources and loads forecasted after the implementation of the basic measures under the Urban Wastewater Treatment Directive are presented in Table 2. The present point pollution loads were assessed using the EPA data of 2009.

The information given in Table 2 demonstrates that point pollution reduction can be expected only in the Mūša and Lielupė Small Tributaries sub-basins, meanwhile point pollution loads in the Nemunėlis Sub-basin are expected to remain the same as today. The reduction of pollution loads in the Lielupė Basin as compared to the ones in 2009 will be achieved due to the reconstruction of wastewater treatment facilities in Kuršėnai and Telšiai and the construction of new wastewater treatment facilities in Akmenė and Naujoji Akmenė. According to forecasts, the decrease in the BOD_7 load in the Mūša Sub-basin will be very insignificant, the load of total nitrogen may go down by % and that of total phosphorus – by 8%. The BOD_7 load discharged from point pollution sources in the Lielupė Small Tributaries Sub-basin is likely to go down by 30%, , the

load of total nitrogen – by 43% and that of total phosphorus – by 31% as compared to the previous years.

Table 2. Present and forecasted point pollution loads in the Lielupė RBD after the implementation of the basic measures under the Urban Wastewater Treatment Directive

Pollutant	Discharger	Sub-basin					
		Lielupė Small Tributaries		Mūša		Nemunėlis	
		Present load	Forecasted load after the implementation of the basic measures under the Urban Wastewater Treatment Directive	Present load	Forecasted load after the implementation of the basic measures under the Urban Wastewater Treatment Directive	Present load	Forecasted load after the implementation of the basic measures under the Urban Wastewater Treatment Directive
BOD_7, t/year	Agglomerations of > 100 000 p.e.	0	0	26.3	26.3	0	0
	Agglomerations of between 10 000 and 100 000 p.e.	6	3	21.2	21.2	13.5	13.5
	Agglomerations of between 2 000 and 10 000 p.e.	0.2	0.2	1.8	1.6	0.7	0.7
	Agglomerations of <2 000 p.e.	1.9	1.9	9.1	9.1	2.9	2.9
	Industrial wastewater	0.9	0.9	1.5	1.5	9.2	9.2
	Surface runoff	0.9	0.9	4.9	4.9	12.3	12.3
	TOTAL:	**9.9**	**6.9**	**64.8**	**64.6**	**38.6**	**38.6**
Total nitrogen, t/year	Agglomerations of > 100 000 p.e.	0	0	80.3	73	0	0
	Agglomerations of between 10 000 and 100 000 p.e.	19	6.7	31.4	31.4	11.1	11.1
	Agglomerations of between 2 000 and 10 000 p.e.	0.4	0.2	8.4	3.3	2.7	2.7
	Agglomerations of <2 000 p.e.	5.3	5.3	15.6	15.6	4.6	4.6
	Industrial wastewater	2.9	2.9	2.7	2.7	6.8	6.8
	Surface runoff	1.2	1.2	5.6	5.6	8.3	8.3
	TOTAL:	**28.8**	**16.3**	**144**	**131.6**	**33.5**	**33.5**
Total phosphorus, t/year	Agglomerations of > 100 000 p.e.	0	0	1.3	1.3	0	0
	Agglomerations of between 10 000 and 100 000 p.e.	0.8	0.24	3.8	3.2	1.23	1.23
	Agglomerations of between 2 000 and 10 000 p.e.	0.03	0.02	0.9	0.7	0.25	0.25
	Agglomerations of <2 000 p.e.	0.5	0.5	2.3	2.3	0.64	0.64
	Industrial wastewater	0.3	0.3	0.2	0.2	2.3	2.3
	Surface runoff	0.06	0.06	1.2	1.2	1.3	1.3
	TOTAL:	**1.69**	**1.12**	**9.7**	**8.9**	**5.72**	**5.72**

Source: experts' estimations taking into account the data on point pollution loads in 2009 (EPA) and information about water purification projects already completed and those planned for the future

Implementation costs of the Urban Wastewater Treatment Directive

6. A lot of various funds have been allocated for the implementation of the Urban Wastewater Treatment Directive in Lithuania up to now. However, it has been decided that the costs of the basic scenario under the WFD are those incurred under the financial perspective for 2007-2013 (in line with the List of National Projects No. 1 under Measure No VP3-3.1-AM-01-V "Renovation and development of water supply and wastewater management systems". In the Lielupė RBD, the funds from the financial perspective for 2007-2013 are planned to be used for the construction of five new wastewater treatment plant and 133.1 km of new sewerage networks and reconstruction of 6.8 km of the existing sewerage networks. The costs of the implementation of the Urban Wastewater Treatment Directive are further specified by individual sub-basins.

Mūša Sub-basin

7. Planned measures in the Mūša Sub-basin include reconstruction of four wastewater treatment facilities, construction of 81 km of new and reconstruction of 6.8 km of the existing sewerage networks. Table 3 below provides data on the national projects on the renovation and development of water supply and wastewater management systems in the Mūša Sub-basin in 2007-2013. The investment costs given therein also cover the costs of the implementation of the Drinking Water Directive. The total investment costs in the Mūša Sub-basin are estimated at LTL 165.14 million.

Table 3. National projects on renovation and development of water supply and wastewater management systems in the Mūša Sub-basin in 2007-2013

Municipality	Settlement	Planned works							Project value, LTL million	Maintenance costs, LTL million per year
		New WWTP, unit	Renovated WWTP, unit	New sewerage networks, km	Renovated sewerage networks , km	New water supply networks, km	Renovated water supply networks, km	New/renovated water supply networks, km		
Kupiškis distr.	Kupiškis		1	4.2		4.8			16.744	
	Aukštupėnai			3.4		1.0				
Pakruojis distr.	Pakruojis		1	6.4		3.5		1	31.0	
	Linkuva		1	10.5		6.1				
Pasvalys distr.	Pasvalys			3.3		0.7			2.8	
Radviliškis distr.	Radviliškis			3.1		3.0			3.146	
Šiauliai city distr.	Šiauliai			25.0		23.0			72.0	
Šiauliai distr.	Šiauliai		1						20.41	
	Ginkūnai			12.2	3.9	4.3	4.0			
Šiauliai distr.	Kairiai			11.0	2.9	8.7	2.1		19.04	
	Vijoliai			1.9		1.9				
TOTAL			**4**	**81.0**	**6.8**	**57.0**	**6.1**	**1**	**165.14**	**3.3**

Source: List of National Projects No. 1 under Measure No VP3-3.1-AM-01-V "Renovation and development of water supply and wastewater management systems"

Notes:

1. Development of Radviliškis water supply and wastewater infrastructure is included in the project "Development of the water supply and wastewater management infrastructure in Radviliškis district". The project also includes development of the infrastructure in Baisogala settlement (Nemunas RBD, Nevėžis Sub-basin). The total value of the project is LTL 6.291 million. It is assumed that half of the project amount will be invested in the Mūša Sub-basin
2. Development of Kairiai and Vijoliai (Šiauliai district) water supply and wastewater infrastructure is included in the project "Development of the water supply and wastewater management infrastructure in Šiauliai district (Kairiai, Vijoliai, Kuršėnai)". The project also includes development of the infrastructure in Kuršėnai settlement (Venta RBD). The total value of the project is LTL 28.56 million. It is assumed that two thirds of the project value will be invested in the Mūša Sub-basin.
3. Since most of the investments are planned for networks, it is assumed, following the practice of already completed investment projects, that the annual operating costs account for 2% of the investment costs.
4. The table above specifies the minimum length and other technical parameters of the networks to be constructed or reconstructed. These parameters are most likely to go up during the implementation of the projects de to decreased construction prices.

Nemunėlis Sub-basin

8. Planned measures in the Nemunėlis Sub-basin include construction 29.1 km of new sewerage networks. Table 4 below provides data on the national projects on the renovation and development of water supply and wastewater management systems in the Nemunėlis Sub-basin in 2007-2013. The investment costs given therein also cover the costs of the implementation of the Drinking Water Directive. The total investment costs in the Mūša Sub-basin are estimated at LTL 26.67 million. Following the practice of already completed investment projects, it is assumed that the annual operating costs account for 2% of the investment costs.

Table 4. National projects on renovation and development of water supply and wastewater management systems in the Nemunėlis Sub-basin in 2007-2013

Municipality	Settlement	Planned works							Project value, LTL million	Maintenance costs, LTL million per year
		New WWTP, unit	Renovated WWTP, unit	New sewerage networks, km	Renovated sewerage networks , km	New water supply networks, km	Renovated water supply networks, km	New/renovated water supply networks, km		
Biržai distr.	Biržai			18.0		5.9			16.73	
Rokiškis distr.	Rokiškis			11.1		3.1			9.94	
TOTAL				**29.1**		**9.0**			**26.67**	**0.53**

Source: List of National Projects No. 1 under Measure No VP3-3.1-AM-01-V "Renovation and development of water supply and wastewater management systems"

Lielupė Small Tributaries Sub-basin

9. Planned measures in the Lielupė Small Tributaries Sub-basin include construction of one new wastewater treatment plant and construction of 23 km of new sewerage networks. Table 5 below provides data on the national projects on the renovation and development of water supply and wastewater management systems in the Lielupė Small Tributaries Sub-basin in 2007-2013. The investment costs given therein also cover the

costs of the implementation of the Drinking Water Directive. The total investment costs in the sub-basin are estimated at LTL 37.8 million. Following the practice of already completed investment projects, it is assumed that the annual operating costs account for 2% of the investment costs.

Table 5. National projects on renovation and development of water supply and wastewater management systems in the Lielupė Small Tributaries Sub-basin in 2007-2013

Municipality	Settlement	Planned works							Project value, LTL million	Maintenance costs, LTL million per year
		New WWTP, unit	Renovated WWTP, unit	New sewerage networks, km	Renovated sewerage networks , km	New water supply networks, km	Renovated water supply networks, km	New/renovated water supply networks, km		
Joniškis distr.	Joniškis			8.0		7.1			15.1	
Joniškis distr.	Žagarė	1		15.0		12.4			22.7	
TOTAL		**1**		**23.0**		**19.5**			**37.8**	**0.76**

Source: List of National Projects No. 1 under Measure No VP3-3.1-AM-01-V "Renovation and development of water supply and wastewater management systems"

Nitrates Directive

10. The objective of the Nitrates Directive is to reduce pollution of water bodies generated or induced with nitrates used in agriculture and to prevent such pollution in future.

The key piece of legislation transposing the Nitrates Directive is the Programme on the Reduction of Water Pollution from Agricultural Sources approved by Order No. 3D-686/D1-676 of the Minister of Agriculture of the Republic of Lithuania and the Minister of Environment of the Republic of Lithuania of 9 December 2008 (Žin., 2008, No. 143-5741), which is the document regulating the second stage of the Programme. The first stage ended in 2007 and the second one will last until May 2012.

Effect of the measures under the Nitrates Directive

11. The effect of the measures under the Nitrates Directive was assessed forecasting changes in the status of water bodies as a result of the implementation of the said measures, which was done with a help of mathematical modelling. Changes in the water status as compared to the present situation were assessed taking into account the effectiveness and extent of the implementation of the planned measures.

A list of the key measures under the Nitrates Directive as well as prospects and extent of the implementation of the measures in Lithuania are provided in Table 6, which also gives information on the effect and effectiveness of the measures.

However, it is rather difficult to determine the effect of each measure because it depends on a number of factors, such as natural conditions, farming methods and type. Accordingly, the effectiveness of the measures may differ from farm to farm. The effectiveness values used for the forecasting of the impact of the Nitrates Directive were determined on the basis of summary results of studies conducted in other countries (UK and Denmark).

The table below demonstrates that many basic measures under the Nitrates Directive will have either no or only a minor impact on pollution loads. The main measure which is expected to have a noticeable effect is construction of manure storages on farms with more than 10 livestock units (LSU).

Table 6. Basic measures under the Nitrates Directive and their effectiveness

No.	Requirement	Application	Impact on pollution loads	Expected decrease in pollution loads after implementation of the measure, %
1	Construction of manure storages on farms (except for those with deep animal houses). Capacity of the manure storage (of the pit, tank or lagoon type) shall be 8 months for storing manure from pigs and poultry and 6 months for storing manure from cattle, horses, sheep and other animals.	Farms with more than 300 LSU - by 1 January 2008	Loads of nitrate nitrogen and total phosphorus will go down on farms with more than 300 LSU. When manure is spread at the time of the lowest likelihood of surface runoff, reduction of NH_4-N and biochemical oxygen demand (BOD) can be expected. The measure is effective only when manure is spread at a suitable time and at a safe distance from water bodies. The measure has been partially implemented.	It is assumed that pollution loads on farms with manure storages are 20% lower than on farms without such storages.
2	Construction of manure storages on farms (except for those with deep animal houses). Capacity of the manure storage (of the pit, tank or lagoon type) shall be 8 months for storing manure from pigs and poultry and 6 months for storing manure from cattle, horses, sheep and other animals.	Farms with 10 to 300 LSU by 1 January 2012.	Loads of NO_3-N and P_{total} will go down on farms with more than 10 LSU. When manure is spread at the time of the lowest likelihood of surface runoff, reduction of NH_4-N and BOD loads can be expected. The measure is effective only when manure is spread at a suitable time and at a safe distance from water bodies.	Livestock pollution loads will go down by 20-30% on farms where this measure will be applied.
3	The amount of N_{total} entering the soil (when fertilising it with organic fertilisers (OF), and pasturing livestock) shall not exceed 170 kg/ha.	All livestock farms	This measure will have either no or only a minor effect, because according to the available data the load of 170 kg/ha is currently not exceeded.	No decrease
4	Organic fertilisers shall not be used between 1 December and 1 April and shall not be applied when the soil is frozen hard, waterlogged or snow covered. In exceptional cases, when autumn is dry, warm and long and fields are ploughed later, or when spring is early and warm and fields are ploughed earlier, organic fertilisers may be applied later or earlier, upon prior notification of the regional environmental protection agency of the relevant Regional Environmental Protection Department (REPD) thereof. Such fertilisation shall be prohibited when the wind is blowing in the direction of a neighbouring residential place.	All livestock farms	It is assumed that application of organic fertilisers on hard-frozen fields is not widely spread because the demand of fertilisers for crops is minimum at this time of the year.	No decrease

No.	Requirement	Application	Impact on pollution loads	Expected decrease in pollution loads after implementation of the measure, %
	Application of mineral fertilisers is recommended only on working days.			
5	Fertilisation plans in conformity with the established requirements shall be in place.	Farms which apply manure on more than 150 ha of utilised agricultural land per year as well as farms which use manure produced by 200 or more LSU for fertilisation, or farms where the annual amount of total nitrogen in organic fertilisers used is 20 tonnes or more	The main purpose of fertilisation plans is to stop over-fertilisation. However, so far fertilisation plans are only supposed to specify the amount of organic fertilisers used so the measure will not be effective until mineral fertilisers are included in fertilisation plans.	No decrease
6	The chosen type of fertilisation shall ensure uniform application of fertilisers and a minimum impact of the fertilisation on the environment. When applied on the soil surface, solid and semi-liquid manure shall be incorporated into the soil no later than within 12 hours from its application.	All livestock farms	Application of manure has no or even a negative effect on nitrogen loads because during incorporation of manure NH_4-N does not evaporate and enters the soil. The impact of incorporation on loads of P_{total} has been included in the impact of construction of manure storages.	No change in nitrogen loads is expected, the impact on loads of P_{total} is about 5% and it has been included in the impact of the construction of manure storages.
7	Organic fertilisers shall not be used in riparian protection zones of surface water bodies as well as closer than 2 meters from the upper edges of the slopes of reclamation ditches.	All livestock farms	Fertilisation in riparian protection zones of surface water bodies is not expedient due to low density of LSU so most likely it is not widely spread.	No decrease
8	50% of the area shall be sowed with wintering (winter or perennial) plants.	Farms with more than 15 ha of arable land	This requirement has already been met. According to declarations, wintering crops, meadows and pastures in 2004 accounted for 63.1% of the total declared area, in 2005 this number was 60.6%, in 2006 – 58.2% and in 2007– 60.2%.	No decrease
9	Livestock density on a farm shall not exceed 1.7 of livestock units per hectare of utilised agricultural land.	All livestock farms	At present livestock density does not exceed 1.7 LSU/ha	No decrease
10	Application of crop rotation to prevent erosion.	Farms situated in hilly terrains	Reduction of input of nitrogen, phosphorus and suspended matter into water bodies	Likely decrease in pollution with suspended matter and phosphorus

Source: experts' estimations

The number of LSU on farms of different size and on farms which already have manure storages is provided in Table 7. The table also gives a forecasted number of LSU on farms where manure storages will be constructed after the introduction of the basic measures under the Nitrates Directive.

Table 7. Number of LSU on farms of different size and forecasted number of LSU on farms where manure storages will be constructed as a result of the implementation of the basic measures under the Nitrates Directive

Basin	Number of LSU	No. of LSU on farms with less than 10 LSU	No. of LSU on farms with more than 10 LSU	No. of LSU on farms with manure storages	No. of LSU on farms where manure storages will be constructed
Lielupė	27 312	11 391.5	15 920.5	10 034.8	5 885.7
Mūša	76 263.5	33 983.2	42 280.3	21 681.5	20 598.8
Nemunėlis	19 624.3	10 644.2	8 980.1	2 374.2	6 605.9

Source: Agri-Information and Rural Business Centre

Today about 28% of all LSU in the Lielupė RBD is held on farms with manure storages. It is forecasted that this figure will reach about 54.5% after the implementation of the basic measures under the Nitrates Directive. Taking into account the scope and effectiveness of the measures, animal pollution loads in the Lielupė RBD after the introduction of the basic measures are expected to go down by 5-8%. Pollution reduction in the Lielupė Small Tributaries Sub-basin is likely to be 4-6%, in Mūša Sub-basin – 5-8%, in Nemunėlis Sub-basin – 7-10%.

Implementation costs of the Nitrates Directive

12. 914 manure storages for 170 500 livestock units (LSU) were built from 2004 through 2008. The annual capacity of these storages is 540 thousand tonnes of manure/slurry. The average size of farms which used the assistance under the Nitrates Directive during the said period was 82 LSU. The actual average number of LSU on farms which implemented the requirements of the Nitrates Directive was twice higher than planned because the implementation of these requirements during the assistance period was highly relevant for large farms with more than 300 LSU. Since the main users of the assistance were large farms, the number of manure/slurry tanks built was three times lower than actually planned; however, the capacity of these tanks was much larger.

The basic measures under the Nitrates Directive will cover farms with more than 10 LSU which to date do not have manure storages. The total number of LSU in the Lielupė RBD and the number of LSU on farms of different size and on farms which already have manure storages are given in Table 8. The information on the distribution of LSU on farms of different size and on those with manure storages at the level of wards was provided by the Agri-Information and Rural Business Centre. The LSU number in the basin data was estimated in proportion to area of a respective ward in the basin.

Table 8. LSU number on farms of different size in the Lielupė RBD, 2008

RBD	LSU number	LSU density	LSU number on farms with less than 10 LSU	LSU number on farms with 10 to 300 LSU	LSU number on farms with more than 300	No. of LSU on farms with manure storages in place	No. of LSU on farms where manure storages will be constructed
Lielupė Small Tributaries	27 312.0	0.16	11 391.5	3 756.5	12 164.0	10 034.8	5 885.7
Mūša	76 263.5	0.14	33 983.2	19 675.5	22 604.8	21 681.5	20 598.8
Nemunėlis	19 624.3	0.1	10 644.2	8 289.3	690.8	2 374.2	6 605.9
TOTAL:	123 199.8	0.14	56 018.9	3 1721.3	35 459.6	34 090.5	33 090.4

Source: Agri-Information and Rural Business Centre

To date, the implementation of the requirements for manure management was funded under two programmes: under the Measure "Compliance with standards" of the Rural Development Programme for 2004-2006 and under the first activity area "Implementation of the requirements of the Nitrates Directive and new mandatory Community standards" of the Measure "Modernisation of agricultural holdings" of the Rural Development Programme for 2007-2013 approved by Commission Decision No. C (2007)5076 of 19 October 2007.

Under the Measure "Compliance with standards" of the Rural Development Programme for 2004-2006[1], substantial assistance was provided for the introduction of advanced manure management technologies, acquisition of new manure loading and transportation vehicles, slurry spreading equipment, and reconstruction of the existing or construction of new manure storages or slurry collectors. Economic entities which participate in this programme (about 2 468) are supposed to achieve compliance of their farms with the environmental requirements of the Nitrates Directive within three years from the signing of the agreement. Pursuant to the Measure "Compliance with standards" of the Rural Development Programme for 2004-2006, the total amount allocated from the budget of 2004-2006 in Lithuania was LTL 368 021 000. Also, LTL 57 582 384 were paid out by July 2010 from the 2007-2013 Programme budget under the Measure "Compliance with Standards. Obligations of the Rural Development Programme" of the Rural Development Programme for 2004-2006. In addition, LTL 24 686 045 were paid out (the value of the authorised agreements totals to LTL 38 937 853) until July from the 2007-2013 Programme budget for the "Implementation of the requirements of the Nitrates Directive and new mandatory Community standards" (source: National Paying Agency, NPA, 2010).

The amount allocated for one LSU under the Programme for 2004-2006 varied between LTL 805 and LTL 960 and that under the Programme for 2007-2013 – between LTL 345 and LTL 1 934 (however, the beneficiaries may use these funds to cover not more than 40-60% of the eligible project expenditure). Although the number of manure storages built is available, there is no data on which particular programme the construction was funded from. The final report on the assessment of the Programme for 2004-2006 stated that the implementation of the Nitrates Directive had been allocated 2.5 times more funds than for the implementation of the Milk Directive. Following this

[1] Covers two directives: Council Directive 92/46/EEC of 16 June 1992 laying down the health rules for the production and placing on the market of raw milk, heat-treated milk and milk-based (OJ L 268, 1992 9 14, p. 1-32, Chapter 3, Volume 13, p. 103-134) (Milk Directive) and the Nitrates Directive.

proportion, it is assumed that about LTL 280 million could have been allocated from the EU and national budget funds for the implementation of the Nitrates Directive by 2010.

Since the number of LSU for the manure whereof storages should still be built is more than twice larger than the number of those whose manure is already managed in an appropriate manner and since also smaller manure storages will be required, the additional amount needed in Lithuania totals to about LTL 600 million.

The distribution of the funds in different basins was calculated by dividing the total amount allocated for Lithuania in proportion to the number of manure storages in the basins. It is assumed that the share of manure storages built using the assistance funds is more or less the same in all basins. The estimated distribution of funds is provided in Table 9.

Table 9. Demand of costs for the implementation of the Nitrates Directive in the Lielupė RBD, LTL, rounded up

Sub-basin	Funds paid out for the implementation of the Nitrates Directive	Demand of additional funds for the implementation of the Nitrates Directive
Mūša	45 670 000	43 380 000
Nemunėlis	5 001 000	13 912 400
Lielupė Small Tributaries	21 137 300	12 387 900
Total:	**71 808 300**	**69 679 900**

Source: experts' estimations based on the data of the National Paying Agency

The level of the implementation of the requirement to construct manure storages differs depending on the individual RBD. The amount already paid out in the Lielupė RBD for the implementation of the Directive totals to LTL 72 million and the additional demand may be around LTL 70 million.

Drinking Water Directive

13. The Drinking Water Directive is intended to protect people from negative effects of water pollution ensuring that drinking water is wholesome and clean. The provisions of the Directive are applicable to all kinds of drinking water as well as water used for food preparation and processing. The Drinking Water Directive is not applicable for natural mineral waters and waters which are medicinal products. When the minimum requirements of the Directive are applied, water is wholesome and clean if it is free from any micro-organisms and parasites and from any substances which, in numbers or concentrations, constitute a potential danger to human health.

The key legislation transposing the requirements of the Drinking Water Directive:

13.1. Law of the Republic of Lithuania on Drinking Water (Žin., 2001, No. 64-2327);

13.2. Law of the Republic of Lithuania on Drinking Water Supply and Wastewater Management;

13.3. Wastewater Management Regulation;

13.4. Rules for the Development of Plans for Expansion of Water Supply and Wastewater Management Infrastructure approved by Order No. D1-636 of the Minister of Environment of the Republic of Lithuania of 29 December 2006 (Žin., 2007, No. 8-337);

13.5. Procedure for State Control of Drinking Water approved by Order No. 643 of the Director of the State Food and Veterinary Service of the Republic of Lithuania of 10 December 2002 ((Žin., 2003, No. 3-99), which transposed the specific requirements of the Directive for drinking water quality control;

13.6. Lithuanian Hygiene Norm HN 24:2003 "Drinking water safety and quality requirements" approved by Order No. V-455 of the Minister of Health of the Republic of Lithuania of 23 July 2003 (Žin., 2003, No. 79-3606);

13.7. Lithuanian Hygiene Norm HN 44:2006 "Delineation and maintenance of sanitary protection zones of wellfields" approved by Order No. V-613 of the Minister of Health of the Republic of Lithuania (Žin., 2006, No. 81-3217);

13.8. Law of the Republic of Lithuania on Local Self-Government (Žin., 1994, No. 55-1049; 2008, No. 113-4290), which contains a provision on the obligation of municipalities to organise supply of drinking water.

Effect of the measures under the Drinking Water Directive

14. Controls over drinking water quality

This measure is implemented in accordance with the requirements of the Lithuanian Hygiene Norm HN 24:2003 "Drinking water safety and quality requirements". The Hygiene Norm sets forth the requirements for the quality of drinking water (chemical composition, the number of quality assessments per year, analysis methods, etc.). The quality of drinking water in Lithuania is controlled by the Ministry of Health and the State Food and Veterinary Service.

15. Removal of old operational bore wells which are no longer in use

The procedure for the removal of old operational bore wells which are no longer used and which can turn into potential groundwater pollution sources is laid down in the Lithuanian environmental regulatory document LAND 4-99 "Procedure for the design, installation, temporary shutdown and removal of wells intended for water supply and use of water for heating energy" approved by Order No. 417 of the Minister of Environment of the Republic of Lithuania of 23 December 1999 (Žin., 1999, No. 112-3263). The procedure for the removal of bore wells is controlled by the Ministry of Environment of the Republic of Lithuania.

16. Establishment of sanitary protection zones of wellfields

Sanitary protection zones (SPZ) of wellfields are established and validated in accordance with the requirements of the Hygiene Norm HN 44:2006 "Delineation and maintenance of sanitary protection zones of water extraction sites". Sanitary protection zones are defined for each water extraction site and consist of three belts:

16.1. the belt of strict regime (first belt) is a belt located closest to the catchment equipment and designed for the protection of the wellfield and groundwater catchment equipment against intentional or accidental pollution, where any economic or other activity not related with the extraction, improvement and supply of groundwater is forbidden;

16.2. the belt preventing microbial pollution (second belt) is a protective belt where microbial and chemical pollution is restricted;

16.3. the belt preventing chemical pollution (third belt) is a protective belt where chemical pollution is restricted.

The municipality on the territory of which a respective wellfield is located shall organise establishment and protection of the WPZ in accordance with the requirements of the Law of the Republic of Lithuania on Drinking Water and the Law of the Republic of Lithuania on Protected Areas (Žin., 1993, No. 63-1188; 2001, No. 108-3902).

A special plan of the SPZ of a wellfield drafted, agreed and approved pursuant to the procedure laid down in relevant legislation has to be registered with the Register of Documents of Planning of Municipal Territories and with the Register of the Earth Entrails. The approved belts of the SPZ of wellfields have to be marked when drafting other territorial planning documents, and economic activities are regulated in accordance with the limitations laid down in the Hygiene Norms HN 44:2006 and other legislation. An important measure is controls over establishment and official designation of SPZ because so far, as provided for in HN 44:2006 "Delineation and maintenance of sanitary protection zones of water extraction sites", no sanitary protection zones have been officially designated in the Lielupė RBD.

Only groundwater is used for drinking purposes in Lithuania and the quality of groundwater is good due to favourable natural conditions and environmental measures applied.

Implementation costs of the Drinking Water Directive

17. The Drinking Water Supply and Wastewater Management Strategy for 2008-2015 has set forth that drinking water supply and wastewater management services shall become accessible to at least 95% of the Lithuanian population by 2015 and that publicly supplied water shall fully (100%) comply with the established safety and quality requirements.

18. Measures for the implementation of the requirements of the Drinking Water Directive (construction of new and reconstruction of the existing water supply networks, construction and rehabilitation of water improvement facilities) for 2007-2013 cover measures provided for on the List of National Projects No. 1 under Measure No. VP3-3.1-AM-01-V "Renovation and development of water supply and wastewater management systems". The measures for the implementation of the requirements under the Drinking Water Directive are planned to be introduced together with the measures for the implementation of the Urban Wastewater Treatment Directive and other ones designed for the improvement of wastewater infrastructure (projects cover both water supply and wastewater management systems).

18.1. The planned measures for the Mūša Sub-basin cover construction of 57 km of new and reconstruction of 6.1 km of the existing water supply networks as well as construction of water improvement facilities.

18.2. The planned measures for the Nemunėlis Sub-basin cover construction of 9 km of new water supply networks.

18.3. The planned measures for the Lielupė Small Tributaries Sub-basin cover construction of 19 km of new water supply networks

The total investment costs of the measures for the improvement of the water supply infrastructure and the wastewater management infrastructure in the Lielupė RBD amount to LTL 229.61 million.

Birds Directive

19. The Birds Directive regulates the protection of areas of importance for birds and requires establishment of special protected areas for the conservation of certain species of birds. The Checklist of the Birds of Lithuania at present contains 358 species of birds. 10 areas of importance for the conservation of birds were situated in the Lielupė RBD in 2009.

The key legislation transposing the Birds Directive:

19.1. Law of the Republic of Lithuania on Protected Areas;

19.2. Law of the Republic of Lithuania on Protected Fauna, Flora and Fungi Species and Communities (Žin., 1997, Nr. 108-2727; 2009, Nr. 159-7200);

19.3. General Regulations of Areas of Importance for the Conservation of Habitats or Birds approved by Resolution No. 276 of the Government of the Republic of Lithuania of 15 March 2004 (Žin., 2004, No. 41-1335);

19.4. Criteria for the Screening of Areas of Importance for the Conservation of Birds approved by Order No. D1-358 of the Minister of Environment of the Republic of Lithuania of 2 July 2008 (Žin., 2008, No. 77-3048), which regulate the screening of areas important for the conservation of birds.

For the purpose of conservation, restoration and maintenance of such areas, certain measures have to be implemented. Very often such measures include restriction of economic activities in protected areas, or special measures designed to recreate and restore such areas. These measures are listed below.

Establishment of areas of importance for the conservation of birds

20. The General Regulations of Areas of Importance for the Conservation of Habitats or Birds approved by Resolution No. 276 of the Government of the Republic of Lithuania of 15 March 2004 (Žin., 2004, No. 41-1335) laid down that areas of importance for the conservation of birds shall be established with a view to preserve protected species of birds in their habitats. In addition, areas important for bird migration must also be preserved.

The establishment of protected areas in Lithuania falls within the responsibility of the State Service for Protected Areas. Areas of importance for the conservation of birds are included in the List of Protected Areas of the Republic of Lithuania, or Parts thereof, Containing Areas of Importance for the Conservation of Birds approved by Resolution No. 399 of the Government of the Republic of Lithuania of 8 April 2004 (Žin., 2004, No. 55-1899; 2006, No. 92-3635, 2010, 36-1719). The number of the approved areas of importance for the conservation of birds totals to 82.

Development of nature management plans for areas of importance for the conservation of birds

21. The General Regulations of Areas of Importance for the Conservation of Habitats or Birds require preventing deterioration in the status of conservation of natural habitats and protected species. This requires development of nature management plans (NMP) for protected areas and strategic planning documents. NMP are approved by orders of the Minister of Environment designating institutions to be in charge and potential sources of financing.

Status of the implementation of the Birds Directive

22. The General Regulations of Areas of Importance for the Conservation of Birds and boundaries of the areas were approved by relevant resolutions of the Government of the Republic of Lithuania. NMP are prepared for specific areas and usually cover both areas of importance for the conservation of birds (AICB) and areas of importance for the conservation of natural habitats (AICH). Nature management plans for 54 areas were developed and approved by relevant orders of the Minister of Environment of the Republic of Lithuania until July 2010 (throughout Lithuania). Most of them have been prepared for 10 years' period (2008-2017).

Mūša Sub-basin

23. There are five areas of importance for the conservation of birds (AICB) in the Mūša RBD occupying a territory of 4 910 ha. A considerable area thereof, 14 983 ha (34%), coincides with the territory of areas of importance for the conservation of natural habitats (Table 10).

Table 10. Areas of importance for the conservation of birds in the Mūša Sub-basin

	Area of importance for the conservation of birds	AICB code	Municipality	Total area of AICB, ha	Area of AICB in the sub-basin, ha	Share of AICB in the sub-basin, %	Area of AICB overlapping with AICH, ha
1	Gedžiūnų forest	LTPAKB002	Pakruojis distr. and Joniškis distr.	14 269	14 269	100	3
2	Gubernijos forest	LTSIAB001	Šiauliai distr. and Joniškis distr.	19 262	14 582	76	
3	Mūšos tyrelis marsh	LTJONB001	Joniškis distr.	1 700	633	37	608
4	Šimonių forest	LTANYB001	Anykščiai distr. and Kupiškis distr.	23 267	251	1	251
5	Žalioji giria forest	LTPANB001	Panevėžys distr. and Kupiškis distr.	14 174	14 174	100	14 120
	TOTAL			**72 673**	**43 910**	**60**	**14 983**

Note: The area of AICB and AICH were established using geographical information systems (GIS)
Source: State Service for Protected Areas and experts' estimations

Information about NMP for areas situated in the Mūša Sub-basin is provided in Table 11.

Table 11. Protected areas with nature management plans (NMP) in place in the Mūša Sub-basin

NMP	Status	Area of the site with NMP in place, ha	Area of the site covered by NMP in the sub-basin, ha	Share of the site covered by NMP in the sub-basin, %	Area of the site covered by NMP in the sub-basin where AICB is situated, ha
Žalioji giria forest	Approved	14 173	14 173	100.0	14 173
TOTAL		**14 173**	**14 173**	**100.0**	**14 173**

Note: Titles of the nature management plans usually do not coincide with the names of the corresponding AICB or AICH.
Source: State Service for Protected Areas and experts' estimations

Lielupė Small Tributaries Sub-basin

24. There is one area of importance for the conservation of birds in the Lielupė Small Tributaries Sub-basin occupying a territory of 1 056 ha. The entire area coincides with the territory of the area of importance for the conservation of natural habitats (Table 12).

Table 12. Areas of importance for the conservation of birds in the Lielupė Small Tributaries Sub-basin

	Area of importance for the conservation of birds	AICB code	Municipality	Total area of AICB, ha	Area of AICB in the sub-basin, ha	Share of AICB in the sub-basin, %	Area of AICB overlapping with AICH, ha
1	Mūšos tyrelis marsh	LTJONB001	Joniškis distr.	1 463	1 056	72	1 053
	TOTAL			1 463	1 056	72	1 053

Note: The area of AICB and AICH were established using geographical information systems (GIS)
Source: State Service for Protected Areas and experts' estimations

No NMP have been prepared for AICB situated in the Lielupė Small Tributaries Sub-basin.

Nemunėlis Sub-basin

25. There are four areas of importance for the conservation of birds in the Nemunėlis RBD occupying a territory of 20 993 ha. The major area thereof, 17 816 ha (85%), coincides with the territory of areas of importance for the conservation of natural habitats (Table 13).

Table 13. Areas of importance for the conservation of birds in the Nemunėlis Sub-basin

	Area of importance for the conservation of birds	AICB code	Municipality	Total area of AICB, ha	Area of AICB in the sub-basin, ha	Share of AICB in the sub-basin, %	Area of AICB overlapping with AICH, ha
1	Biržų forest	LTBIRB001	Biržai distr.	17 684	17 683	100	17 683
2	Lake Čedasas and its lake sides	LTROKB001	Rokiškis distr.	132	132	100	
3	Nemunėlis River valley	LTBIRB002	Biržai distr., Rokiškis distr.	1 550	1 549	100	
4	Valleys of rivers Šaltoja and Vyžuona	LTROKB004	Rokiškis distr.	1 569	1 569	100	132
	TOTAL			**20 935**	**20 933**	**100**	**17 816**

Note: The area of AICB and AICH were established using geographical information systems (GIS)
Source: State Service for Protected Areas and experts' estimations

Information about NMP for areas situated in the Nemunėlis Sub-basin is provided in Table 14.

Table 14. Protected areas with nature management plans (NMP) in place in the Nemunėlis Sub-basin

NMP	Status	Area of the site with NMP in place, ha	Area of the site covered by NMP in the sub-basin, ha	Share of the site covered by NMP in the sub-basin, %	Area of the site covered by NMP in the sub-basin where AICB is situated, ha
Biržų forest	Under development (not published)	17 683	17 683	100.0	17 683
Lake Čedasas and its lake sides	Approved	132	132	100.0	132
Nemunėlis River valley	Approved	2 195	2 188	99.7	1 548
TOTAL		**20 010**	**20 003**		**19 363**

Note: Titles of the nature management plans usually do not coincide with the names of the corresponding AICB or AICH.
Source: State Service for Protected Areas and experts' estimations

Implementation costs of the Birds Directive

26. The costs of the implementation of the Birds Directive include the costs needed for the development and implementation of nature management plans for areas of importance for the conservation of birds, and for the monitoring of AICB. These costs are planned to be funded from the state budget. The costs of the measures provided in the nature management plans should be deemed as indicative ones. The costs of the implementation of individual measures will be revised by announcing tenders[2].

The costs of the implementation of the Birds Directive in the Lielupė RBD were estimated observing the following assumptions:

26.1. The average costs of the development of a nature management plan were estimated on the basis of a survey of suppliers' prices for elaboration of 40 nature management plans (with the total area of 37 146 ha), which was conducted by the State Service for Protected Areas. The bids for the development of these plans varied from LTL 1.352 million to LTL 1.965 million (on average LTL 1.66 million or LTL 45 per ha). For the calculation purposes, it was assumed that the costs of the development of a NMP on the territory of one hectare are the same. In NATURA 2000 areas where AICB and AICH overlap, 50% of the costs were assigned to the costs of the implementation of the Habitats Directive. It is assumed that NMP for all AICB will be prepared in five years.

26.2. The investment and operating costs of the implementation of the nature management plans were estimated on the basis of information contained in the NMP provided on the website of the Ministry of Environment of the Republic of Lithuania[3]. The implementation costs were recalculated for the period of the implementation of the Management Plan of the RBD (i.e. until 2015).

26.3. The costs of the implementation of the Birds Directive for the areas with no nature management plans[4] were calculated following the methodology of unit costs. The average annual investment costs of the implementation of NMP in areas of importance for the conservation of birds (during the period 2007-2015) total to LTL 54 per ha and

[2] Data of the State Service for Protected Areas
[3] Information source: http://www.am.lt/gamtotvarka/plans.php
[4] Information source: http://www.am.lt/gamtotvarka/plans.php

the average annual operating costs are 7.89 LTL/ha. On sites where AICB and AICH overlap, the average investment costs (for the period 2007-2015) total to LTL 20 per ha, and the average annual operating costs are LTL 3.12 per ha. These unit costs were calculated on the basis of the implementation costs of the NMP already developed and those to be elaborated in future[5], taking into account the overlapping of AICB and AICH[6].

26.4. AICB monitoring costs include expenditures for salaries, social insurance contributions and fuel costs[7]. The recalculation of the monitoring costs for sub-basins assumed that monitoring costs for one hectare are the same in different areas important for the conservation of birds. The costs of salaries were estimated following the gross salary per average month in the public sector during the first quarter of 2009[8].

27. The average investment costs of the implementation of the Birds Directive in the Mūša Sub-basin total to around LTL 1 584 654 and the average annual operating costs are about LTL 599 594 (information provided in Table 15).

Table 15. Implementation costs of the Birds Directive in the Mūša Sub-basin

Group of costs	Measure period	Preliminary investment costs (2007-2015), LTL	Operating costs (2007-2015), LTL	Average annual operating costs, LTL
Development of NMP	10 years	0	1 318 722	263 744
Implementation of NMP already in place	10 years	24 092	36 565	4 063
Implementation of new NMP	10 years	1 560 562	1 150 562	230 100
AICB monitoring	1 year	0	0	101 687
TOTAL		**1 584 654**	**2 505 849**	**599 594**

Source: State Service for Protected Areas and experts' estimations

The average investment costs of the implementation of the Birds Directive in the Nemunėlis Sub-basin total to around LTL 345 660 and the average annual operating costs are about LTL 114 723 (information provided in Table 16).

Table 16. Implementation costs of the Birds Directive in the Nemunėlis Sub-basin

Group of costs	Measure period	Preliminary investment costs (2007-2015), LTL	Operating costs (2007-2015), LTL	Average annual operating costs, LTL
Development of NMP	10 years	0	67 704	13 541
Implementation of NMP already in place	10 years	10 000	11 500	1 278
Implementation of new NMP	10 years	335 660	257 128	51 426
AICB monitoring	1 year	0	0	48 478
TOTAL		**345 660**	**336 332**	**114 723**

Source: State Service for Protected Areas and experts' estimations

[5] Information source: http://www.am.lt/gamtotvarka/plans.php

[6] Information source: GIS information of the cadastre of the Areas Protected by the State.

[7] The average costs of AICB monitoring were estimated having surveyed the Administrations of Labanoras Regional Park, Aukštaitija National Park, Žuvintas Regional Park, Regional Parks of the Nemunas Loops, Regional park of Kaunas Lagoon, Anykščiai Regional Park, and Varniai Regional Park about work and fuel costs for the monitoring of AICB in 2007-2009. Due to variation of the monitoring scopes, the average data of 2007-2009 was used.

[8] According to Statistics Lithuania, the average monthly gross salary in the public sector during the first quarter of 2009 was LTL 2 318.8.

The average investment costs of the implementation of the Birds Directive in the Lielupė Small Tributaries Sub-basin total to around LTL 10 540 and the average annual operating costs are about LTL 8 890 (information provided in Table 17).

Table 17. Implementation costs of the Birds Directive in the Lielupė Small Tributaries Sub-basin

Group of costs	Measure period	Preliminary investment costs (2007-2015), LTL	Operating costs (2007-2015), LTL	Average annual operating costs, LTL
Development of NMP	10 years	0	23 850	4 770
Implementation of NMP already in place	10 years	0	0	0
Implementation of new NMP	10 years	10 542	8 346	1 669
AICB monitoring	1 year	0		2 447
TOTAL		**10 542**	**32 196**	**8 886**

Source: State Service for Protected Areas and experts' estimations

According to the State Service for Protected Areas, 90 more areas for the conservation of birds are planned to be established in Lithuania with a view to implement the requirements of the Birds Directive. A number of these areas should be established in the Lielupė RBD so the annual implementation costs of the Birds Directive in the sub-basins might go up.

Habitats Directive

28. The Habitats Directive regulates protection of areas of importance for natural habitats and requires establishment of special protected areas for the conservation of certain natural habitats.

The key legislation transposing the Habitats Directive:

28.1. Law of the Republic of Lithuania on Protected Areas;

28.2. Law of the Republic of Lithuania on Protected Fauna, Flora and Fungi Species and Communities (Žin., 1997, Nr. 108-2727; 2009, Nr. 159-7200);

28.3. General Regulations of Areas of Importance for the Conservation of Habitats or Birds;

28.4. Boundaries of areas of importance for the conservation of habitats were approved with the List of Areas in Conformity with the Criteria for the Screening of Areas of Importance for the Conservation of Natural Habitats Intended for the Provision to the European Commission, which was adopted by Order No. D1-210 of the Minister of Environment of the Republic of Lithuania of 22 April 2009 (Žin., 2009, No. 51-2039);

28.5. List of Protected Areas of the Republic of Lithuania, or Parts thereof, Containing Areas of Importance for the Conservation of Birds; Areas of Importance for the Conservation of Birds approved by Resolution No. 399 of the Government of the Republic of Lithuania of 8 April 2004 (Žin., 2004, No. 55-1899; 2006, No. 92-3635, 2010, 36-1719).

For the purpose of conservation, restoration and maintenance of natural habitats, certain measures have to be implemented. Very often such measures include restriction of economic activities in protected areas, or special measures designed to recreate and restore such areas.

Establishment of areas of importance for the conservation of habitats

29. The General Regulations of Areas of Importance for the Conservation of Habitats or Birds laid down that areas of importance for the conservation of habitats shall be established with a view to preserve and restore natural habitats of flora and fauna.

Development of nature management plans for habitats

30. The General Regulations of Areas of Importance for the Conservation of Habitats or Birds require preventing deterioration in the status of conservation of natural habitats and protected species. This requires development of nature management plans for protected areas or other strategic planning documents providing for specific nature management measures.

Other measures

31. Apart from the establishment of special areas for the protection and conservation of birds and habitats, a number of other relevant measures have been introduced. These include implementation of special protection and conservation projects (e.g. building of nests, or training courses on getting to know and observe birds), application of subsidies for farmers who undertake to protect birds with the help of certain measures, as well as conducting of trainings and research projects, and publishing activities. Every year the Minister of Environment of the Republic of Lithuania approves a monitoring plan – a list of birds to be monitored and monitoring sites.

The Rural Development Programme for 2007-2013 provide for measures promoting environmentally-friendly farming. A methodology for the inventory of habitats is currently prepared and will be used for habitat monitoring starting in 2015 (project "Preparation for the inventory check of natural habitats of Community importance: development of methodological base"; implementer – Botanical Institute).

Assistance in the field of protected areas is related to the intervention area "Improvement and maintenance of the ecological balance of protected forested areas". 35% of the total assistance under Measures 1.3 (LTL 50.2 million) was actually allocated for this field in Lithuania as compared to the average of 1% of the EU structural assistance for the environment in other countries.

Network of NATURA 2000 sites

32. NATURA 2000 is a network of protected areas on the territory of the European Union, which covers natural habitats and species that are very important for the biological diversity of Europe. The network is developed by implementing the requirements of the Birds Directive and the Habitats Directive. Both directives require establishment of special protected areas for the conservation of certain biological species or important habitats.

Lithuania has been developing the network of NATURA 2000 sites incorporating it into the existing national system of protected areas. To date, the status of NATURA 2000 sites has been mainly granted to the existing protected areas (strict reserves, reserves, national and regional parks) or parts thereof.

Until 2009, there were 9 areas of importance for the conservation of birds and 19 areas of importance for the conservation of habitats within the Lielupė RBD.

Status of the implementation of the Habitats Directive

33. The Regulations of Areas of Importance for the Conservation of Natural Habitats were adopted by a resolution of the Government of the Republic of Lithuania and the boundaries of the areas of importance for the conservation of natural habitats were approved by an order of the Minister of Environment of the Republic of Lithuania. With a view to prevent decrease in the status of the conservation of protected species, nature management plans and other strategic documents have to be developed for protected areas. Nature management plans are approved by an order of the Minister of the Environment designating institutions to be in charge, measures and costs of implementation and potential funding sources. Nature management plans are elaborated for specific areas and usually cover both AICB and AICH. Until July 2010, nature management plans were developed for 55 areas and approved by respective orders of the Minister of the Environment. The majority of the plans are designed for a 10 years' period (2008-2017).

Mūša Sub-basin

34. There are 19 areas of importance for the conservation of natural habitats in the Mūša Sub-basin occupying the territory of 38 127 ha. A relatively large area thereof, 14 983 ha (39%), coincides with the territory of the areas of importance for the conservation of birds (Table 18).

Table 18. Areas of importance for the conservation of natural habitats in the Mūša Sub-basin

	Area of importance for the conservation of natural habitats	Municipality	AICH code	Total area of AICH, ha	Area of AICH in the RBD, ha	Share of AICH in the RBD, %	Area of AICH overlapping with AICB, ha
1	Daudžgirių forest	Biržai distr.	LTBIR0002	169	169	100	
2	Grūžių forest	Pasvalys distr.	LTPAS0005	79	79		
3	Surroundings of Karajimiškis village	Biržai distr.	LTBIR0005	28	8	30	
4	Kepurinės bog	Kupiškis distr.	LTKUP0001	700	435	62	
5	Kruoja River valley	Pakruojis distr.	LTPAK0001	195	195	100	3
6	Kurklių forest	Radviliškis distr.	LTRAD0005	224	64	29	
7	Lepšynės forest	Pasvalys distr.	LTPAS0001	207	207	100	
8	Lėvuo River valley	Kupiškis distr.	LTKUP0005	862	862	100	
9	Mūša River valley below Raudonpamūšis	Pasvalys distr., Pakruojis distr.	LTPAS0003	77	77	100	
10	Mūšos tyrelio forest	Joniškis distr.	LTJOI0001	1 676	608	36	608
11	Notigalės bog	Kupiškis distr., Rokiškis distr.	LTKUP0003	1 391	473	34	
12	Pamūšiai	Pasvalys distr.	LTPAS0002	478	478	100	
13	Pyvesa River valley below Rinkūnai	Pasvalys distr.	LTPAS0004	114	114	100	

	Area of importance for the conservation of natural habitats	Municipality	AICH code	Total area of AICH, ha	Area of AICH in the RBD, ha	Share of AICH in the RBD, %	Area of AICH overlapping with AICB, ha
14	Radvilonių forest	Radviliškis distr.	LTRAD0004	158	158	100	
15	Rėkyvos bog	Šiauliai city, Šiauliai distr.	LTSIA0005	2 560	2 150	84	
16	Sakonių bala mire	Kupiškis distr.	LTKUP0002	61	60	98	
17	Skapagirio forest	Kupiškis distr.	LTKUP0004	2 161	1 767	82	
18	Šimonių forest	Anykščiai distr., Kupiškis distr.	LTANY0013	23 263	251	1	251
19	Žalioji giria forest	Biržai distr., Kupiškis distr., Panevėžys distr., Pasvalys distr.	LTPAN0006	33 870	29 971	88	14 120
	Total:			**68 271**	**38 127**	**56**	**14 983**

Note: The area of AICB and AICH were established using GIS.
Source: State Service for Protected Areas and experts' estimations

Information about NMP for areas situated in the Mūša Sub-basin is provided in Table 19.

Table 19. Protected areas with nature management plans (NMP) in place in the Mūša Sub-basin

NMP	Status	Area of the site with NMP in place, ha	Area of the site covered by NMP in the sub-basin, ha	Share of the site covered by NMP in the sub-basin, %	Area of the site covered by NMP in the sub-basin where AICB is situated, ha
Kepurinės bog	Approved	700	435	62.2	435
Notigalės bog	Approved	1 391	473	34.0	473
Žalioji giria forest	Approved	14 173	14 173	100.0	14 119
TOTAL		**16 264**	**15 081**		**15 027**

Note: Titles of the nature management plans usually do not coincide with the names of the corresponding AICB or AICH.
Source: State Service for Protected Areas and experts' estimations

Nemunėlis Sub-basin

35. There are 13 areas of importance for the conservation of natural habitats in the Nemunėlis Sub-basin occupying the territory of 23 053 ha. A large area thereof, 17 683 ha (82%), coincides with the territory of the areas of importance for the conservation of birds (Table 20).

Table 20. Areas of importance for the conservation of natural habitats in the Nemunėlis Sub-basin

	Area of importance for the conservation of natural habitats	Municipality	AICH code	Total area of AICH, ha	Area of AICH in the RBD, ha	Share of AICH in the RBD, %	Area of AICH overlapping with AICB, ha
1	Ąžuolynės forest	Biržai distr.	LTBIR0008	92	92	100	
2	Biržų forest	Biržai distr.	LTBIR0006	17 684	17 683	100	17 683
3	Surroundings of Drąseikiai village	Biržai distr.	LTBIR0007	34	34	100	
4	Gaidžiabalės samanynė raised bog	Rokiškis distr.	LTROK0003	172	172	100	
5	Gypsum karst lakes and their lake sides	Biržai distr.	LTBIR0004	1 240	1 240	100	
6	Surroundings of Karajimiškis village	Biržai distr.	LTBIR0005	28	19	70	
7	Konstantinavos bog	Rokiškis distr.	LTROK0004	82	82	100	
8	Valleys of rivers Nemunėlis and Apaščia	Biržai distr.	LTBIR0003	296	292	98	
9	Notigalės bog	Kupiškis distr., Rokiškis distr.	LTKUP0003	1 391	797	57	
10	Padaičių forest	Biržai distr.	LTBIR0009	61	61	100	
11	Skapagirio forest	Kupiškis distr.	LTKUP0004	2 161	4	0	
12	Suvainiškio forest	Rokiškis distr.	LTROK0015	1 193	1 193	100	
13	Šaltoja River valley	Rokiškis distr.	LTROK0009	133	133	100	132
	Total:			**24 567**	**21 802**	**89**	**17 816**

Note: The area of AICB and AICH were established using GIS.
Source: State Service for Protected Areas and experts' estimations

Information about NMP for areas situated in the Nemunėlis Sub-basin is provided in Table 21.

Table 21. Protected areas with nature management plans (NMP) in place in the Nemunėlis Sub-basin

NMP	Status	Area of the site with NMP in place, ha	Area of the site covered by NMP in the RBD, ha	Share of the site covered by NMP in the RBD, %	Area of the site covered by NMP in the RBD where AICH is situated, ha
Biržų forest	Under development (not published)	17 683	17 683	100,0	17 683
Notigalės bog	Approved	1 391	797	57,3	797
TOTAL		**19 074**	**18 480**		**18 480**

Note: Titles of the nature management plans usually do not coincide with the names of the corresponding AICB or AICH.
Source: State Service for Protected Areas and experts' estimations

Lielupė Small Tributaries Sub-basin

36. There are 8 areas of importance for the conservation of natural habitats in the Lielupė Small Tributaries Sub-basin occupying the territory of 3 924 ha. A relatively large area thereof, 1 053 ha (32%), coincides with the territory of the areas of importance for the conservation of birds (Table 22).

Table 22. Areas of importance for the conservation of natural habitats in the Lielupė Small Tributaries Sub-basin

	Area of importance for the conservation of natural habitats	Municipality	AICH code	Total area of AICH, ha	Area of AICH in the RBD, ha	Share of AICH in the RBD, %	Area of AICH overlapping with AICB, ha
1	Laumenio forest	Pakruojis distr.	LTPAK0004	645	645	100	
2	Forest nearby Dilbinėliai	Joniškis distr.	LTJOI0003	57	57	100	
3	Mūšos tyrelio forest	Joniškis distr.	LTJOI0001	1 676	1 068	64	1 053
4	Pabalių forest and Švėtė River valley	Joniškis distr.	LTJOI0008	61	61	100	
5	Vilkiaušio forest	Joniškis distr.	LTJOI0009	124	124	100	
6	Vilkija River valley	Joniškis distr.	LTJOI0002	64	64	100	
7	Žagarės forest	Joniškis distr.	LTJOI0004	1 247	1 247	100	
8	Žagarės asar	Joniškis distr.	LTJOI0007	49	49	100	
	Total:			**3 924**	**3 316**	**85**	**1 053**

Note: The area of AICB and AICH were established using GIS.
Source: State Service for Protected Areas and experts' estimations

No NMP have been prepared for AICH situated in the Lielupė Small Tributaries Sub-basin.

Implementation costs of the Habitats Directive

37. The costs of the implementation of the Habitats Directive include the costs needed for the development and implementation of nature management plans for areas of importance for the conservation of habitats, and for the monitoring of AICH. The costs of the measures provided in the nature management plans should be deemed as indicative ones. The costs of the implementation of individual measures will be revised by announcing tenders[9].

The costs of the implementation of the Habitats Directive in the individual sub-basins of the Lielupė RBD were estimated observing the following assumptions:

37.1. The average costs of the development of a nature management plan were estimated on the basis of a survey of suppliers' prices for elaboration of 40 nature management plans (with the total area of 37 146 ha), which was conducted by the State Service for Protected Areas. The bids for the development of these plans varied from LTL 1.352 million to LTL 1.965 million (on average LTL 1.66 million or LTL 45 per ha). For the calculation purposes, it was assumed that the costs of the development of a NMP on the territory of one hectare are the same. In NATURA 2000 areas where AICB and AICH overlap, 50% of the costs were assigned to the costs of the implementation of

[9] Data of the State Service for Protected Areas

the Habitats Directive. It is assumed that NMP for all AICB will be prepared in five years.

37.2. The investment and operating costs of the implementation of the nature management plans were estimated on the basis of information contained in the NMP provided on the website of the Ministry of Environment of the Republic of Lithuania[10]. The implementation costs were recalculated for the period of the implementation of the Management Plan of the RBD (i.e. until 2015).

37.3. The costs of the implementation of the Habitats Directive for the areas with no nature management plans[11] were calculated following the methodology of unit costs. The average annual investment costs of the implementation of NMP in areas of importance for the conservation of natural habitats (during the period 2007-2015) total to LTL 6.55 per ha and the average annual operating costs are estimated at LTL 15.06 per ha. On sites where AICH and AICB overlap, the average investment costs (for the period 2007-2015) total to LTL 19.66 per ha, and the average annual operating costs are LTL 3.12 per ha. These unit costs were calculated on the basis of the implementation costs of the NMP already developed and those to be elaborated in future[12], taking into account the overlapping of AICB and AICH[13].

37.4. AICH monitoring costs include expenditures for salaries, social insurance contributions and fuel costs[14]. The recalculation of the monitoring costs for sub-basins assumed that monitoring costs for one hectare are the same in different areas important for the conservation of natural habitats. The costs of salaries were estimated following the gross salary per average month in the public sector during the first quarter of 2009[15]. The estimations did not include habitat monitoring costs because such monitoring was not carried out and the required monitoring methodologies were not in place.

Costs of implementation of the Habitats Directive in the Mūša Sub-basin

38. The average investment costs of the implementation of the Habitats Directive in the Mūša Sub-basin total to around LTL 177 950 and the average annual operating costs are estimated at about LTL 641.513 (information provided in Table 23).

Table 23. Implementation costs of the Habitats Directive in the Mūša Sub-basin

Group of costs	Measure period	Preliminary investment costs (2007-2015), LTL	Operating costs (2007-2015), LTL	Average annual operating costs, LTL
Development of NMP	10 years	0	1 020 043	204 009
Implementation of NMP already in place	10 years	23 908	82 443	9 160
Implementation of new NMP	10 years	154 042	1 688 056	337 611
AICH monitoring	1 year	0	0	90 733
TOTAL		**177 950**	**2 790 542**	**641 513**

Source: State Service for Protected Areas and experts' estimations

[10] Information source: http://www.am.lt/gamtotvarka/plans.php
[11] Information source: http://www.am.lt/gamtotvarka/plans.php
[12] Information source: http://www.am.lt/gamtotvarka/plans.php
[13] Information source: GIS information of the cadastre of the Areas Protected by the State.
[14] The average costs of AICB monitoring were estimated having surveyed the Administrations of Labanoras Regional Park, Aukštaitija National Park, Žuvintas Regional Park, Regional Parks of the Nemunas Loops, Regional park of Kaunas Lagoon, Anykščiai Regional Park, and Varniai Regional Park about work and fuel costs for the monitoring of AICB in 2007-2009. Due to variation of the monitoring scopes, the average data of 2007-2009 was used.
[15] According to Statistic Lithuania, the average monthly gross salary in the public sector during the first quarter of 2009 was LTL 2 318.8.

Costs of implementation of the Habitats Directive in the Nemunėlis Sub-basin

39. The average investment costs of the implementation of the Habitats Directive in the Nemunėlis Sub-basin total to around LTL 196 026 and the average annual operating costs are estimated at about LTL 160 363 (information provided in Table 24).

Table 24. Implementation costs of the Habitats Directive in the Nemunėlis Sub-basin

Group of costs	Measure period	Preliminary investment costs (2007-2015), LTL	Operating costs (2007-2015), LTL	Average annual operating costs, LTL
Development of NMP	10 years	0	146 524	29 305
Implementation of NMP already in place	10 years	0	28 521	3 169
Implementation of new NMP	10 years	196 026	380 026	76 005
AICH monitoring	1 year	0	0	51 884
TOTAL		**196 026**	**555 071**	**160 363**

Source: State Service for Protected Areas and experts' estimations

Costs of implementation of the Habitats Directive in the Lielupė Small Tributaries Sub-basin

40. The average investment costs of the implementation of the Habitats Directive in the Lielupė Small Tributaries Sub-basin total to around LTL 25 168 and the average annual operating costs are estimated at about LTL 68.872 (information provided in Table 25).

Table 25. Implementation costs of the Habitats Directive in the Lielupė Small Tributaries Sub-basin

Group of costs	Measure period	Preliminary investment costs (2007-2015), LTL	Operating costs (2007-2015), LTL	Average annual operating costs, LTL
Development of NMP	10 years	0	125 547	25 109
Implementation of NMP already in place	10 years	0	0	0
Implementation of new NMP	10 years	25 168	179 356	35 871
AICH monitoring	1 year	0	0	7 892
TOTAL		**25 168**	**304 903**	**68 872**

Source: State Service for Protected Areas and experts' estimations

According to the State Service for Protected Areas, 300 more areas for the conservation of habitats are planned to be established in Lithuania with a view to implement the requirements of the Habitats Directive. A number of these areas should be established in the Lielupė RBD so the implementation costs of the Habitats Directive in the sub-basins might go up.

Bathing Water Directive

41. The Bathing Water Directive requires that the Member States officially designate bathing sites and take all necessary measures to ensure adequate quality of bathing waters. Though the parameters set in the Bathing Water Directive do not include such water quality indicators as nitrogen (N), phosphorus (P) or BOD, but does regulate parameters which characterise microbiological bathing water quality and can affect bathers' health.

The key piece of national legislation transposing the Bathing Water Directive is the Lithuanian Hygiene Norm HN 92:2007 “Beaches and bathing water quality” approved by Order No. V-1055 of the Minister of Health of the Republic of Lithuania of 21 December 2007 (Žin., 2007, No. 139-5716).

Another document which regulates practical introduction of the measures under the Bathing Water Directive is the Bathing Water Quality Monitoring Programme, which is approved every two years. The key objective of this Programme is to assess the quality of bathing waters, to develop a general management strategy and policy for recreational waters, and to establish new bathing sites.

42. The most important measures of the implementation of the Bathing Water Directive are as follows:

42.1. monitoring of bathing water quality;

42.2. provision of information on the quality of bathing waters to the public;

42.3. official designation of bathing waters;

42.4. improvement of bathing water quality and restoration of poor bathing water quality to good status;

42.5. development of an information system on bathing waters.

Monitoring of the quality of bathing waters

43. 149 bathing waters were monitored in 2008 under the Bathing Water Quality Monitoring Programme for 2006-2008 approved by Resolution No. 773 of the Government of the Republic of Lithuania of 4 August 2006 (Žin., 2006 No. 88-3459): 15 bathing waters in coastal waters (10%), 26 ones – in rivers (17%), 73 – in lakes (49%), 35 – in reservoirs/ponds, quarries, dams (24%). Of these, 114 bathing waters (77%) were subject to regular monitoring, 23 ones (15%) were monitored irregularly and 12 bathing waters were not monitored at all (8%).

To date, there are two official bathing waters in the Lielupė RBD. So far the municipalities are not planning to establish any new ones.

Measures for the implementation of the provisions of the Bathing Water Directive for 2009-2011 are provided for in the Bathing Water Quality Monitoring Programme for 2009-2011 approved by Resolution No. 668 of the Government of the Republic of Lithuania of 25 June 2009 (Žin., 2009, No. 80-3344). The objective of this Programme is to maintain and improve the quality of bathing waters by providing safe conditions for people’s health. The targets of the Programme are as follows: improvement of the management of the monitoring of bathing water quality; systematic monitoring and analysis of microbiological and chemical pollution of bathing waters; identification of short-term pollution or exceptional cases; assessment and classification of the quality of bathing waters and provision of characterisation thereof; provision of information on the quality of bathing waters and on short-term pollution or exceptional cases to the general public and to public authorities.

99 bathing waters were monitored in Lithuania in 2008[16]. Annex 1 to the Bathing Water Quality Monitoring Programme for 2009-2011 contains a List of Monitored Bathing Waters in Lithuania (151 bathing waters in total).

The quality of all bathing waters monitored in 2008 conformed to the mandatory quality requirements[17] hence there is no need for additional investment costs for the implementation of the Bathing Water Directive. The operating costs of the implementation of the Bathing Water Directive consist of costs of recognition of beaches as suitable for use, sampling of bathing water and analysis of water, and provision of information to the public.

Taking into account the present status of the Lithuanian economy, the number of monitored bathing waters is likely to go up having in mind municipal decisions of official designation of bathing waters.

Provision of information on bathing water quality to the public

44. Information on water quality to the general public in Lithuania is provided in the mass media. Following Order No. V-484/D1-273 of the Minister of Health and the Minister of Environment of the Republic of Lithuania of 26 May 2008 on the approval of the Regulations of the Procedure for the Reporting on Bathing Water Quality to the European Commission (Žin., 2008, No. 62-2362), the responsibility for the implementations of the provisions of the Directive related to the collection and assessment of information on bathing water quality and submission thereof to the European Commission lies with the Institute of Hygiene. Also, the Institute of Hygiene is responsible for the assessment of the quality of bathing waters and provision of this information to the public pursuant to Order No. V-1055 of the Minister of Health of the Republic of Lithuania of 21 December 2007 on the approval of the Lithuanian Hygiene Norm HN 92:2007 "Beaches and Bathing Water Quality" (Žin., 2007, No.139-5716). Information on the quality of bathing waters is regularly announced in the press and on the website of the Institute of Hygiene (www.hi.lt).

Official designation of bathing waters

45. There were 99 officially designated bathing waters in Lithuania in 2008, including 2 ones in the Lielupė RBD.

Improvement of bathing water quality

46. The implementation of the Urban Wastewater Treatment Directive also determines the quality of bathing waters hence the measures under this Directive at the same time improve the quality of the existing and potential bathing waters.

Development of an information system on bathing waters

47. The existing information system on bathing waters is rather simple and covers exchange of necessary information between relevant departments, including municipalities. There are plans, however, to connect this system to the database/information system managed by the Environmental Protection Agency.

[16] Report to the European Commission "Bathing water results 2008- Lithuania". Source: Institute of Hygiene: http://www.hi.lt/content/I5_atask_EK.html

[17] Report to the European Commission "Bathing water results 2008- Lithuania". Source: Institute of Hygiene: http://www.hi.lt/content/I5_atask_EK.html

Implementation costs of the Bathing Water Directive

Mūša sub-basin

48. 12 bathing waters were monitored in the Mūša Sub-basin:

48.1. Apaščia River in Dauguviečio Park (Biržai distr.),
48.2. Lake Arimaičių ežeras (Radviliškis distr.),
48.3. Bubių pond (Šiauliai distr.),
48.4. Eibariškių pond (Radviliškis distr.),
48.5. Lake Indubas (Pasvalys distr.),
48.6. Laičių pond (Pakruojis distr.),
48.7. Lėvuo River (Kupiškis distr.),
48.8. Lėvuo River (Panevėžys m.),
48.9. Lėvuo River (Pasvalys distr.),
48.10. Prūdelio pond (Šiauliai city),
48.11. Lake Rėkyva (Šiauliai city),
48.12. Lake Šilas (Pasvalys distr.).

Monitoring of 15 bathing waters is planned in the Mūša Sub-basin in 2009-2011. The following bathing waters have also been included in Annex 1 to the Programme:

48.13. Lake Gudelių ežeras (Šiauliai distr.),
48.14. Quarry in Petrašiūnai (Pakruojis distr.),
48.15. Skalyno quarry (Pakruojis distr.).

The average annual operating costs of the implementation of the Bathing Water Directive in the Mūša Sub-basin total to LTL 68 000. These costs are planned to be funded from municipal budgets under the Bathing Water Monitoring Programme for 2009-2011.

Table 26. Average annual costs of the implementation of the Bathing Water Directive in the Mūša Sub-basin in 2009-2011

Group of costs	Unit	Average unit costs, LTL/year	Unit number in the basin	Annual operating costs in the basin, LTL/year
Recognition of beaches as suitable for use	bathing water	700	15	10 500
Sampling of bathing water and analysis of water	bathing water	3 500	15	52 500
Provision of information to the public on the quality of bathing water	bathing water	340	15	5 100
TOTAL		**4 540**		**68 100**

Source: Bathing Water Quality Monitoring Programme for 2009-2011

Nemunėlis Sub-basin

49. Five bathing waters were monitored in the Nemunėlis Sub-basin in 2008:

49.1. Lake Kilučių ežeras (Biržai distr.),
49.2. Lake Rokiškio ežeras (Rokiškis distr.),
49.3. central bathing site in Lake Širvėnos ežeras (Biržai distr.),
49.4. Youth Park (Jaunimo sodo) bathing site in Lake Širvėnos ežeras (Biržai distr.),
49.5. Lake Vyžuona (Rokiškis distr.).

Four of the bathing waters planned to be monitored in 2009-2011 are situated in the Nemunėlis Sub-basin. All the above-listed bathing waters, with the exception of the one in Lake Kilučių ežeras (Biržai distr.), are included in Annex 1 to the Programme.

The average annual operating costs of the implementation of the Bathing Water Directive in the Nemunėlis Sub-basin total to LTL 18 200. These costs are planned to be funded from municipal budgets under the Bathing Water Monitoring Programme for 2009-2011.

Table 27. Average annual costs of the implementation of the Bathing Water Directive in the Nemunėlis Sub-basin in 2009-2011

Group of costs	Unit	Average unit costs, LTL/year	Unit number in the basin	Annual operating costs in the basin, LTL/year
Recognition of beaches as suitable for use	bathing water	700	4	2 800
Sampling of bathing water and analysis of water	bathing water	3 500	4	14 000
Provision of information to the public on the quality of bathing water	bathing water	340	4	1 360
TOTAL		**4 540**		**18 160**

Source: Bathing Water Quality Monitoring Programme for 2009-2011

Lielupė Small Tributaries Sub-basin

50. No water quality analysis was conducted in the bathing waters within the Lielupė Small Tributaries Sub-basin in 2008.

Four bathing waters are planned to be monitored in the Lielupė Small Tributaries Sub-basin under the Bathing Water Monitoring Programme for 2009-2011. The following bathing waters have also been included in Annex 1 to the Programme:

50.1. Joniškio pond (Joniškis distr.),
50.2. Švėta River (Joniškis distr.),
50.3. Žeimelio dam (Pakruojis distr.),
50.4. Lake Žvilgaičių ežeras (Joniškis distr.).

The average annual operating costs of the implementation of the Bathing Water Directive in the Lielupė Small Tributaries Sub-basin total to LTL 18 200. These costs are planned to be funded from municipal budgets under the Bathing Water Monitoring Programme for 2009-2011.

Table 28. Average annual costs of the implementation of the Bathing Water Directive in the Lielupė Small Tributaries Sub-basin in 2009-2011

Group of costs	Unit	Average unit costs, LTL/year	Unit number in the basin	Annual operating costs in the basin, LTL/year
Recognition of beaches as suitable for use	bathing water	700	4	2 800
Sampling of bathing water and analysis of water	bathing water	3 500	4	14 000
Provision of information to the public on the quality of bathing water	bathing water	340	4	1 360
TOTAL		**4 540**		**18 160**

Source: Bathing Water Quality Monitoring Programme for 2009-2011

Sewage Sludge Directive

51. The Sewage Sludge Directive specifies the conditions under which sewage sludge may be used in agriculture as well as the amount of heavy metals in the soil which is to be fertilised. The Directive has also established the allowable concentrations of heavy metals in sludge and the maximum amount of heavy metals that may enter the soil during a year. The implementation of the Directive should facilitate limitation of the input of heavy metals contained in sludge into the soil.

The study "Investment Programme for Sludge Management in Lithuania" prepared by SWECO BKG in 2006 analysed several ways of sewage sludge handling and emphasised that the use of sludge in agriculture or for the restoration of affected areas is not the best alternative of the sludge use. The priority scheme opted for in the Programme first of all provides for the use of sludge for energy generation. If needed, sludge could be used in agriculture, for fertilising energy forests or restoring affected areas. The Programme has also envisaged that such sludge could be used in agriculture.

52. The key piece of legislation which has transposed the requirements of the Sewage Sludge Directive is the regulatory document LAND 20-2001 "Requirements for the use of sewage sludge for fertilisation" approved by Order No. 349 of the Minister of Environment of the Republic of Lithuania of 29 June 2001 (Žin., 2001, No. 61-2196; 2005, No. 142-5135) (LAND 20-2005).

Measures for the implementation of the Sewage Sludge Directive

Fertilisation plans

53. The regulatory document LAND 20-2005 has laid down that persons intending to use sewage sludge for agricultural purposes must develop fertilisation plans, which have to be coordinated with a relevant Regional Environmental Protection Department (REPD). Fertilisation plans shall be elaborated for six years. These plans are supposed to provide information on soil analysis results and the maximum concentrations of heavy metals which may enter the soil through sewage sludge. However, no data on the annual number of fertilisation plans prepared and agreed with REPD is available, therefore stricter accounting and control of the plan development is required.

Analysis of sludge composition, data storage, banning and withdrawal of dangerous substances from circulation

54. Sludge suppliers must conduct accounting of the quality of sewage sludge, collect information on the ways of sludge processing, amount and uses. Apart from that, information on concentrations of the following metals in sludge must be collected: lead (Pb), cadmium (Cd), chromium (Cr), copper (Cu), nickel (nickel), zinc (Zn), mercury (Hg). LAND 20-2005 has set forth that sewage sludge may be classified into three categories depending on concentrations of heavy metals in sludge.

Measures for the implementation of the requirements of the Sewage Sludge Directive for 2007-2013 are provided for in the List of National Projects under Measure No. VP3-3.1-AM-01-V "Renovation and development of water supply and wastewater treatment system", activity "Development of a sludge management infrastructure". Plans to develop a sludge management infrastructure in Lithuania include construction of sludge processing facilities in 23 towns.

Implementation costs of the Sewage Sludge Directive

Mūša Sub-basin

55. Table 29 provides planned investment projects on the development of sludge management infrastructures in towns located in the Mūša Sub-basin. The total investment costs amount to LTL 72.178 million. It is assumed that the annual operating costs account for 3% of the investment costs.

Table 29. Projects on development of sludge management infrastructures in 2007-2013 in the Mūša Sub-basin

Municipality	Expected project outputs	Preliminary investment costs, LTL million	Operating costs, LTL million per year
Šiauliai city, Šiauliai distr.	1 rotting-drying equipment	72.178	2.2
TOTAL		**72.178**	**2.2**

Source: List of National Projects No. 01 under Measure No. VP3-3.1-AM-01-V "Renovation and development of water supply and wastewater treatment systems, activity "Development of a sludge management infrastructure"

Nemunėlis Sub-basin

56. Table 30 provides planned investment projects on the development of sludge management infrastructures in towns located in the Nemunėlis Sub-basin. The total investment costs amount to LTL 7.8 million. It is assumed that the annual operating costs account for 3% of the investment costs.

Table 30. Projects on development of sludge management infrastructures in 2007-2013 in the Nemunėlis Sub-basin

Municipality	Expected project outputs	Preliminary investment costs, LTL million	Operating costs, LTL million per year
Biržai distr.	1 composting site	7.8	0.23
TOTAL		**7.8**	**0.23**

Source: List of National Projects No. 01 under Measure No. VP3-3.1-AM-01-V "Renovation and development of water supply and wastewater treatment systems, activity "Development of a sludge management infrastructure"

Lielupė Small Tributaries Sub-basin

57. No investment projects related to the implementation of the Sewage Sludge Directive have been planned for the Lielupė Small Tributaries Sub-basin from the financial perspective for 2007-2013.

Plant Protection Products Directive

58. The requirements of the Plant Protection Products Directive are related to the authorisation, placing on the market, use and control of plant protection products. In Lithuania, only approved products of plant protection may be marketed and used, and companies intending to place such products on the market must obtain special permits. All products must be used under the same conditions which are specified on the label and must be stored observing the requirements of the Code of Good Practice for the Use of Plant Protection Products.

To date, there are 215 plant protection products and 140 active substances that may be contained in plant protection products registered in Lithuania.

The aggregate amount of plant protection products consumed within the Lielupė RBD is not available but it is assumed that herbicides and plant growth regulators are mainly used in large farms of intensive agriculture therefore the annual consumption of these products is continuously growing up.

It is difficult to forecast an impact of plant protection products on the quality of groundwater and surface water. This impact would go down if plant protection products were used adequately and in accordance with the recommendations of the Code of Good Practice for the Use of Plant Protection Products. The State Plant Service controls the use of plant protection products.

59. The key legislation transposing the Plant Protection Products Directive:

59.1. Law of the Republic of Lithuania on Plant Protection (Žin., 1995, No. 90-2013; 2010, No. 13-620);
59.2. List of Authorised Active Substances in Plant Protection Products approved by Order 3D-187 of the Minister of Agriculture of the Republic of Lithuania of 19 April 2004 (Žin., 1995, No. 60-2145).

Directive 2009/128/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for Community action to achieve the sustainable use of pesticides was adopted at the end of 2009 (OJ 2009 L 309, p. 71). This Directive laid down a number of more stringent aspects of the use of plant protection products, such as the obligation to:

59.2.1. develop National Action Plans to reduce impacts of pesticide use;
59.2.2. apply the integrated pest management principle;
59.2.3. pay more attention to areas used by the general public (parks and gardens, sports and recreation grounds or residential areas);
59.2.4. ensure that the general public is better informed of the use of pesticides.

The implementation of this Directive will also contribute to the achievement of the objectives under the WFD.

Measures for the implementation of the Plant Protection Products Directive

Authorisation of plant protection products

60. Plant protection products must be authorised before placing them on the market. Active substances contained in plant protection products are authorised by orders of the Minister of Agriculture. To date, over 150 active substances which may be contained in plant protection products have been authorised in Lithuania.

Table 31. Number of plant protection products authorised in Lithuania

Product	Products authorised for professional usage	Products authorised for individual usage
Insecticides	15	7
Fungicides	52	10
Mordants	18	
Herbicides	85	17
Growth regulators	7	
Defoliants	1	
Other	3	
Total	**181**	**34**

Source: website of the State Plant Service

Labelling of plant protection products

61. The Law of the Republic of Lithuania on Plant Protection specifies detailed requirements for the labelling of plant protection, including provision of the name and amount of an active substance, information on danger for health and the environment, and recommendations regarding the product use.

Application of Good Plant Protection Practice

62. The Rules for Good Plant Protection Practice were approved by Order No. 3D-227 of the Minister of Agriculture of the Republic of Lithuania of 26 April 2004 (Žin., 2004, No. 66-2349). The State Plant Protection Services organises annual seminars and trainings for farmers thus encouraging the observance of the said Rules.

Controls of the use of plant protection products

63. The State Plant Service controls the use of plant protection products.

Other measures include studies and analysis of an impact of plant protection measures, withdrawal and prohibition of harmful substances.

Status of the implementation of the Plant Protection Products Directive

64. Lithuania was not granted a transitional period for transposing this Directive so formally it has already been implemented.

The use of plant protection products (PPP) in Lithuania has been increasing and so have the areas sprayed with plant protection products (Tables 32 and 33).

Table 32. Amounts of plant protection products used in Lithuania (in tonnes, by the active substance)

	2000	2001	2002	2003	2004	2005	2006
Insecticides	6.8	6.3	6.2	7.1	5.7	6.8	7.0
Fungicides	109.5	102.3	97.4	101.7	127.8	152.9	159.2
Mordants	52.4	33.5	35.3	28.4	27.3	22.3	42.2
Herbicides	476.9	530.8	576.8	579.1	725.2	732.4	858.9
Defoliants	5.1	1.0	0.4	0.6	0.6	0.7	0.6
Growth regulators	35.7	51.4	60.2	99.2	110.9	123.3	125.7
Others	1.4	22.9	15.9	31.1	26.1	10.1	3.4
Total:	687.8	748.2	792.2	847.2	1 023.6	1 048.5	1 197.0

Source: website of the State Plant Service

Table 33. Area of sprayed utilised agricultural land in Lithuania, thousand ha

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Herbicides	786.5	800.5	859.1	938	1 036.1	1 251.2	1 278.3	1 473.0	1 454
Fungicides	306.3	336.9	357.4	292.5	372.3	425.7	364.2	477.4	507.4
Insecticides	199.7	193.56	393.6	327.9	397.9	397.1	402.6	464.6	412.5
Growth regulators	46.8	67.5	98.6	122.7	157.1	161.9	141.5	152.6	197.2
Defoliants	1.3	3.3	2.7	0.4	1.1	2.2	33.0	1.5	3.5
Total:	1 340.6	1 401.8	1 711.4	1 681.8	1 964.5	2 238.3	2 219.6	2 567.6	2 574.6

Source: website of the State Plant Service

Plant protection inspectors of the State Plant Service carry out assessments of conformity of the packaging, labelling, storage, use and placement of products on the

market with the requirements laid down in relevant legislation. Around 50% of all breaches in 2008 were violations of the requirements for product storage, 20% – for product use, 15% – for placement on the market, 15% – for packaging and labelling. Although no direct breaches in relation to failure to observe water protection requirements were registered, inadequate storage and use of products can be related to pollution of water resources. The said type of violations constitutes the largest share of all breaches.

Table 34. Inspections of PPP carried out and breaches identified in 2007-2008

	2007		2008	
	inspections	breaches	inspections	breaches
Use	2 027	455	2 197	420
Placing on the market	1 411	166	1 387	164
Packaging and labelling	479	137	661	121
Storage	721	151	701	126
Total:	4 638	909	4 946	832

Source: website of the State Plant Service

The data in the tables above demonstrates that the statistics on plant protection products is available only for the entire country. There is no data on the use of plant protection products in individual administrative units. Therefore, distribution of the figures for individual RBD was carried out on certain assumptions.

Assuming that plant protection products in individual river basins or sub-basins are used with more or less the same intensity, the plant protection figures can be distributed in proportion to the areas of agriculture and forests in the basins and sub-basins. Such areas in the Lielupė RBD make up around 19.3% of the total areas in Lithuania. Consequently, following the above-said assumption, the amount of active substances of plant protection products used in this RBD totals to 19% or 231 tonnes.

Implementation costs of the Plant Protection Products Directive

65. Implementation costs of the Plant Protection Products Directive in Lithuania have never been estimated. The main legal, administrative and investment instruments required to ensure the introduction of the Code of Good Practice for the Use of Plant Protection Products in Lithuania, thus reducing pollution of water, were established during interviews with employees of the State Plant Service and regional plant protection inspectors.

The major costs related to potential investments for such measures are required for the acquisition of sprayers and construction of decontamination sites. There are very few such sites in Lithuania. Besides, in the opinion of many inspectors, such sites are not necessary in Lithuania where plant protection products remaining after the main spray are once again sprayed on the fields. Construction of a decontamination site, consisting of a ramp, walls, straw, mixture of peat and humus, etc., can cost from LTL 1 000 to LTL 10 000. No such official sites have been registered by plant protection inspectors in the Lielupė RBD and no construction of the sites here is planned at least until 2015. Consequently, the implementation costs of the Plant Protection Products Directive in the Lielupė RBD are related only to the acquisition and maintenance of sprayers.

All sprayers in Lithuania must have a technical inspection certificate, which is the main disciplinary measure, also having a significant environmental benefit. Inspection costs around LTL 200 and is valid for three years. The price of a sprayer varies a lot

depending on its type. The cheapest and most common ones cost about LTL 4 000-5 000, the price of a sprayer needed for a large farm can be as high as LTL 200 000. The largest number of such most expensive sprayers within the Lielupė RBD is used in Pasvalys district. The majority of sprayers in the RBD are of the said cheaper type. According to the information collected from plant protection products inspectors, their number in the Lielupė RBD totals to approximately 1000: 700 in the Mūša Sub-basin, 200 in the Nemunėlis Sub-basin and 100 in the Lielupė Small Tributaries Sub-basin. About ten sprayers are acquired in each administrative district of Lituania every year. It should be emphasised that this is a very rough estimate because there is no formal accounting of sprayers.

The estimated costs of the acquisition and maintenance of sprayers for farmers in the Lielupė RBD and, consequently, the implementation of the Plant Protection Products Directive are provided in Table 35 below.

Table 35. Implementation costs of the Plant Protection Products Directive in the Lielupė RBD in 2010-2015, LTL

Measure	Amount			Service life	Costs			
	Annual number	Number of years	Total		Unit costs	Investments	Operating costs	Annual costs
Mūša Sub-basin								
New sprayer	40	5	200	10	5 000	1 000 000	10 000	146 000
Technical inspection of new sprayers	40	1	40	3	200	8 000	0	3 000
Technical inspection of the existing sprayers	700	2	1 400	3	200	280 000	0	105 000
Total						1 288 000	10 000	254 000
Nemunėlis Sub-basin								
New sprayer	10	5	50	10	5 000	250 000	2 500	36 500
Technical inspection of new sprayers	10	1	10	3	200	2 000	0	1 000
Technical inspection of the existing sprayers	200	2	400	3	200	80 000	0	30 000
Total						332 000	2 500	67 500
Lielupė Small Tributaries Sub-basin								
New sprayer	10	5	50	10	5 000	250 000	2 500	36 500
Technical inspection of new sprayers	10	1	10	3	200	2 000	0	1 000
Technical inspection of the existing sprayers	100	2	200	3	200	40 000	0	15 000
Total						292 000	2 500	52 500
Total in Lielupė RBD						**1 912 000**	**15 000**	**373 000**

Notes:
* Lielupė RBD covers approximately six administrative districts.
** Technical inspection of new sprayers will be required once during the period in question.
*** Technical inspection of the existing sprayers will be required twice during the period in question.
Source: experts' estimations

Environmental Impact Assessment Directive

66. The main objective of the Environmental Impact Assessment Directive is to assess public or private projects which can have a significant impact on the environment. The Directive requires that all Member States take measures to ensure that relevant procedures of environmental impact assessment (EIA) are carried out before authorising projects which can have a potential impact on the environment. EIA, inter alia, involves assessment of direct and indirect impacts on the aquatic environment.

Having evaluated an EIA report, a responsible institution takes a decision whether a proposed economic activity may be conducted in a selected area. If the decision is negative, such activity may not be started on that territory. EIA is a preventive measure designed to reduce impacts of economic activities on the environmental components, including surface water bodies and groundwater. An impact on the environment is reduced by selecting a most suitable territory, technologies, and construction solutions as well as conditions of the operation of an object.

67. The key piece of legislation transposing the provisions of the Environmental Impact Assessment Directive is the Law of the Republic of Lithuania on Environmental Impact Assessment of the Proposed Economic Activity (Žin., 1996, No. 82-1965; 2005, No. 84-3105). The Law contains two lists of economic activities. The first list specifies economic activities which are subject to EIA before their startup, and the second ones lists economic activities which are subject to screening procedures.

EIA have been carried out in Lithuanian since 1996 when the said Law was passed.

Implementation costs of the Environmental Impact Assessment Directive

68. No estimation of costs of the implementation of this Directive in Lithuania has been carried out yet. A study conducted for the European Commission[18], which analysed 18 cases in a number of EU Member States, indicates that in most cases EIA costs make up less than 0.5% of project investment costs. The smaller the project, the relatively larger are EIA costs.

As a minimum, an EIA process encompasses development of an EIA programme, development of an EIA study, consultations, public participation, review and decision-making. The whole process can be as long as two years though usually the procedure is completed within less than a year.

According to the Environmental Protection Department of Panevėžys Region[19] which covers part of the Lielupė RBD, from 2006 to 2009 decisions were taken in respect of six EIA analyses. Six integrated pollution prevention and control (IPPC) permits were issued in 2007 and 2008.

For the purpose of estimating costs of EIA studies until 2015, it is assumed that three EIA will be carried out per year until 2015 (based on the average figure of the years 2007 and 2008).

The costs of an EIA study depend on a number of factors, such as the size of the investment project, technologies, the natural environment, etc. However, following the

[18] http://ec.europa.eu/environment/eia/eia-studies-and-reports/eia-costs-benefit-en.htm
[19] http://prd.am.lt/VI/index.php#r/76

costs of the existing EIA, the costs of one EIA are estimated at around LTL 70 thousand. Consequently, the implementation of the Environmental Impact Directive in the Lielupė RBD would cost approximately LTL 200 thousand every year, under the baseline scenario. It is assumed that the costs will be evenly distributed in each sub-basin.

IPPC Directive

69. The Directive aims at reducing pollution from industrial sources. An integrated pollution prevention and control permit is the main pollution reduction measure envisaged in the IPPC Directive. IPPC permits must provide for that all activities of a company will be arranged so as to care for the environment, specifying requirements for pollution of air, water and soil, generation of waste, etc. The IPPC Directive contains the requirements to introduce measures designed for rational use of water and reduction of pollution. These measures, which must be specified in integrated pollution prevention and control permit permits, enable ensuring that an impact of economic activities is maximally reduced.

70. The key piece of legislation transposing the requirements of the Directive is the Rules for the Issuing, Renewal and Revocation of Integrated Pollution Prevention and Control Permits approved by Order No. 80 of the Minister of Environment of 27 February 2002 (Žin., 2002, No. 85-3684; 2005, No. 103-3829). The Rules require that all activities listed in Annexes I and II thereto have IPPC permits as from 31 December 2007.

Other legislation which regulates pollution prevention:

70.1. Procedure for the Drafting of Reports on the Implementation of the Council Directive 96/61/EB Concerning Integrated Pollution Prevention and Control and Submission of the Reports to the European Commission approved by Order No. D1-630 of the Minister of Environment of the Republic of Lithuania of 10 December 2004 (Žin., 2004, No. 181-6714);

70.2. Procedure for the Assessment of the Implementation of the Best Available Techniques (BAT) in Industrial Enterprises approved by Order No. D1-526 of the Minister of Environment of the Republic of Lithuania of 16 October 2007 (Žin., 2007, No. 108-4446).

IPPC permits

71. All industrial enterprises engaged in the activities listed in Annexes I and II to the Rules are subject to IPPC permits. The permits first of all require implementation of all available pollution prevention measures and introduction of the BAT. Apart from these general requirements, the permits specify pollution limit values as well as require developing programmes on the reduction of water pollution with priority hazardous substances. Table 36 provides information on IPPC installations in the basins of the Lielupė RBD.

Table 36. Number of IPPC installations in the Lielupė RBD, 2009

Sub-basins	Number of IPPC installations
Mūša Sub-basin	12
Nemunėlis Sub-basin	5
Lielupė Small Tributaries Sub-basin	1
Total in the Lielupė RBD	**18**

Source: EPA data distributed by experts according to the sub-basins

Implementation costs of the IPPC Directive

72. There are 18 installations with IPPC permits in the Lielupė RBD: 9 installations for intensive rearing of pigs, 5 landfills, 2 installations for intensive rearing of poultry, 1 fuel combustion installation, 1 milk treatment and processing installation. The largest number of the installations – twelve – is located in the Mūša Sub-basin. Five installations and one installation are located respectively in the Nemunėlis Sub-basin and Lielupė Small Tributaries

It is hardly likely that new installations subject to IPPC permitting will appear in the Lielupė RBD in the nearest future. New IPPC permits may be required only due to changes in technologies.

The costs of the preparation of IPPC permits vary depending on the size of relevant installations and the technology used. The average costs of IPPC permits used for the estimations in the Lielupė RBD were around LTL 10 thousand for one IPPC permit. It is also assumed that about one fourth of the enterprises operating within the Lielupė RBD may update their technologies by 2015 so that new IPPC permits will be required. Consequently, one-time costs of the implementation of the IPPC Directive in the Lielupė RBD until 2015 would total to approximately LTL 50 thousand: 30 thousand in the Mūša Sub-basin, 12 thousand in the Nemunėlis Sub-basin and 8 thousand in the Lielupė Small Tributaries Sub-basin.

Major Accidents Directive

73. The Major Accidents Directive was adopted in 1996 and focuses on dangerous substances used in installations. It also covers industrial activities where chemical substances are used, and storage of dangerous substances. The Directive provides for certain controls of installations depending on the quantity of dangerous substances used therein.

When the quantity of dangerous substances held by a company is lower than the lower threshold levels given in the Major Accidents Directive, compliance of the company to the general provisions on health, safety and environmental protection shall be checked. When the quantity of dangerous substances is above the upper threshold contained in the Directive, the company shall be subject to all requirements provided for therein.

74. The key national legislation transposing the Major Accidents Directive:

74.1. Regulations of the Prevention, Response to and Investigation of Industrial Accidents approved by Resolution No. 966 of the Government of the Republic of Lithuania of 17 August 2004 (Žin., 2004, No. 130-4649; 2008, No. 109-4159);

74.2. Programme on the Inspection of Dangerous Installations of the Republic of Lithuania approved by Order No. 1-528 of the Director of the State Fire and Rescue Department of 29 December 2006 (Žin., 2007, No. 3-143);

74.3. List of Potentially Dangerous Installations approved by Order No. 539 of the Minister of Environment of the Republic of Lithuania of 11 October 2002 (Žin., 2002, No. 111-4929; 2005, No. 58-2025) .

Measures for the implementation of the Major Accidents Directive are briefly discussed below.

Development of emergency plans and safety reports, measures for accident prevention

75. The Regulations of the Prevention, Response to and Investigation of Industrial Accidents require development of accident prevention plans and safety reports in industries working with dangerous substances. The List of Potentially Dangerous Installations in Lithuania currently contains 21 installations which are subject to the requirements of the Major Accidents Directive.

Selection of sites for potentially dangerous installations

76. The Regulations of the Prevention, Response to and Investigation of Industrial Accidents require that a site for a new installation is selected ensuring a safe distance therefrom to residential areas, roads with intensive traffic, recreational and public areas.

Controls over the implementation of the Major Accidents Directive

77. Programmes on the inspection of dangerous installations are approved each year by orders of the Director of the State Fire and Rescue Department, laying down a schedule of the inspection of dangerous installations. The Programme on the Inspection of Dangerous Installations of the Republic of Lithuania approved by Order No. 1-528 of the Director of the State Fire and Rescue Department of 29 December 2006 (Žin., 2007, No. 3-143) contains a control schedule for 2007. The new Programme also introduced systematic control which is supposed to ensure safe operation of dangerous installations.

Implementation costs of the Major Accidents Directive

78. The costs required for the implementation of this Directive have not been estimated.

No investment costs are required, the main costs are related to the development of emergency plans. Such plans are required for companies which work with dangerous substances and conform to certain size criteria. Besides, the development of plans is not a continuous process, plans are developed at the start-up of the company or change of technologies.

There are 16 enterprises which have been issued IPPC permits in the Lielupė RBD. 12 of these are located in the Mūša sub-basin. At least half of them are installations for intensive rearing of pigs and the other ones are fuel combustion installations, landfills and poultry rearing installations.

5 IPPC installations are located in the Nemunėlis Sub-basin: 2 pig rearing installations, 2 landfills and 1 milk treatment and processing company.

Only one IPPC company is located in the Lielupė Small Tributaries Sub-basin – installations for intensive rearing of pigs.

As in other RBD, it is hardly likely that new installations subject to IPPC permitting will appear in the Lielupė RBD in the nearest future. Emergency plans may be required only due to changes in technologies.

The costs of emergency plans may significantly vary depending on the installation size and the technologies used. Following the experience of plan developers, the costs of one plan under the basic scenario are estimated at LTL 50 thousand. It is also assumed that about one fourth of the IPPC installations operating in the Lielupė RBD may update their technologies by 2015 so that new emergency plans will be required.

Consequently, one-time costs of the implementation of the Major Accidents Directive in the Mūša Sub-basin until 2015 would total to approximately LTL 100 thousand and in the Nemunėlis RBD – LTL 50 thousand. No costs are envisaged for the Lielupė Small Tributaries Sub-basin.

Aggregate costs of the basic measures

79. Aggregate summary costs of the implementation of the key directives during the period until 2015 are given in Table 37 below.

Table 37. Implementation costs of the key water sector directives in the entire Lielupė RBD and in the individual sub-basins during the period until 2015

Directive	Costs		
	Investment costs until 2015, LTL	Operating costs, LTL/year	Annual costs, LTL/year
Mūša sub-basin			
Bathing Water Directive *	0	68 100	68 100
Birds Directive *	1 584 654	599 594	814 594
Drinking Water Directive	together with the costs of the Nitrates Directive		
Major Accidents Directive *	100 000		14 000
Environmental Impact Assessment Directive *		70 000	70 000
Sewage Sludge Directive **	72 178 000	2 165 340	8 458 340
Urban Wastewater Treatment Directive **	165 140 000	3 302 800	17 700 800
Plant Protection Products Directive *	1 288 000	10 000	254 000
Nitrates Directive **	43 379 568	433 796	4 215 796
Habitats Directive *	177 950	641 513	665 513
IPPC Directive *	30 000	0	4 000
Total ~	**283 880 000**	**7 290 000**	**32 270 000**
Nemunėlis Sub-basin			
Bathing Water Directive *	0	18 160	18 160
Birds Directive *	345 660	114 723	161 723
Drinking Water Directive	together with the costs of the Nitrates Directive		
Major Accidents Directive *	50 000		7 000
Environmental Impact Assessment Directive *		70 000	70 000
Sewage Sludge Directive **	7 800 000	234 000	914 000
Urban Wastewater Treatment Directive **	26 670 000	533 400	2 858 400
Plant Protection Products Directive *	332 000	2 500	67 500
Nitrates Directive **	13 912 395	139 124	1 352 124

Directive	Costs		
	Investment costs until 2015, LTL	Operating costs, LTL/year	Annual costs, LTL/year
Habitats Directive *	196 026	160 363	187 363
IPPC Directive *	12 000	0	2 000
Total ~	**49 320 000**	**1 270 000**	**5 640 000**
Lielupė Small Tributaries Sub-basin			
Bathing Water Directive *	0	18 160	18 160
Birds Directive *	10 542	8 886	9 886
Drinking Water Directive	together with the costs of the Nitrates Directive		
Major Accidents Directive *	0	0	0
Environmental Impact Assessment Directive *		70 000	70 000
Sewage Sludge Directive **	0	0	0
Urban Wastewater Treatment Directive **	37 800 000	756 000	4 052 000
Plant Protection Products Directive *	292 000	2 500	52 500
Nitrates Directive **	12 387 907	123 879	1 203 879
Habitats Directive *	25 168	68 874	71 874
IPPC Directive *	8 000	0	1 000
Total ~	**50 520 000**	**1 050 000**	**5 480 000**
Lielupė RBD in total			
Bathing Water Directive *	0	104 420	104 420
Birds Directive *	1 940 856	723 203	986 203
Drinking Water Directive	together with the costs of the Nitrates Directive		
Major Accidents Directive *	150 000	0	21 000
Environmental Impact Assessment Directive *	0	210 000	210 000
Sewage Sludge Directive **	79 978 000	2 399 340	9 372 340
Urban Wastewater Treatment Directive **	229 610 000	4 592 200	24 611 200
Plant Protection Products Directive *	1 912 000	15 000	374 000
Nitrates Directive **	69 679 870	696 799	6 771 799
Habitats Directive *	399 144	870 750	924 750
IPPC Directive *	50 000	0	7 000
Total ~	**383 720 000**	**9 610 000**	**43 380 000**

Notes:
* Calculations of annual (annualised) costs were based on a 10 years service life;
** Calculations of annual (annualised) costs were based on a 20 years service life.
Operating costs were calculated applying the following investment percentage: Sewage Sludge Directive – 3%, Nitrates Directive – 1%.
Source: experts' estimations

Measures for the implementation of the requirements of other articles of the WFD

Practical measures designed to introduce the principle of recovery of water costs (Article 9 of the WFD)

80. Article 9 of the WFD and the Law of the Republic of Lithuania on Water provide for the recovery of the costs of water services pointing out that these costs shall include environmental and natural resources "external" costs and have regard to the polluter pays principle.

81. The national legislation transposing the requirements of Article 9:

81.1. The cost recovery principle has been enacted in the Law of the Republic of Lithuania on Water. Article 31 thereof says: "The costs incurred while aiming to

achieve water protection objectives and providing water services shall be covered by water users."

81.2. The pricing of water services on the basis of the cost recovery principle is described in the Methodology for the Pricing of Drinking Water Supply and Wastewater Management Services approved by Order No. 03-92 of the National Control Commission for Prices and Energy of 21 December 2006 (Žin., 2006, No. 143-5455).

Water pricing

82. Prices of water supply and wastewater collection and management in Lithuania are set observing the cost recovery principle. The price may not be higher than the actual costs of water supply and wastewater collection and management. The price is calculating taking into account the following:

82.1. the number of water meters and the volume of drinking water supplied and wastewater collected;

82.2. activity efficiency and services quality indicators;

82.3. long-term activity and investment plans;

82.4. operating costs;

82.5. water abstraction and water pollution charges.

83. An estimation of the cost recovery level in the sector of water supply and wastewater management demonstrated that the water supply companies operating within the Lielupė RBD recover 87% on their costs on average.

Table 38. Financial recovery of water supply and wastewater management costs in the Lielupė RBD in 2008 and 2009, %

Water supply and wastewater management costs and revenues	Water supply company							Lielupė RBD
	1	2	3	4	5	6	7	
2008	75	92	99	95	72	69	66	80
2009	85	83	103	99	97	83	71	87

Source: experts' estimations on the basis of prices and cost prices of water supply companies

84. At present, the main reason of the failure to fully implement the cost recovery principle in many water supply companies is the delay by municipalities to approve the required tariffs covering the costs.

Environmental costs are included in the cost recovery mechanisms through charges for state natural resources and for pollution of the environment.

Municipalities are currently preparing Water Supply and Wastewater Management Infrastructure Development Plans. 25 such plans were prepared until 2010, 26 were being prepared and the remaining 9 municipalities were only planning to develop of such plans. One of the components of the plans is assessment of the forthcoming tariffs and affordability, hence these plans are believed to have enhanced and to enhance capacities of decision makers in the municipalities. In this way the approval of tariffs based on the cost recovery principle will become more effective.

85. The two main reasons of the failure to fully implement the cost recovery principle in the sector of industry are subsidies and failure to reflect the actual industrial pollution of

water resources in the tariffs of charges for state natural resources and for pollution of the environment. Industrial enterprises usually finance investments to the water sector with their own funds and bank credits. The amount of subsidies to the water sector in Lithuania is rather small. There are two main potential sources of funding:

85.1. EU support granted through mechanisms under the control of the Ministry of Economy, and

85.2. subsidies granted by the Lithuanian Environmental Investments Fund (LEIF).

Until 2007, EU structural support was granted to business (industry included) under the Single Programming Document of Lithuania for 2004–2006 (SPD). More than LTL 1.13 billion of the support administered by the Ministry of Economy was allocated for the implementation of 333 projects during that period. None of these, however, was related to the water sector. Accordingly, the only source of importance for the assessment of cost recovery is subsidies granted by the LEIF.

Only about LTL 1 million of the annual amount of LTL 13 million received from the LEIF was granted to industrial and construction companies for the water sector in 2008 and about LTL 1.7 million – in 2007. As a result of a poor financial situation, only one application of an industrial enterprise was approved for the funding of the water sector in 2009.

Having in mind that industry creates more than LTL 20 billion of the value added, internalisation of LTL 1-2 million (which is the amount of subsidies granted during a more favourable period 2007-2008), i.e. inclusion of such amount into the polluter's costs, does not have any effect on the cost recovery level in the sector of industry.

Today, no reliable data is available on which companies are responsible for emitting certain hazardous substances to rivers, and to what extent. For this reason, the costs of supplementary measures (if any) for the sector of industry cannot be compared to the "external" pollution costs at the moment[20].

Following the afore-said assumption that charges for state natural resources and for pollution of the environment reflect the external environmental costs, it can be maintained that the cost recovery level in the sector of industry is 100%.

86. The cost recovery estimation method used for the public sector cannot be applied for agriculture. The sector of agriculture is not an important direct user of water in Lithuania, the Lielupė RBD included. An important component for estimations is diffuse agricultural pollution which is not included in water or any other costs.

It is very difficult to assess costs of the environment, resources and other expenditure due to agricultural pressures (there are no studies and data available on how much the "value" of water bodies is reduced due to agricultural pollution) hence another estimating method could be applied. In such case it should be assumed that "external"

[20] Deterioration of the environmental status is treated as "external costs" in our economic system. External costs appear when action or failure to act by one individual or a group of individuals has a damaging effect on other individuals or groups. Pollution means negative "external costs". For example, when a factory pollutes a river with untreated wastewater, the downstream water users incur expenses related to health or water treatment. The English equivalent "externality" is sometimes used in other economic areas. It means an external impact, i.e. a benefit or loss caused by an action or process and incurred by a party not related to that action or process.

costs are approximately equal to the agricultural pollution removal costs. This amount in the Lielupė RBD during the first stage of the Management Plan will total to about LTL 9.4 million every year until 2015. LTL 98 thousand of this amount will have to be borne by the state for measures of control. Farmers will have to fund the major part of the costs – LTL 3.45 million. Such agricultural pollution reduction measures would cut down agricultural pollution in areas where it exerts a significant impact.

However, in some areas water bodies are more sensitive to agricultural pollution due to natural conditions of the environment, such as low runoff, etc. In such cases pollution by agriculture can be significant even when loads do not exceed the allowed limits (i.e. when they are not larger than in other places where agricultural pollution is not significant). It is proposed that such additional costs, which would be required in the Lielupė Small Tributaries Sub-basin and Mūša Sub-basin, are borne by the state (through rural support programmes). These costs total to LTL 5.9 million and account for 63 % of the total costs required for the reduction of pollution (LTL 9.35 million, excluding the costs of controls). This means that the polluter pays principle would be implemented in all sub-basins with the cost recovery totalling to 37% because 63% of the required costs will be covered with state subsidies.

However, this is only an a priori assessment meanwhile the actual cost recovery level in agriculture will be identified only in 2015 upon evaluation of farmers' contribution to the implementation of the measures.

Measures to meet the requirements of Article 7 of the WFD

87. Article 7 of the WFD requires:

87.1. identifying all bodies of water used for the abstraction of water intended for human consumption which provide more than 10 m³ a day as an average or serving more than fifty persons, and

87.2. monitoring those bodies of water which provide more than 100 m^3 a day as an average.

88. National legislation transposing the requirements of Article 7:

88.1. Regulations of the Register of the Earth Entrails approved by Resolution No. 584 of the Government of the Republic of Lithuania of 26 April 2002 (Žin., 2002, No. 44-1676; 2006, No. 54-1961). The purpose of the Register is to register underground resources, bore wells and exploration of the entrails of the earth, to collect, accumulate, systematise, store, process, use, and provide data required for the management of the entrails of the Earth and protection of the environment;

88.2. Procedure for Groundwater Monitoring by Economic Entities approved by Order No. 1-190 of the Director of the State Geological Survey under the Ministry of Environment of 24 December 2009 (Žin., 2009, No. 157-7130), which has laid down the procedure for the monitoring of groundwater by economic entities which exert an impact of the environment in order to ensure reduction of pollution or any other negative impact caused thereby.

Identification of water bodies providing more than 10 m^3 of water per day

89. Wellfields abstracting more than 10 m^3 of groundwater per day are registered with the Register of the Earth Entrails.

Identification of water bodies intended for future use

90. The Lithuanian Geological Survey under the Minister of Environment of the Republic of Lithuania has commissioned a project "Assessment of groundwater resources in Lithuania". The targets of the project are as follows:

90.1. to determine the volume of the available groundwater resources, to analyse their quality and potential use in 2007–2025, taking into account the requirements set for the quality of drinking water;

90.2. to develop measures for protection, improvement and quality control of water resources in wellfields;

90.3. to develop a system of information on relations between institutions which analyse and supply groundwater for human consumption and control the quality thereof, and those which design water supply objects and manage resources of water bodies.

As at the end of 2009, the available resources of three groundwater bodies as well as the current and prospective use thereof were assessed.

Monitoring of water bodies which provide more than 100 m^3 of water a day

91. Following the Procedure for Groundwater Monitoring by Economic Entities, all economic entities which abstract more than 100 m^3 of groundwater a day are subject to groundwater monitoring requirements. Every economic entity shall develop a monitoring programme for a period of 3-5 years providing information on the economic entity, type of activity, hydro-geological conditions, etc. The programme shall also indicate the monitoring methodology, frequency, and analysis methods. Economic entities are fulfilling the requirements laid down in relevant legislations and providing information to the Lithuanian Geological Survey in due manner.

Establishment and authorisation of sanitary protection zones of wellfields

92. This measure has been described in the analysis of the implementation of the Drinking Water Directive (Paragraph 10 of the Programme of Measures).

Controls for point source discharges and other activities with an impact on the status of water

93. The legislation which regulates control over point pollution sources:

93.1. Rules for the Issuing, Renewal and Revocation of Integrated Pollution Prevention and Control Permits;

93.2. Wastewater Management Regulation;

93.3. Surface Runoff Management Regulation approved by Order No. D1-193 of the Minister of Environment of the Republic of Lithuania of 2 April 2007 (Žin., 2007, No. 42-1594);

93.4. Programme on the Reduction of Pollution of Waters with Hazardous Substances approved by Order No. D1-259 of the Minister of Environment of the Republic of Lithuania of 13 February 2004 (Žin., 2004, No. 58-2186).

Measures to prevent or control the potential input of pollutants from diffuse sources

94. Legislation which regulates measures for controlling potential input of pollutants:

94.1. Law of the Republic of Lithuania on Water;

94.2. Law of the Republic of Lithuania on Drinking Water Supply and Wastewater Management;

94.3. Requirements for the Protection of Waters against Pollution with Nitrogen Compounds from Agricultural Sources approved by Order No. 452/607 of the Minister of Agriculture of the Republic of Lithuania and the Minister of Environment of the Republic of Lithuania of 19 December 2001 (Žin., 2002, No. 1-14);

94.4. Environmental Requirements for Manure and Slurry Management approved by Order No. D1-367/3D-342 of the Minister of Environment of the Republic of Lithuania and the Minister of Agriculture of the Republic of Lithuania of 14 July 2005 (Žin., 2005, No. 92-3434; 2010, No. 85-4492);

94.5. Programme on the Reduction of Water Pollution from Agricultural Sources;

94.6. Lithuanian Hygiene Norm HN 44:2006 “Delineation and maintenance of sanitary protection zones of wellfields”;

94.7. Rules for the Establishment of Protection Zones for Surface Water Bodies and Protection Belts for Shores approved by Order No. 540 of the Minister of Environment of the Republic of Lithuania of 7 November 2001 (Žin., 2001, No. 95-3372).

The legislation above has provided for general requirements for the protection of surface water bodies and groundwater bodies against pollution from diffuse sources. The requirements are revised on a regular basis and amended if necessary.

Controls over the abstraction of water and measures to promote an efficient and sustainable water use in order to avoid compromising the achievement of the objectives specified in Article 4

95. Legislation which regulates controls over the abstraction of water and measures to promote an efficient use of water:

95.1. Rules for the Issuing, Renewal and Revocation of IPPC Permits;

95.2. Building Technical Regulation STR 2.02.04:2004 “Water abstraction, water preparation. Basic provisions” approved by Order No. No. D1-156 of the Minister of Environment of the Republic of Lithuania of 31 March 2004 (Žin., 2004, No. 104-3848);

95.3. Regulations of the Register of the Earth Entrails. The Regulations were drafted with a view to register underground resources and to collect, accumulate and analyse information on the resources. Groundwater resources are attributed to underground resources hence they are registered in accordance with the provisions of the Register;

95.4. Form 1-PV for quarterly reports on groundwater abstraction and explanation of its compilation approved by Order No. 1-10 of the Director of the State Geological Survey under the Ministry of Environment of the Republic of Lithuania of 19 February 2003 (Žin, 2003, No. 19-849);

95.5. Procedure for the Use of Surface Water Bodies for Water Abstraction Purposes approved by Order No. D1-302 of the Minister of Environment of the Republic of Lithuania of 2 June 2008 (Žin., 2008, No. 64-2439).

IPPC permits

96. IPPC permitting requirements are applicable to companies which abstract, consume or supply groundwater and surface water (including for hydropower purposes). The permits shall specify the water source, water abstraction capacity of the facilities, m^3/s, the volume of the water abstracted, presence of water accounting equipment, etc. The permits shall also provide for measures for the rational use and protection of water.

Controls over the abstraction and sustainable use of surface water

97. Water abstraction sites must be designed taking into account the relevant category, hydrological characteristics of the water body, the maximum and the minimum water levels according to estimated probabilities, the requirements laid down by institutions engaged in the protection and use of water, the Centre of Hygiene, as well as the requirements set for the protection of fish resources and waterways. Water abstraction sites shall not be established within ship movement zones, zones of sedimentation of outwash materials, fish wintering and spawning places, potential shore erosion sites, places of accumulation of plants and floating materials, places of formation of ice and trash-ice, and beaches. Water abstraction sites must be selected upstream of a wastewater discharger, settlement, or site of intensive economic activities.

Entities engaged in water abstraction shall declare the abstracted amount. The Environmental Protection Agency accumulates the information received in its data bases.

With a view to ensure good status of waters within the Lielupė RBD, the amount of surface water abstracted may not exceed the critical values: 1) the aggregate volume of water abstracted and not returned to a catchment may not be higher than 5% of the average annual river discharge in the river cross-section downstream of the water abstraction site; 2) depending on water abstraction periods, the aggregate volume of water abstracted may not account for more than 10% of the annual average river discharge of the 30 driest days during a summer or winter season in the water abstraction site.

Controls over groundwater abstraction and sustainable use

98. Control of groundwater use falls within the responsibility of the Lithuanian Geological Survey. All economic entities which abstract more than 10 m^3 of groundwater per day for the purposes of drinking water supply or for industrial needs must fill in forms of quarterly water abstraction reports pursuant to the Procedure for the Submission of Reports on Groundwater Abstraction. The Lithuanian Geological Survey registers the information on water consumption received in its data bases.

Controls over the impoundment of water

99. Controls over the impoundment of water can be preventive, i.e. restricting the use of water in ponds (e.g. requiring to provide environmental flow, abstain from violating the specified fluctuation of water levels in a pond) and/or prohibiting any kind of dams (ponds), and those which require investments, such as building environmental facilities in impounded places (e.g. fish passes, fish diversion screens, automatic meters of water levels) and removal of old dams for improving conditions for fish migration.

The controls over the impoundment of water are provided for in the below-listed Lithuanian legislation.

99.1. Law of the Republic of Lithuania on Water

No separate permit for a water use is needed for the construction and use of waterworks. No permit is required when a water use does not have a significant impact on the physical, chemical and biological characteristics of a water body. Limits for a water use and/or impact above which a permit is required are established by an institution which is empowered by the law to regulate the issuance of permits. A procedure for the use and maintenance of ponds is laid down by the Minister of Environment who issues respective legal acts. Construction and use of waterworks is subject to a number of measures regulating the regime of water levels, environmental flow, water accounting, management of erosion processes, and fish protection.

99.2. Law of the Republic of Lithuania on Environmental Impact Assessment of the Proposed Economic Activity

This Law regulates the process of environmental impact assessment of the proposed economic activity and relationships between the participants in this process.

Waterworks – dams and ponds subject to an environmental impact assessment – are contained in two lists of economic activities:

99.2.1. The following activities are subject to an environmental impact assessment:

99.2.1.1. construction of dams and other installations designed for the holding back or permanent storage of water (where the amount of water exceeds 5 million m^3 or the area of water surface exceeds 250 hectares);

99.2.1.2. transfer of the flow between river basins (where the amount of water transferred is equivalent to or exceeds 100 million m^3/year) or works for the transfer of water resources between river basins (where the multi-annual average flow of the basin of abstraction is equivalent to or exceeds 2 000 million m^3/year and where the amount of water transferred is equivalent to or exceeds 5% of this flow).

99.2.2. Economic activities subject to screening for an environmental impact assessment:

99.2.2.1. construction of dams and other installations designed for the holding back or permanent storage of water (the amount of water less than 5 million m^3 but exceeding 200 000 m^3 or the area of water surface less than 250 hectares but exceeding 10 hectares);

99.2.2.2. construction of hydropower plants (hydroelectric power plants, windmills, sawmills or other power plants using the accumulated hydropower) (with an output of more than 0.1 megawatts).

99.3. Law of the Republic of Lithuania on Protected Areas

It is prohibited to dam natural rivers and to set up larger water bodies in reserves which are areas of conservational protection priority. It is allowed to re-erect former dams, to set up ponds and other waterworks structures only in cases when this is required for the restoration and management of the objects of cultural heritage (immovable heritage properties) located in a reserve (unconditionally, in strict reserves), and when implementing natural disaster prevention measures in cities, towns and villages.

99.4. Standard Rules for the Use and Maintenance of Ponds (LAND 2-95) (hereinafter – the Standard Rules) approved by Order No. 33 of the Minister of Environment of the Republic of Lithuanian of 7 March 1995 (Žin., 1995, No. 70-1790; 2006, No. 101-3915)

The Standard Rules is the main piece of legislation regulating the use and maintenance of ponds, impounded lakes and respective waterworks. It is intended for the owners, operators and users of these ponds. A separate section discusses ponds designated for hydropower. The last amendment of the Standard Rules has set a deadline for the introduction of automatic devices for the measurement and registration of the water level, and requires performing control measurements of discharges and water levels.

99.5. Resolution No. 1144 of the Government of the Republic of Lithuania of 8 September 2004 on the approval of the List of Ecologically or Culturally Valuable Rivers or River Stretches (Žin., 2004, No. 137-4995)

This is a piece of secondary legislation pursuant to paragraph 3 of Article 14 of the Law of the Republic of Lithuania on Water, which unconditionally prohibits construction of dams for any purposes in 169 rivers and their stretches (recently, this List has been slightly reduced). The key legal bases are as follows: fish species listed in the Red Book of Lithuania; species protected under the Directive on the conservation of natural habitats and of wild fauna and flora; species protected under the Bern Convention on the Conservation of European Wildlife and Natural Habitats; rivers where salmons in Lithuania are protected under the Programme of Restoration and Conservation of Salmons of HELCOM, International Baltic Sea Fishery Commission and Lithuania. This List also includes rivers where no reserves are situated.

99.6. Procedure for the Estimation of the Environmental Water Flow approved by Order No. D1-382 of the Minister of Environment of the Republic of Lithuania of 29 July 2005 (Žin., 2005, No. 94-3508)

This legal act has laid down the procedure for the estimation of the environmental flow in water bodies and for the provision thereof into the tail bay of ponds or impounded lakes, which is mandatory for all natural and legal persons designing, building and reconstructing, repairing, and operating waterworks. The environmental flow is needed to ensure discharges required for the existence of ecosystems in water bodies.

99.7. List of Dams where Facilities for Fish Migration are Required and List of Former Dam Remains where Barriers for Fish Migration Have to Be Removed approved by Order No. 3D-427 of the Minister of Agriculture of the Republic of Lithuania of 25 September 2007 (Žin., 2007, No. 102-4180)

The lists contain 28 dams and dam remains of 33 former watermills where conditions for fish migration should be improved as described above.

99.8. Order No. 68 of the Minister of Environment of the Republic of Lithuania of 23 February 2000 on measures for fish protection in small hydropower plants (Žin., 2000, No. 19-471)

This piece of legislation gives the number of fish allowed to be injured in hydro turbines, recommends power generators to select turbines which have the least potential impact on hydrobiont species when constructing new or reconstructing former hydropower plants, specifies various fish protection measures, and proposes to restrict operation of HPP during fish migration.

99.9. Building Technical Regulation STR 2.02.03:2003 “Fish bypass facilities. Basic provisions” approved by Order No. 565 of the Minister of Environment of the Republic of Lithuania of 17 November 2003 (Žin., 2003, No. 119-5449)

The Building Technical Regulation establishes technical requirements for fish bypasses. The main purpose of fish bypasses is to let actively migrating fish pass from one bay to another during their migration period ensuring conditions necessary for their life in Lithuanian water flows. The most important actively migrating fish include salmonid fishes (salmon and sea trout) as well as other fishes contained in the list of preserved and protected fish.

99.10. Regulations of the State Cadastre of Rivers, Lakes and Reservoirs of the Republic of Lithuania approved by Resolution No. 1114 of the Government of the Republic of Lithuania of 19 September 2000 (Žin., 2000, No. 80-2422; 2009, No. 103-4318)

The State Cadastre of Rivers, Lakes and Reservoirs of the Republic of Lithuania was officially established in 2001. Before that, data on ponds (dams) was published by various organisations. This Cadastre requires publishing the data of ponds larger than 0.5 ha. The Cadastre contains more than 1 100 ponds and their dams and does not include, due to the said area restriction, ruined dams of old watermills, or remains of other waterworks.

Controls over hazardous substances provided for in Article 16 of the WFD

100. Article 16 of the WFD requires providing for specific measures against pollution of water with individual pollutants or groups of pollutants presenting a significant risk to or via the aquatic environment, including such risks to waters used for the abstraction of drinking water. For those pollutants measures shall be aimed at the progressive reduction and, for priority hazardous substances, at the cessation or phasing out of discharges, emissions and losses.

101. Legislation which regulates abatement of water pollution with individual pollutants or pollutant groups:

Wastewater Management Regulation regulates discharge of hazardous and priority hazardous substances in wastewater.

Establishment of the maximum allowable concentrations

102. The Wastewater Regulation requires that all economic entities discharging wastewater polluted with hazardous substances abide by the requirements set for the concentration of hazardous substances. Different maximum allowable concentrations (MAC) have been set for wastewater discharged into the natural environment and for wastewater discharged into wastewater collection systems. The Regulation has also laid down a requirement to reduce discharge of hazardous substances in wastewater to the maximum extent. The annexes to the Regulation contain tables which specify:

102.1. maximum allowable concentrations for priority hazardous substances;

102.2. maximum allowable concentrations for hazardous and other controlled substances;

102.3. controlled parameters of industrial discharges by types of pollution sources.

Monitoring of hazardous and priority hazardous substances by economic entities

103. Depending on the type of economic activity, economic entities have to conduct monitoring of discharge of hazardous substances every two or three years.

Monitoring of hazardous substances in surface waters

104. Monitoring is carried out under the National Environmental Monitoring Programme for 2005-2010 approved by Resolution No. 130 of the Government of the Republic of Lithuania of 7 February 2005 (Žin., 2005, No. 19-608) and amended by Resolution No. 830 of the Government of the Republic of Lithuania of 27 August 2008 (Žin., 2008, No. 104-3973). Monitoring of hazardous substances during the implementation of the Plan will be performed under a new National Environmental Monitoring Programme.

Measures to reduce the impact of accidental pollution incidents

105. These measures are designed to prevent, respond to and investigate large-scale industrial accidents and to promote safe use of dangerous installations, protect people and the environment in case of accidents in such installations, and to limit consequences of industrial accidents on people and the environment.

106. Measures for the prevention and reduction of pollution generated during accidents have been provided for in the following legislation:

106.1. Regulations of the Prevention, Response to and Investigation of Industrial Accidents;

106.2. Programme on the Inspection of Dangerous Installations of the Republic of Lithuania approved by Order No. 1-528 of the Director of the State Fire and Rescue Department of 29 December 2006 (Žin., 2007, No. 3-143).

107. Measures for the prevention and response to industrial accidents are as follows:

107.1. Drafting of safety reports and emergency response plans

The Regulations of the Prevention, Response to and Investigation of Industrial Accidents provide for that all installations which store a certain amount of dangerous substances must prepare safety reports. Such safety reports must also contain plans of measures for accident prevention. The List of Potentially Dangerous Installations includes 21 installations in Lithuania subject to the requirements of the Major Accidents Directive.

107.2. Selection of a suitable place

The Regulations of the Prevention, Response to and Investigation of Industrial Accidents require that a place for the construction of all new dangerous installations must be selected ensuring a safe distance from other dangerous objects, residential areas, roads with intensive traffic, recreational zones, and other public or frequently visited places.

107.3. Controls over the fulfilment of the requirements

Programmes on the inspection of dangerous installations which are approved by the Director of the State Fire and Rescue Department on the annual basis specify a schedule of inspection of dangerous installations. The main purpose of these programmes is to

introduce a regular system of control and to ensure safe operation of dangerous installations.

Measures prohibiting unauthorised discharges of pollutants directly into groundwater

108. Legislation:

The issuance of permits is regulated pursuant to the Procedure for the Inventory of Discharges of Hazardous Substances into Groundwater and Collection of Information Thereon approved by Order No. 1-06 of the Director of the Lithuanian Geological Survey under the Ministry of Environment of 3 February 2003 (Žin., 2003 No. 17-770).

The Lithuanian Geological Survey issues permits for companies abstracting hydrocarbons and thermal water in western Lithuania. Water is discharged into the same geological strata from which hydrocarbons and/or thermal water have been extracted ensuring that these strata will never be suitable for any other purposes due to natural reasons. Such discharges should not contain any other substances but those which are formed during the said activity.

Summary of controls over point source discharges and other activities with an impact on the status of water

109. Pollution by point sources is regulated in the Wastewater Management Regulation and the Rules for the Issuing, Renewal and Revocation of Integrated Pollution Prevention and Control Permits.

Measures for flood control

110. Legislation:

110.1. Civil Protection Law of the Republic of Lithuania (Žin., 1998, No. 115-3230; 2009, No. 159-7207);

110.2. Procedure for Flood Risk Assessment and Management approved by Resolution No. 1558 of the Government of the Republic of Lithuania of 25 November 2009 (Žin., 2009, No. 144-6376). Pursuant to the said Resolution, the Ministry of Environment has to:

110.2.1. draw up and approve preliminary flood risk assessment reports not later than by 22 December 2011;

110.2.2. discuss and approve, if required, preliminary flood risk assessment reports and amendments thereof not later than by 22 December 2018, and afterwards – every six years;

110.2.3. draw flood threat maps and flood risk maps and submit these to the Government of the Republic of Lithuania for approval not later than by 22 June 2013;

110.2.4. prepare flood risk management plans and submit these to the Government of the Republic of Lithuania for approval not later than by 22 June 2015.

Measures which ensure that hydromorphological conditions of water bodies are consistent with good ecological status or good ecological potential for artificial or heavily modified water bodies

111. Legislation:

111.1. Procedure for the Estimation of the Environmental Water Flow (LAND-22-97) approved by Order No. D1-382 of the Minister of Environment of the Republic of Lithuania of 29 July 2005 (Žin., 2005, No. 94-3508)

This legal act has laid down the procedure for the estimation of the environmental flow in water bodies and for the provision thereof into the tail bay of ponds or impounded lakes, which is mandatory for all natural and legal persons designing, building and reconstructing, repairing, and operating waterworks. The environmental flow is needed to ensure discharges required for the existence of ecosystems in water bodies.

111.2. List of Dams where Facilities for Fish Migration Are Required and List of Former Dam Remains where Barriers for Fish Migration Have to Be Removed

The lists contain 28 dams and dam remains of 33 former watermills where conditions for fish migration should be improved. Taking into account a remark of the Lithuanian Hydropower Association on preservation of old dams which are objects of heritage, before the removal of dam remains, it is recommended to check whether these stand on the list of objects of cultural heritage.

111.3. Order No. 68 of the Minister of Environment of the Republic of Lithuania of 23 February 2000 on measures for fish protection in small hydropower plants (Žin., 2000, No. 19-471; 2003, No. 78-3583)

This legal act gives the number of fish allowed to be injured in hydro turbines, recommends power generators to select turbines which have the least potential impact on hydrobiont species when constructing new or reconstructing former hydropower plants, specifies various fish protection measures, and proposes to restrict operation of HPP during fish migration.

Until now, a potential impact of waterworks (dams) and other morphological alterations on river ecosystems and river bed processes has not been adequately studied in Lithuania. The present Programme of Measures recommends a number of measures ensuring conformity of hydromorphological conditions of water bodies with the required ecological status or good ecological potential in water bodies designated as artificial or heavily modified.

Measures for water bodies which are unlikely to achieve the environmental objectives set out under Article 4

112. Lithuanian legislation provides for certain exceptions for water bodies where water protection objectives cannot be achieved or achievement would be disproportionally expensive:

112.1. postponing of an objective (maximum until 2027) if the accomplishment thereof is prevented by technical possibilities, disproportionate costs or natural conditions;

112.2. in the procedure laid down by the Minister of Environment, water bodies heavily modified by anthropogenic activities may be subject to less stringent water protection objectives ensuring that such less stringent objectives will not decrease the status of a

water body in questions.

The exceptions may be applied only upon well-founded proof of the necessity of the derogation.

Details of supplementary measures identified as necessary to meet the environmental objectives

113. Supplementary measures will be proposed for water bodies which will be failing to meet good water status requirements after the implementation of the basic measures, and environmental and economic efficiency of these measures will be evaluated. Supplementary measures have been defined for reduction of point and diffuse pollution, improvement of hydromorphological status, and reduction of an impact of recreation. These are described below.

Details of measures to avoid increase in pollution of marine waters in accordance with Article 11 (6)

114. This provision is relevant only for water bodies within the Nemunas RBD and, partially, within the Venta RBD.

Measures to mitigate temporary deterioration in the status of water bodies if this is the result of circumstances of natural cause or force majeure which are exceptional or could not reasonably have been foreseen

115. Measures to prevent and mitigate pollution arising from unforeseen accidents (which are always unpredictable) have been provided for in the following legislation:

115.1. Regulations of the Prevention, Response to and Investigation of Industrial Accidents;

115.2. Programme on the Inspection of Dangerous Installations.

Emergency plans provide for ensuring protection of people and the environment in the event of emergencies as well as mitigation of negative impacts of accidents on people and the environment.

Controls over artificial recharge or augmentation of groundwater bodies

116. These measures are not relevant for Lithuania because there is no artificial recharge/augmentation of groundwater in our country.

Other basic measures

117. In addition to the above-listed basic measures, other instruments and programmes which correspond to the basic measures are currently implemented or being planned.

117.1. Programme on the Reduction of Water Pollution from Agricultural Sources

The objective of the Programme is to reduce pollution of surface waters and groundwater with nutrients, especially nitrogen and phosphorus compounds coming from agricultural sources with a view to continuously improve the status of water bodies and prevent eutrophication of surface water bodies.

Implementation period: 2008-2012.

Measures:

117.1.1. training of farmers, provision of information thereto, promotion of environment-friendly farming technologies, and encouragement of participation in activities under the Lithuanian rural development measures for 2007-2013;

117.1.2. enhancement of legal regulation ensuring the implementation of the EU and international requirements to reduce agricultural pollution;

117.1.3. continuous monitoring of the status of the soil and water bodies, identification of possibilities to improve the surface water monitoring network;

117.1.4. scientific research aimed at solving the issues of optimal capacities of manure storages and rational use of fertilisers in agriculture;

117.1.5. collection of information on fertilisers use, which would enable accurate assessment of the agricultural impact on water bodies;

117.1.6. provision of conditions for the construction of manure, slurry and wastewater storages on farms holding from 10 to 300 LSU.

Financing sources of the Programme: funds of natural and legal persons, EU funds, allocations from the state budget of the Republic of Lithuania, and other funds.

117.2. Groundwater Use and Protection Strategy for 2002–2010 approved by Resolution No. 107 of the Government of the Republic of Lithuania of 25 January 2002 (Žin., 2002, No. 10-362)

The objective of the Strategy is to ensure provision of drinking water of high quality to the public and to preserve it for future generations.

Implementation period: 2002-2010.

Measures:

117.2.1. analysis of groundwater resources, their quality and possibilities of use (analysis of regional resources of fresh water, possibilities of provision of good quality drinking water to rural population, etc.);

117.2.2. analysis of natural protection of groundwater resources, assessment of the anthropogenic impact on groundwater and preparation of adequate management programmes (inventory of polluted areas and other potential pollution sources, identification of their impact on groundwater and preparation of reclamation programmes for these areas; inventory of bore wells which are no longer in use and which are in a bad technical condition, development of adequate rehabilitation programmes, etc.);

117.2.3. collection of information necessary for the use and protection of groundwater resources (transboundary, national and municipal monitoring; management of the Register of the Earth Entrails, etc.);

117.2.4. settlement of issues related to the development of the use and protection of groundwater (drafting of documents required for the preparation of water management plans of different levels as well as for various other regional and territorial activities in relation to the use and management of groundwater resources, etc.);

117.2.5. dissemination of information on groundwater resources, their quality, use, and protection (publishing geological and hydro-geological information, preparation of a map of the Lithuanian groundwater resources, etc.).

117.3. Programme on the Assessment and Use of Groundwater Resources for the Provision of Drinking Water for 2007–2025

The main objective of this Programme is to update, taking into account the global practice, information on water resources and their proper use while expanding and designing new water supply systems every 20-25 years; to create a new database for information on raw groundwater resources intended for the provision of good quality drinking water to the Lithuanian population during the coming 20-25 years; to create a database of systematised new data on groundwater resources which is necessary for the development of projects on the expansion of water supply systems in Lithuanian towns and rural settlements, and management thereof on the basin level.

Tasks provided for in the Programme:

117.3.1. to quantify the available groundwater resources, to assess their quality (taking into account changes in the water quality due to its use) and a possibility to use these resources in the period 2007–2025 on the basis of the latest hydro-geological information collected during the last 25 years, applying advanced mathematical modelling methods and taking into consideration the EU requirements for the quality of drinking water;

117.3.2. to develop measures for the protection, improvement and quality control of the resources of wellfields (to identify the actual area of formation of groundwater bodies (impact zones) and potential changes therein during their use period 2007-2025; to identify all potential points of pollution of the underground hydrosphere and to examine the scope of a threat for the quality of groundwater bodies, etc.);

117.3.3. to create an interdepartmental information system connecting institutions engaged in water analysis, supply and quality control as well as those which design waterworks and manage water basin resources (to identify and define groundwater resources and various activities related to their assessment and use as well as information structures and flows, and to include new institutions; to design an information system providing for its connection with other information systems and links with the sub-systems of the information system GEOLIS of the Lithuanian Geological Survey);

117.3.4. to conduct scientific research focused on regional problems of the formation of the chemical composition of groundwater (to determine the origin of chloro-organic compounds and polycyclic aromatic hydrocarbons in groundwater, the amount of boron and pesticides therein and their impact on the quality of drinking water resources, etc.).

This Programme is financed with funds allocated for its implementation from the state budget of the Republic of Lithuania to the manager of the appropriations – the Lithuanian Geological Survey and, if possible, with funds allocated for this purpose by international organisations or other funds, following the procedure laid down in relevant legislation.

117.4. Drinking Water Supply and Wastewater Management Development Strategy for 2008-2015

The objectives of the Strategy are as follows:

117.4.1. to provide for favourable conditions for the improvement of accessibility and quality of drinking water supply and wastewater management services;

117.4.2. to protect the environment from an adverse impact of discharges into the environment.

The Strategy is to be implemented in two stages: during 2008–2009 and 2010–2015.

Tasks for 2008–2009:

117.4.3. to improve legislation which regulates drinking water supply and wastewater management services and development of infrastructures and which lays down environmental requirements for wastewater management;

117.4.4. to inform consumers about safety and quality of publicly supplied water;

117.4.5. to approve a list of water supply and wastewater management projects financed from the EU Structural Funds.

In 2009, the Ministry of Environment of the Republic of Lithuania developed the Plan of Measures for 2010-2015 and submitted it to the Government of the Republic of Lithuania.

The measures for implementing this Strategy are financed from general appropriations approved for relevant institutions in the Law on the Approval of the Financial Indicators of the State and Municipal Budgets of a respective year, and with other funds received in the procedure laid down in the relevant legislation of the Republic of Lithuania.

117.5. National Strategy for the Implementation of the United Nations Framework Convention on Climate Change by 2012 approved by Resolution No. 94 of the Government of the Republic of Lithuania of 23 January 2008 (Žin., 2008, No. 19-685)

The main objective of this Strategy is to fulfil the requirements of the United Nations Framework Convention on Climate Change and Kyoto Protocol and to reduce greenhouse gas emission in 2008–2012 by 8% below 1990 levels.

The main tasks:

117.5.1. to organise and to conduct continuous and ongoing monitoring of the Lithuanian climate indicators, to provide data on hydro-meteorological conditions and phenomena which is necessary for the assessment of the current state and preparation of forecasts, to accumulate and store necessary data on the climate state and changes;

117.5.2. to conduct assessments of the landscape, ecosystems and biological diversity (including protected areas) for the purpose of evaluating impacts of the changing climate on various ecosystems and parts thereof, to develop plans for the mitigation of impacts of climate change, to provide for specific adjustment measures for the conservation of the landscape, ecosystems and biological diversity (including the development and implementation of river renaturalisation projects, measures for wastewater treatment, safe handling of sludge, etc.);

117.5.3. to draft legislation, recommendations, promotion measures and assistance programmes which facilitate reduction of greenhouse gas emissions and help these sectors to adjust to alterations caused by climate change as well as to increase energy efficiency;

117.5.4. to introduce measures which reduce greenhouse gas emissions in wastewater management and to adjust their storage facilities to potential climate changes;

117.5.5. to develop scientific research, including technologies designed for the assessment and mitigation of consequences of climate change;

117.5.6. to provide information to the public on climate change, potential threats, measures for the mitigation of consequences, to raise public awareness on combating climate change.

The measures provided for in this Strategy are financed from the general appropriations allocated for institutions in the state budget of the Republic of Lithuania.

117.6. Lithuanian Rural Development Programme for 2007-2013. Measures provided for under Axis I and II

Table 39. Environmental measures under the Lithuanian Rural Development Programme for 2007-2013

Measure	**Description**
AXIS I "Improving the competitiveness of the agricultural and forestry sector"	
"Vocational training and information actions" (Articles 20(a)(i), Article 21, Article 52(c) and Article 58 of the Council Regulation (EC) No. 1698/2005)	Special focus is given to trainings introducing mandatory legislation, economy management and agri-environmental requirements.
"Use of advisory services" (Article 20(a)(iv) of the Council Regulation (EC) No. 1698/2005)	This measure covers assessments of farms and consultation of farmers on conformity of farms to good agri-environmental practice as well as consultation of farmers on the implementation of agri-environmental measures.
"Modernisation of agricultural holdings" (Article 20(b)(i) and Article 26 of the Council Regulation (EC) No. 1698/2005) (including obligations under the Measure "Agri-environmental commitments", RDP 2004–2006 (Article 21(b) and Article 21(c) of the Council Regulation (EC) No. 1257/1999)	One of the areas under this Measure is intended for the implementation of the requirements of the Nitrates Directive on farms with less than 10 LSU, reducing water pollution and focusing on nitrates and other chemical factors which are likely to have an adverse impact on public health, biological diversity and to change the traditional landscape. Another objective is to protect water bodies in the Republic of Lithuania against eutrophication.
AXIS II "Improving the environment and the countryside"	
"Agri-environment payments" (Article 36(a)(iv) and Article 39 of the Council Regulation (EC) No. 1698/2005) (including obligations under the Measure "Agri-environment payments", RDP 2004–2006 (Articles 22-24 of the Council Regulation (EC) No. 1257/1999)	The objective is to promote sustainable use of land, prevent deterioration of biological diversity and degradation of ecosystems, to preserve natural shores of rivers and lakes, to preserve and properly maintain natural and semi-natural grasslands and extensively used wetlands, recreational environment, to ensure effective use of natural resources, to protect the landscape and biological diversity, to reduce an adverse impact of agriculture on the environment in water bodies which have been identified as water bodies at risk of failing to achieve good status by 2015.
Landscape Stewardship Scheme	The objective is to preserve and properly maintain natural and semi-natural grasslands, wetlands, recreational environment, to preserve or, if needed, to restore extensive farming systems in grasslands and wetlands, to reduce farming intensiveness in intensively used grasslands, to protect biological diversity and water bodies against pollution.
Organic Farming Scheme	The objective of the Scheme is to support ecological farming as a production system which ensures production of quality food products with good prospects on the market. It is an important agri-environmental measure because it helps maintain and improve the soil quality, reduce air and water pollution, and preserve stability of ecosystems as well as biological diversity.
Scheme for Improving the Status of Water Bodies at Risk	The objective of the Scheme is to achieve good status in water bodies which have been identified as water bodies at risk of failing to achieve good status by 2015 (as required under the

Measure	Description
	WFD and the Republic of Lithuania Law on Water) because of a highly significant adverse impact of agriculture (pollution of water with nutrients and organic matter).
Natura 2000 payments and payments linked to the WFD (support to agricultural land in Natura 2000 areas) (Article 38 of the Council Regulation (EC) No. 1698/2005)	The measure is important for the implementation of the WFD. The implementation of the WFD is postponed until the approval of the river basin management plans and establishment of comprehensive rules of support. The objective is to address specific difficulties encountered in relevant places in relation to the implementation of the Birds Directive, Habitats Directive and WFD, thus enhancing living quality in rural areas and raising ecological awareness of local communities. **A specific objective** is to implement environmental requirements in Natura 2000 areas with a view to protect wild birds, natural habitats, protected species and their habitats.

117.7. Cohesion Promotion Action Programme approved by the Commission Resolution of 30 July 2007 (not published)

This Programme corresponds to the third priority of the use of the EU structural support "Life quality and cohesion". The total amount of the EU structural funds allocated for the Programme under the Convergence objective is EUR 2 648 332 571 (the allocation for "Environment and sustainable development" totals to EUR 1 128 119 555). The Programme is financed from the European Regional Development Fund and Cohesion Fund (for the protection of the environment).

The objectives of the Cohesion Promotion Action Programme:

117.7.1. to provide for conditions necessary for strengthening and unlocking local potential;

117.7.2. to offer accessible quality public services provided by institutions which implement health, education, and state support for employment policies, ambulatory social services, and services for the disabled;

117.7.3. to seek better quality of the environment, with particular emphasis on especially increasing energy efficiency.

The attainment of the third objective focuses on the improvement of the status in water bodies and implementation of the provisions of the WFD, Urban Wastewater Treatment Directive, and other directives which regulate water protection and use. The following tasks have been set:

117.7.4. to renovate and develop water supply and wastewater treatment systems;

117.7.5. to identify water protection and management measures: to develop management plans, programmes of measures for the Nemunas, Lielupė, Lielupė, and Dauguva River Basin Districts, as well as other documents necessary for the establishment of water protection objectives; to carry out preliminary assessments of flood risks in the Nemunas, Lielupė, Lielupė, and Dauguva River Basin Districts; to develop maps of flood threats and risks and flood risk management plans;

117.7.6. to improve the ecological and/or chemical status of surface water bodies – to implement measures designed for the improvement of the status of water bodies (transitional waters, rivers and lakes), such as treatment and handling; restoration of a more natural hydrological regime; reduction of the input of pollutants into water bodies; environmental cleanup and rehabilitations of banks).

Effect of implementation of basic measures

118. The implementation of the basic measures will have a modest but nevertheless a positive impact on the status of water bodies. Wastewater treatment facilities in many agglomerations of the Lielupė RBD subject to the basic measures under the Urban Wastewater Treatment Directive have either been reconstructed or newly constructed, which means that the basic measures have already been implemented and hence no significant changes in pollution are expected as compared to the present situation. On the other hand, quality changes as a result of the implementation of the Urban Wastewater Treatment Directive have not been noticed yet in some rivers because the construction or reconstruction works have been completed just recently (i.e. in 2009).

The analyses findings show that 16 water bodies in the Lielupė RBD identified in the rivers Kulpė, Vijolė, Šiladis, Kruoja, Obelės, Vėzgė, Daugyvenė, Tatula, Nemunėlis, Laukupė, Beržtalis and Sidabra will still be suffering from a significant point pollution impact even after the implementation of the basic measures under the Urban Wastewater Treatment Directive. The volume of water in these rivers is low hence their pollution accumulation potential is low as well. These water bodies feel a significant impact of point pollution even when effluents have been properly treated. In addition to discharges from wastewater treatment facilities, the water bodies also receive untreated surface (stormwater) runoff and unaccounted wastewater of population who are not connected to the central sewerage collection systems. The rivers at risk due to point pollution impacts and parameters which serve as the basis for assigning rivers to water bodies at risk are provided in Table 40.

Table 40. Rivers at risk due to point pollution impacts in the Lielupė RBD ("1" indicates a significant impact)

Sub-basin	River or river stretch at risk	Parameter by which the rivers is identified as a water body at risk					Most significant pollution sources
		BOD_7	NH_4-N	NO_3-N	P_{total}	Hazardous substances	
Mūša	Kulpė	0	1	0	1	0	Šiauliai WWTP Surface runoff from Šiauliai city
Mūša	Vijolė	0	1	0	1	0	Surface runoff from Šiauliai city
Mūša	Šiladis	0	1	0	1	0	Kairiai WWTP
Mūša	Vėzgė	0	1	0	0	0	Aukštelkai WWTP K. Gražioniai WWTP Agricultural company Gražionių bekonas
Mūša	Daugyvenė	0	1	0	1	0	Šeduva WWTP Company Agrochemos mažmena
Mūša	Obelė	1	1	0	1	0	Radviliškis WWTP Pollution by non-sewered population
Mūša	Kruoja	0	0	0	1	0	Tributary Obelė Surface runoff from Pakruojis
Mūša	Tatula	0	1	0	1	0	Vabalninkas WWTP
Nemunėlis	Laukupė	1	1	0	1	0	Rokiškis WWTP Surface runoff from Rokiškis
Nemunėlis	Nemunėlis	1	0	0	1	0	~~Surface runoff from~~

Sub-basin	River or river stretch at risk	Parameter by which the rivers is identified as a water body at risk					Most significant pollution sources
		BOD_7	NH_4-N	NO_3-N	P_{total}	Hazardous substances	
							Rokiškis
							Intakas Laukupė
Lielupė Small Tributaries	Sidabra	0	1	0	1	0	Joniškio WWTP
							Pollution by non-sewered population
Lielupė Small Tributaries	Beržtalis	0	0	0	1	0	Žeimelis WWTP

Source: experts' analysis results

The implementation of the Nitrates Directive will result in improvement of the status of water bodies due to the construction of manure storages. At present, 28% of all LSU in the Lielupė RBD are held on farm with manure storages in place. After the implementation of the basic measures under the Nitrates Directive, this indicator is expected to go up to 54.5%.

It has been established that concentrations of nitrates will still be failing the good ecological status/potential requirements in 100 river water bodies within the Lielupė RBD even after the introduction of the basic measures under the Nitrates Directive. The achievement of good ecological status in these water bodies will require supplementary measures against diffuse agricultural pollution. It was estimated that diffuse nitrate nitrogen loads leached out into water bodies in the Lielupė Small Tributaries Sub-basin may have to be reduced by 8 kg/ha in order to achieve good ecological status/potential of rivers. The reduction required in the Mūša Sub-basin is a little lower – here pollution input in water bodies has to be reduced by around 4.4 kg/ha. The required reduction in the Nemunėlis Sub-basin is about 0.8 kg/ha.

The implementation of other directive discussed in this Programme of Measures will have a less significant effect on the status of water bodies because many of them are only indirectly related to the water status improvement.

CHAPTER III. SUPPLEMENTARY MEASURES

119. Supplementary measures have been proposed for the bodies of water which will be failing the good status requirements after the implementation of the basic measures, and their environmental and economic efficiency has been assessed.

Supplementary measures have been discussed and proposed for the following key areas:

119.1. for reducing the impact of point pollution;

119.2. for reducing the impact of agricultural pollution;

119.3. for mitigating and regulating hydromorphological changes;

119.4. for additional research and education.

SECTION I. DESCRIPTION OF SUPPLEMENTARY MEASURES

Measures to reduce point pollution

120. There are 16 water bodies in the Lielupė RBD identified as water bodies at risk due to an impact of point pollution which need supplementary measures in order to achieve good ecological status/potential. Such water bodies at risk were identified in the rivers Kulpė, Vijolė, Šiladis, Kruoja, Obelės, Vėzgė, Daugyvenė, Tatula, Nemunėlis, Laukupė, Beržtalis and Sidabra. The achievement of water protection objectives in all these water bodies is postponed either due to lack of funds for implementing the proposed water reduction measures by 2015 or shortage of data to be able to identify the pollution reduction demand

Estimations indicate that the Kulpė River may still be failing the requirements for good ecological status after the implementation of the basic measures under the Urban Wastewater Treatment Directive and despite the purification level in Šiauliai WWTP consequently achieved even much higher than required. Findings of the study "Preparation of a feasibility study on the construction of stormwater management systems in selected problematic settlements and development of recommendations for the construction of such systems in individual typical cases" demonstrated that the Kulpė River may be significantly affected by surface (stormwater) runoff. Since all possibilities to reduce pollution from Šiauliai WWTP have already been fully used, supplementary surface runoff management measures are recommended for improving the ecological status of the river, i.e. construction of surface runoff collection and treatment system in Šiauliai city.

A considerable share of surface (stormwater) runoff in Šiauliai city is discharged into the Vijolė River. Consequently, according to estimations, water quality problems can occur not only in the Kulpė but also in the Vijolė. Surface runoff management measures in Šiauliai city are expected to reduce pollution inputs both in the Kulpė and in the Vijolė. Following the feasibility study of surface runoff management, the investment demand totals to around LTL 33 million. It will not be possible to allocate such amount by 2015; besides, the project has not been developed technically, therefore the achievement of the water protection objectives in the rivers Kulpė and Vijolė should be postponed.

The reconstruction of Joniškis WWTP was completed in 2009 and was expected to ensure a high wastewater treatment level. However, the available data shows that this may not be sufficient in order to achieve good ecological potential of the Sidabra. The river also suffers from pollution from non-sewered population therefore visible pollution reduction can be expected only after the connection of a larger number of households to the wastewater treatment facilities. This is planned for the period 2011-2012. It is difficult to forecast pollution reduction as a result of the connection of more households to the wastewater treatment facilities because the present pollution loads of non-sewered population are not known. The Sidabra pollution problem may persist even after the connection of more households to the wastewater treatment facilities because of a significant input of surface (stormwater) runoff in addition to domestic wastewater. Consequently, a demand of supplementary measures will have to be assessed during the next planning period when data is available on the effect of the said connection. Hence it is proposed to postpone the achievement of the water protection objectives in the Sidabra River.

The quality of wastewater discharged from Radviliškis WWTP fully conforms to the requirements of the Urban Wastewater Treatment Directive. Nevertheless, this is not enough to achieve good ecological status in the Obelė River. The data of operational monitoring performed by the water company UAB Radviliškio vandenys indicates that high pollutant concentrations failing the good ecological status requirements are registered even upstream of the WWTP discharger. This shows that the river is polluted not only by effluents from the WWTP but also by non-sewered population. Due to this reason, supplementary measures to improve the performance of the WWTP would not be expedient and effective. The river status should be monitored until a larger number of households are connected to the wastewater treatment facilities and only then more significant pollution reduction can be expected. However, mathematical modelling results indicate that it might be complicated to achieve concentrations of total phosphorus in compliance with the good ecological status requirements in the Obelė River. Accordingly, mitigation of the water protection objectives may be required at the next planning stage. It is proposed to postpone the achievement of the water protection objectives for the water bodies in the Obelė River. Operational monitoring in the Obelė downstream of Radviliškis is recommended at this stage to be able to assess the pollution reduction after the connection of a larger number of households to the wastewater treatment facilities.

Findings of the study "Preparation of a feasibility study on the construction of stormwater management systems in selected problematic settlements and development of recommendations for the construction of such systems in individual typical cases" demonstrate that the ecological status of the Kruoja is affected not only by pollution transported from the river Obelė but also by surface (stormwater) runoff. Hence surface runoff management measures are proposed – construction of a runoff collection and treatment system in Pakruojis. Following the feasibility study on stormwater treatment, the demand of investments totals to around LTL 216 thousand. Such amount will not be available until 2015 and the project has not been prepared technically. Hence it is suggested postponing the achievement of water protection objectives in the Kruoja River.

Mathematical modelling results indicate that the Daugyvenė River may be failing the good ecological status requirements after the implementation of the basic measures under the Urban Wastewater Treatment Directive. However, such evaluation has not been based on measurements because no water quality measurements in the Daugyvenė downstream of Niauduva have been conducted during the recent years (the water company UAB Radviliškio vandenys has been performing measurements only in Niauduva downstream of the discharger of Šeduva WWTP). It is proposed to postpone the implementation of supplementary pollution reduction measures until more data on the ecological status of Daugyvenė is collected. Operational monitoring in the Daugyvenė is recommended in order to specify the ecological status of the river and identify the demand of supplementary measures.

Supplementary point pollution reduction measures may be required to achieve good ecological status of the rivers Laukupė and Nemunėlis. Since the estimations performed and information collected indicate that the drivers of pollution in the Laukupė and Nemunėlis include not only the loads from Rokiškis WWTP but also surface (stormwater) runoff and effluents of non-sewered population, supplementary measures should be designed for a more accurate identification of all potential pollution sources and a quantitative assessment of their loads. Priority should be given to the assessment

of surface runoff loads. Also, operational monitoring is proposed downstream of Rokiškis because actual measurements are missing to be able to accurately assess the ecological status of the Laukupė and Nemunėlis. It is proposed to postpone the achievement of the water protection objectives for the water bodies in the rivers Laukupė and Nemunėlis until further specification of their ecological status and collection of more data on pollution sources which exert a significant impact and on their pollution loads.

The Vėzgė River has been identified as a water body at risk due to point pollution impacts. The basic measures under the Urban Wastewater Treatment Directive will have no effect on the ecological status of this river because the main polluters are settlements with a p.e. of less than 2 000 (namely, villages Aukštelkai and Kalnelio Gražioniai) and the agricultural company ŽŪB Gražionių bekonas. High concentrations of NH_4-N were registered in effluents discharged from all these entities in 2009: the concentration of NH_4-N in effluents of ŽŪB Gražionių bekonas was 22 mgN/l, the one in effluents discharged from Aukštelkai WWTP – 31 mgN/l and from Kalnelio Gražioniai – 44 mgN/l. Mathematical modelling results indicate that the concentrations of NH_4-N in the Vėzgė under the present pollution loads may be as high as 0.7 mgN/l in years of a medium water volume, i.e. exceed the threshold of good ecological status more than three times.

Mathematical modelling results show that good ecological status in the Vėzgė will not be achieved if the present pollution loads of the wastewater treatment facilities of Aukštelkai and Kalnelio Gražioniai villages and ŽŪB Gražionių bekonas persist. A single water quality measurement conducted in 2006 also showed that concentrations of ammonium nitrogen or total phosphorus failing the good ecological status requirements may be present in the river. The concentration of NH_4-N in the Vėzgė at Mažaičiai measured on 7 June 2006 totalled to 0.42 mg/l (i.e. more than twice exceeded the threshold of good ecological status) and the concentration of P_{total} was 0.24 mg/l (i.e. 1.7 times exceeded the good ecological status requirements). The Vėzgė has been identified as a water body at risk due to point pollution impacts and hence supplementary point pollution reduction measures may be required to achieve good ecological status therein.

Estimations conducted following mathematical modelling results demonstrated that the aggregate pollution load of ammonium nitrogen discharged into the Vėzgė from the three dischargers should not exceed 130 kg/year to be able to reduce the concentrations of ammonium nitrogen to the required level. The demand of the reduction of total phosphorus is not clear enough yet because modelling results show that the concentrations of P_{total} in the river under the present pollution loads should be failing the good ecological status requirements only in dry years meanwhile in years of a medium water volume in the river the concentration of total phosphorus should not be exceeding the threshold of good ecological status. To be able to specify the demand of supplementary measures for reducing pollution with total phosphorus, the river water quality should be monitored downstream of the dischargers. With a view to achieve a maximum effect, the implementation of supplementary measures for reducing pollution with ammonium nitrogen is proposed to be postponed for some time until the establishment of a demand to reduce phosphorus pollution loads. Operational monitoring in the Vėzgė is recommended in order to specify the demand of supplementary measures for reducing pollution with phosphorus.

The Beržtalis River has been identified as a water body at risk due to a significant load of total phosphorus. Mathematical modelling results show that the recently (in 2009) increased pollution with ammonium nitrogen by the main polluter, Žeimelis WWTP, has posed a risk of failing the good ecological status requirements by this pollutant as well. The situation is not expected to change in the nearest future because the settlement is not subject to the requirements under the Urban Wastewater Treatment Directive so no pollution reduction measures will be implemented. To be able to achieve good ecological status in the Beržtalis River, supplementary point pollution reduction measures may be required. Before that, however, water quality analysis in the river downstream of Žeimelis town has to be conducted because the present evaluation of risk has been based only on the modelling results which can contain certain errors. Hence, it is proposed to postpone the achievement of the water protection objectives in the Beržtalis and to perform operational monitoring in order to specify the demand of supplementary pollution reduction measures. After the analysis and specification of the ecological river status, supplementary point pollution reduction measures, if such are required, will have to be established during the next planning stage.

Estimations show that the rivers Šiladis and Tatula may be failing the good ecological status requirements due to significant point pollution impacts. The Šiladis may be suffering from pollution loads from Kairiai WWTP and the Tatula – from the ones discharged from Vabalninkas WWTP. A significant impact of these pollution sources was identified by way of calculations hence actual data validating the impact is required in order to have a basis for introducing supplementary measures because calculation results can contain errors. Consequently, it is proposed to postpone the implementation of supplementary measures in Kairiai and Vabalninkas wastewater treatment facilities. Operational monitoring sites have been envisaged for the monitoring of the river status downstream of these dischargers. After the analysis and specification of the ecological river status, supplementary point pollution reduction measures, if such are required, will have to be established during the next planning stage.

It should be noted that though no negative impact by small settlements of less than 500 p.e. on water bodies was indicated by the simulation results, investigative monitoring of effluents will nevertheless be performed in a few settlements (Rozalimas and Mikoliškis) which are suspected to be exerting an impact. The results of the investigative monitoring will enable establishing whether the volumes of wastewater discharged from the settlements of less than 500 p.e. could potentially have an impact on water bodies.

Measures to reduce diffuse pollution

121. Water bodies in part of the Lielupė RBD will be failing good water status after the implementation of the basic measures due to diffuse pollution from agriculture. This problem is most acute in the Lielupė Small Tributaries and Mūša sub-basins. The areas where supplementary diffuse pollution reduction measures are required are demonstrated in Figure 1.

122. Supplementary measures for reducing diffuse pollution from agriculture have been chosen on the basis of foreign experience in addressing diffuse pollution problems and scientific research conducted in Lithuania and abroad, as well as with reference to statistical data. One of the most important criteria for the selection of supplementary measures for reducing diffuse agricultural pollution is the effectiveness of agricultural measures. The indicator is calculated by dividing annualised costs by the effect of the

measure. The indicator is expressed in litas per kilogram of pollutants, i.e. it shows how much it would cost to remove one kilogram of nitrogen from a water body with the help of a certain measure. The effectiveness of measures is estimated on the basis of scientific research conducted in Lithuania and abroad. The cost estimation method depends on the measure in question and the available data.

The final list of the proposed measures was drawn up taking into account practical possibilities to implement a measure in question in a certain place and to the required extent, institutional capacities, agreement with the polluter pays principle, affordability to the population, financing possibilities, acceptability of the measures to farmers and representatives of managing institutions in the agricultural sector.

123. A number of diffuse pollution reduction measures are proposed for the entire country. Most of them have already been approved in the Programme of Measures for Achieving Water Protection Objectives within the Nemunas River Basin District, which was adopted by Resolution No. 1098 of the Government of the Republic of Lithuania of 21 July 2010 (Žin., 2010, No. 90-4756).

124. It is also recommended to amend the Environmental Requirements for Manure and Slurry Management introducing the obligation for farms with 50 and more LSU to keep documents proving legal use, transfer or sale of manure and/or slurry for at least two years.

125. After the implementation of the measures provided for in this Programme of Measures, 9 catchments or 27 water bodies will still be facing pollution problems. Here pollution has to be reduced by 223 tonnes of total nitrogen. Most of the areas with significant pollution have similar characteristics, such as low flow, prevailing fertile mixed and clayey land. Higher pollutant concentrations are often registered in small water bodies where utilised land occupies the major part of the catchment. As a result, most of the diffuse pollution reduction measures are little cost-effective. Detailed descriptions of the measures are provided below.

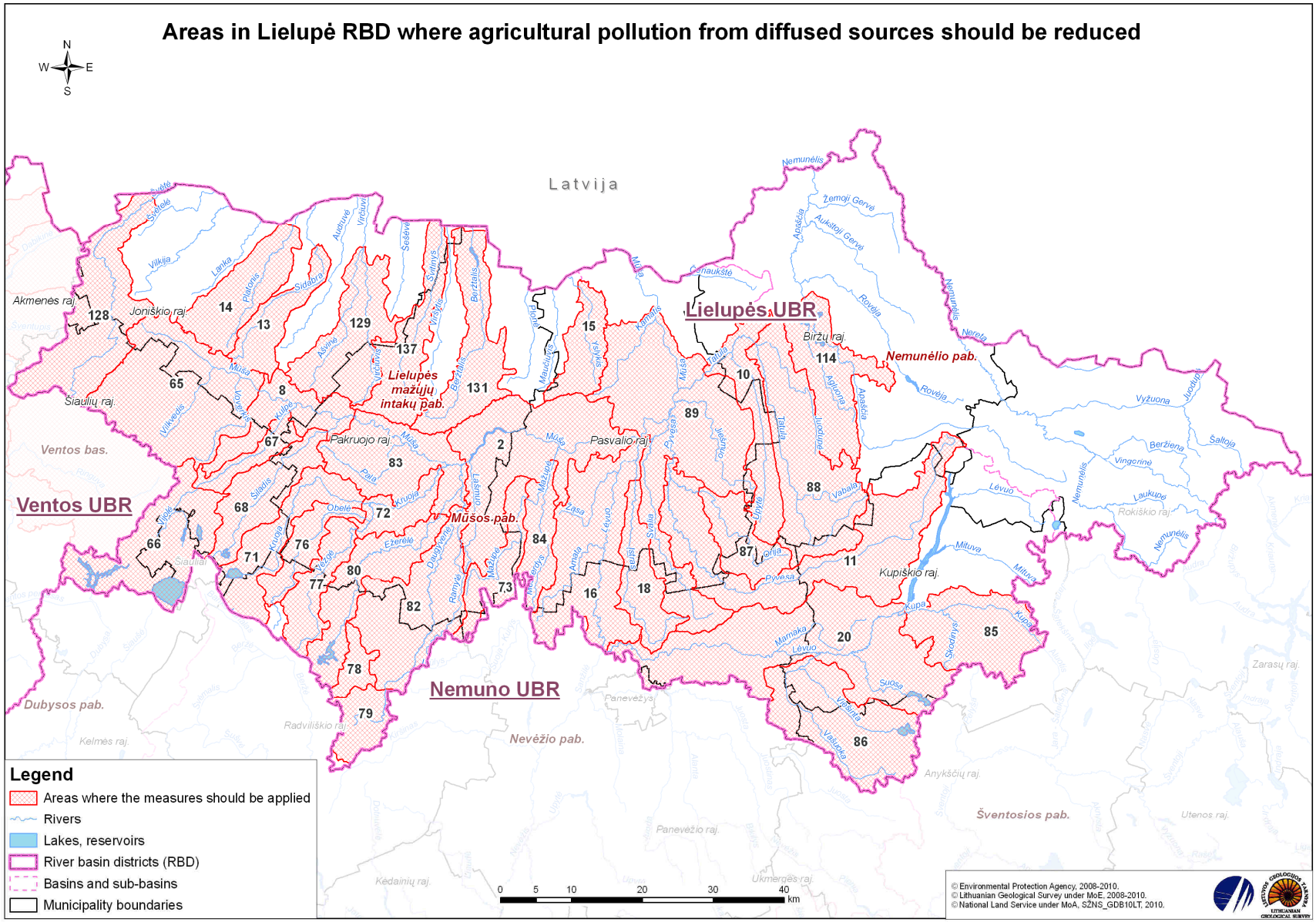

Figure 1. Areas in the Lielupė RBD where diffuse agricultural pollution has to be reduced

Diffuse pollution reduction measures common for the whole of Lithuania

126. Diffuse agricultural pollution pressures should be first of all subject to measures which help introducing the polluter pays principle common in many EU Member States. Such measures are proposed for the entire country independently of the intensity of agricultural activities because these measures also play a preventive role. They would also become a reference point for the application of other measures indicating the amount and type of substances entering the soil. The below-listed are measures recommended for the whole of Lithuania.

127. Drafting and enactment of normative standards comprising a legal and methodical basis for the development of fertilisation plans covering:

127.1. maximum allowable amounts of nitrogen and phosphorus fertilisers per hectare, irrespective of whether organic or mineral fertilisers are used;

127.2. general fertilisation recommendations;

127.3. a methodology for estimating the economically optimal amount of fertilisers.

The methodology should define fertiliser norms by plant species, taking into account nutrient needs for standard crop yield, give formulas enabling to calculate fertiliser needs depending on the soil physical and agrochemical properties established by the analysis of the soil in a particular field, as well as the correction coefficient for the absorption of substances from different fertilisers.

Similar normative standards have already been prepared by scientists of the Lithuanian Institute of Agriculture. They have established the standard productivity of 12 plant species and nutrient needs for standard crop yield, as well as correction coefficients on the basis of soil physical and agrochemical properties. It is recommended to review and enact these normative standards.

One of the proposed substantial changes is to increase the coefficient of nitrogen absorption from manure. The current coefficient of 0.45 does not reflect the process of nitrogen accumulation in the soil in the long run. It is proposed to increase this coefficient to 0.65. In practice, this would mean reduced fertilisation norms for farmers. The major impact of the measure would be felt on the farms where organic fertilisers make up a considerable share of fertilisers. It is important that the coefficient is changed in parallel with training courses for farmers intended to help them to introduce methods allowing the maximum utilisation of substances accumulated in the soil. Transition to more advanced farming methods is expected to help avoid losses that could result from inefficient farming practices when plants are not allowed to take up substances from the soil.

Normative standards and related documents should be revised and enacted by 2012. The responsibility for the implementation of the measure should lie with the Ministry of Agriculture of the Republic of Lithuania.

128. Mandatory development and implementation of fertilisation plans for farms utilising ten and more hectares of land

Enactment of normative standards as such would not have any direct impact on the reduction of diffuse pollution. The effect of the measure would be visible when

preparing and implementing fertilisation plans which, in their turn, would not only ensure balanced fertilisation but would also become a reference point for the application of many other measures related to fertilisation norms. Information would be obtained on the amount and type of substances entering the soil – at least in the area which belongs to farms fertilising ten or more hectares of utilised agricultural land. Such farms in the Lielupė RBD comprise 88% of the utilised agricultural land. The introduction of the measure in smaller farms would be complication due to its acceptability and relatively high costs meanwhile its application only in large farms would facilitate control of only a small area of land (and a respective amount of fertilisers therein).

Following observations and estimations, it can be stated that the major problem in Lithuania arises from unbalanced fertilisation rather than over-fertilisation. Some areas are not fertilised at all, whereas in other locations, based on the experience of the Agri-Information and Rural Business Centre, the spread of fertilisers is much too high. Farmers mostly use nitrogen fertilisers seeking to increase productive capacity without considering amounts of other elements and their interaction. In the event of a lack or surplus of a certain element, the absorption of other elements is obstructed, i.e. plants cannot take them from the soil. Therefore, the preparation of a fertilisation plan requires knowing nutrient stocks in the soil in a particular field. Analyses of the amounts of the main substances should be a must every spring, while soil acidity, humus percentage, phosphorus and potassium contents, which are less variable, could be tested every five years. The application of optimal fertilisation norms calculated in accordance with the approved norms and methodology would help to balance the ratio of nutrients (N, P, K), i.e. the amount of fertilisers used would be the minimum amount needed by plants, without leaving surplus nutrients in the soil which usually leach into deeper soil layers.

Since the major problem in Lithuania is local rather than general over-fertilisation, the effect of the measures – application of fertilisation norms and mandatory development of fertilisation plans – would be local as well. Estimations of this impact were based on the assumption that half of an area is over-fertilised and the other half is insufficiently fertilised. If over-fertilisation accounts for about 10%, the amount of fertilisers will total to 10 kg/ha in the over-fertilised zones, or 5 kg/ha in the total area (following the said assumption that half of a field is over-fertilised and the other half is insufficiently fertilised). Taking into account that about half of this amount is leached out (according to rough estimates), the effect of the introduction of the norm in the root zone will be 2.5 kg/ha.

Though the strongest effects of fertilisation plans would be observed in intensive agricultural areas, the requirement to introduce such plans only in the said areas might be regarded as breach of competition terms. Hence it is proposed to develop and implement fertilisation plans all around Lithuania. Besides, the application of the measure in areas where pollution from agriculture has less impact on water quality would serve as a pollution prevention measure.

The costs of the implementation of fertilisation plans would be borne by farmers. According to the existing rates based on the data of the Agricultural Advisory Service, the average costs of a fertilisation plan (including sampling) is LTL 100 per field. The number of fields is very different on farms, though an average farm statistically has five fields (this number was derived from the data of farms using the services of the Agricultural Advisory Service). Hence, the average estimated price for the development

of a fertilisation plan for a farm was equalled to LTL 500, which makes up 0.3-1.3% of the profit of farms ranging from 10 ha to 150 ha, including subsidies.

The responsibility for the implementation of the measure – drafting and enactment of relevant legislation by 2012 would lie with the Ministry of Agriculture of the Republic of Lithuania, meanwhile farmers would be responsible for the introduction of the measure – development of fertilisation plans and adherence thereto as from 2012.

The likelihood that the measure will be implemented is deemed to medium because of potentially low acceptability of the measure to farmers, though an affordability analysis demonstrated that the costs required are not disproportionately high as compared to the average expenditure and profit of farms. However, this likelihood can be increased by informing farmers about the economic and environmental benefits of the fertilisation plans.

129. At present, fertilisation plans can be developed by any person having agricultural education, therefore more stringent requirements should be set for natural and legal persons developing fertilisation plans.

130. Mandatory observance of manure and slurry management recommendations set forth in the Good Farming Rules and Guidelines by farms with less than 10 LSU

It is proposed to enact the requirement for all Lithuanian farms with less than 10 LSU (i.e. farms which are not subject to the requirements of the Nitrates Directive) to manage manure and slurry in line with the recommendations set forth in the Good Farming Rules and Guidelines and in compliance with the Environmental Requirements for Manure Management. The Good Farming Rules provide for that solid manure may be temporarily stored in field heaps in accordance with the following recommendations:

130.1. temporary manure storage sites must be installed in higher locations to avoid any risk of getting flooded or waterlogged by rain;

130.2. the storage site must be confined with a 50 cm embankment;

130.3. prior to starting stockpiling manure, the storage site must be covered with a 5 cm thick layer of dry peat substrate or a 70 cm thick layer of chopped straw or leaves to absorb manure runoffs;

130.4. the stockpiled manure must be covered with a plastic sheet or a 20 cm mixed layer of peat and chopped straw.

The costs of the installation and maintenance of such manure field heaps for a farmer would be minimal. The required resources include small quantities of straw and peat and a period of working time of a farmer necessary for installation. It is assumed that maintenance would cost about LTL 10 per livestock unit a year (peat, time for maintenance). Such costs should be acceptable to small farms. For example, the average costs on a farm with nine hectares of land and five LSU would make up 0.4% of the gross profit of the farm, including subsidies.

Following estimations carried out in Denmark, the effect of the measures on one LSU is assumed to be around 4 kg in the root zone (1/25 from the nitrogen amount generated by one LSU).

The responsibility for the implementation of the measure – drafting and enactment of relevant legislation, i.e. enactment of Good Farming Rules as mandatory instead of recommended (by 2011) would lie with the Ministry of Environment and the Ministry of Agriculture of the Republic of Lithuania, meanwhile farmers would be responsible for the introduction of the measure as from 2012.

Diffuse pollution reduction measures applicable in identified areas

131. These measures are not mandatory for the entire country. It is proposed that such measures are optional and their costs are compensated thus ensuring equal farming conditions for all farmers. It is very important that the support schemes are prepared/amended in a way enabling to implement the measures in due places and to the required extent. One of the most important criteria for the screening of measures is the indicator of effectiveness (the ratio of the effect to the costs), hence first of all the implementation of measures which have already been granted funding should be promoted. At present, measures which facilitate the implementation of the water protection objectives in the sector of agriculture are supported by the Rural Development Programme (RDP) for 2007-2013. It is proposed to amend certain support schemes or allowance amounts under this Programme as well as to develop new schemes and to allocate addition funds for these schemes.

132. Amendment of the existing support schemes under the RDP

At present, support under the RDP for 2007-2013 is granted for various activities which contribute to the reduction of excessive nitrogen amounts in water bodies. It is recommended to amend the rules for the support schemes under Axes I and II of the RDP for 2007-2013, without allocating additional funds or introducing major changes, so that activities which can reduce the input of nitrogen and other nutrients into water bodies are encouraged to the maximum extent in the identified areas (Figure 2), i.e. in places where nitrogen concentrations in water bodies, as a result of agricultural activities, remain too high even after the application of common measures.

In the case of budget restrictions, a general recommendation for all the below-listed support areas is to give priority to the economic entities located in the identified areas (Figure 2) thus ensuring that funds are directed first of all to areas where they can be used for the achievement of the water protection objectives to the maximum extent. The recommendation is applicable to the following support areas (activities) under the Lithuanian Rural Development Programme for 2007–2013:

132.1. projects aiming at the implementation of the Nitrates Directive under Axis I, Measure 6 “Modernisation of agricultural holdings“, Activity 1 “Compliance with the requirements of the Nitrates Directive and the new compulsory Community standards”;

132.2. activities supported under the Landscape Stewardship Scheme (Axis II, Measure 1 “Agri-environment payments”): management of natural and semi-natural meadows; management of wetlands; management of shore protective belts of water bodies in meadows; protection of water bodies against pollution and soil erosion on arable land; stubbly fields in winter season; strips or plots of woody plants in arable land; management of reclamation ditches;

132.3. activities supported under the Organic Farming Scheme (Axis II, Measure 1 “Agri-environment payments”). Though the application of this measure does not reduce

nitrogen surplus, it is nevertheless appropriate for the protection of surface water and groundwater against pesticides.

132.4. activities supported under the Scheme for Improving the Status of Water Bodies at Risk (Axis II, Measure 1 "Agri-environment payments") – conversion of arable land to perennial pastures (grassland). In addition to the key recommendations, it is proposed to establish the following in respect of projects which implement the activities under the Scheme for Improving the Status of Water Bodies at Risk in the identified areas (Figure 2):

132.4.1. a compensatory allowance shall not be lower than the profit of the farm from regular activities and the amount of the allowance shall depend on the soil fertility score[21].

132.4.2. financing priority shall be given to projects implemented in sandy soils.

Conversion of utilised land into grassland is an effective measure for removing nitrogen and phosphorus. Its effect depends on the type of soil – it is more effective in sandy soils (56-66 kg/ha) than in other types of soils (26-36 kg/ha). Indicators of the effect were estimated taking into account the fact that leaching from the root zone after two and more years of the growing of energy crops becomes equal to the natural one.

132.5. Axis I, Measure 6 "Modernisation of agricultural holdings", Activity 3 "Planting of short-rotation coppices". Perennial energy crops, such as willows or osiers, can be grown in place of conventional agricultural crops in any type of farms; however, from the environmental point of view energy crops are best grown in wet areas with particularly high nitrogen concentrations, e.g. swampy areas near large farm holdings.

Perennial energy crops have a permanent deep rooting system which significantly limits nitrate leaching. In addition, these crops require large amounts of nitrogen for their growth which they can take up from the soil.

In addition to the key recommendations, it is also proposed to provide for an obligation for plant growers to develop and adhere to fertilisation plans.

The average amount of allowances would be around LTL 600. At present, farmers practically do not implement any projects of this kind and do not use the support scheme (according to data of the Ministry of Agriculture). This could be due to the compensation amount (LTL 407 per hectare) which is lower than the lost profit from the regular activities (around LTL 510)[22], especially in fertile soil where diffuse pollution is most significant.

[21] The average amount of allowances was used for the calculations – LTL 600 per hectare. This is a little more than the average profit of farms from one hectare (LTL 510). The present amount is LTL 407 per hectare. However, such amount is not attractive to farmers, especially in fertile soils. In cases when farmers received the major share of profit from their regular activities in the form of subsidies, such subsidies should be redistributed. However, it is assumed that the state would not bear any related costs.

[22] The average of 2007 and 2008, respondent companies' data, Lithuanian Institute of Agrarian Economics

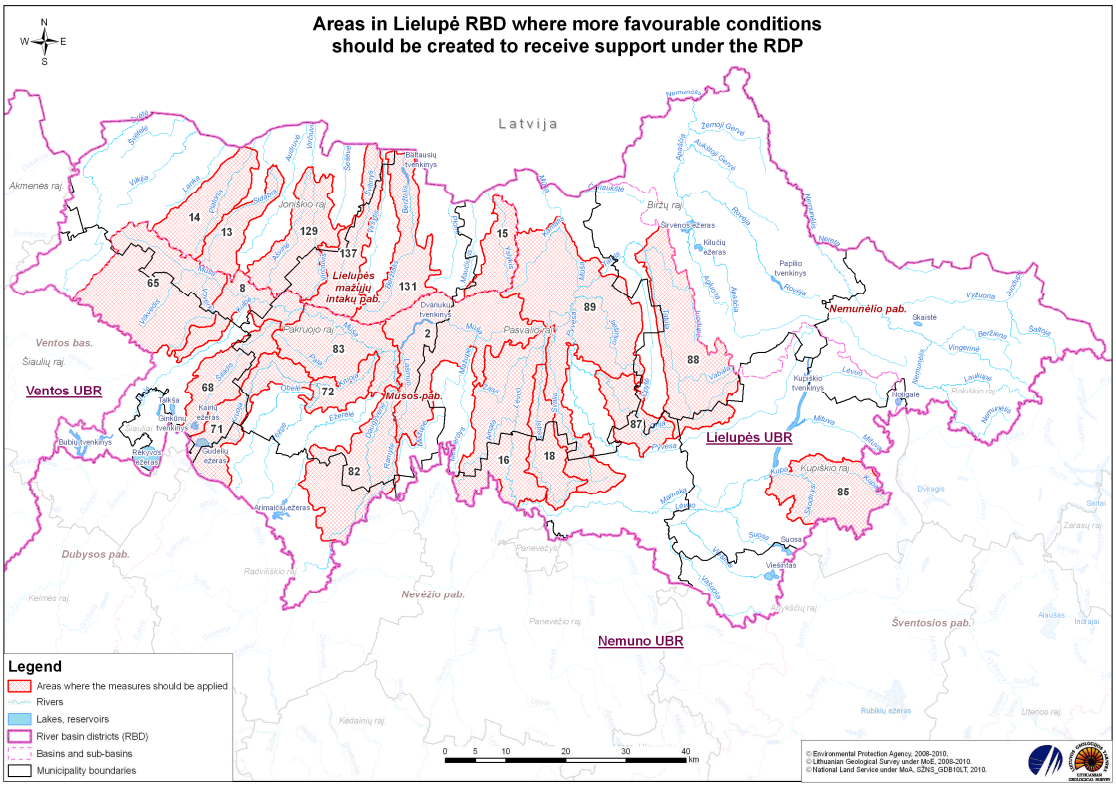

Figure 2. Areas in the Lielupė RBD where more favourable conditions should be created to receive support provided under the RDP

132.6. Though the principle of reducing the amount of nitrates in water bodies which stands behind the activities which should be promoted with the help of the said amendments is different, all of them contribute to the reduction of diffuse pollution. Since it is difficult to forecast exactly what measures under the RDP are going to be implemented in specific areas and as the effect of the measures differs depending not only on the measure in question but also on the place where that measure is implemented, it is assumed that the amendment of the rules of the support schemes under the RDP for 2007-2013 would result in the reduction of pollution with nitrogen by 0.25 kg/ha in additionally identified areas.

133. It is proposed to prepare new compensatory schemes under the RDP and apply them in areas where agricultural pollution persists even after the application of the measures common for the whole of Lithuania (Figures 3 and 4).

133.1. Application of a fertilisation norm lower than the optimal one by 20%

The application of a fertilisation norm lower than the optimal one would significantly reduce nitrogen leaching because a large amount of nutrients leach into water instead of being absorbed by plants when fertilisers are applied in amounts close to the maximum norm. For example, when 100 kg of fertilisers per hectare[23] are reduced by 20%, every kilogram would reduce the amount of leached nutrients from 0.6 kg to 1 kg. Consequently, the total leaching would go down by 6-10 kg/1 ha. The application of a fertilisation norm lower than the optimal one is recommended for the areas demonstrated in Figure 3.

[23] Rough estimate of average fertilisation in Lithuania on the basis of the amount of crops grown.

It is proposed to develop and introduce a new support scheme for the areas demonstrated in Figure 3 and intended for farmers who undertake to apply a fertilisation norm lower than the optimal one. Farmers wishing to make use of this support scheme should decide on this already at the stage of the development of a fertilisation plan and thus calculate the maximum amount of fertilisers allowed on his farm (20% lower than the optimal one) following the approved methodology for the development of fertilisation plans.

Farms subject to lower fertilisation norms would sustain losses due to lower crop yields or lower nutrient value of plants. Losses would be most significant on farms where the use of fertilisers is already close to the maximum limit. The compensation offered should cover the losses and farmers would also be able to save additionally by buying less fertilisers. Potential losses would be established at the fertilisation plan development stage. The compensation amount would be set taking into account the losses and relevant production prices.

The methodology for the development of fertilisation plans used by the Lithuanian Agricultural Advisory Service contains an example of a farm which grows summer barley. Should this farm applies a fertilisation norm 20% lower than the economically optimal one, the harvest lost would total to 100 kg. Using the price calculated for the establishment of the economically optimal norm, such amount would cost LTL 35. At present, prices are a little higher so the losses are likely to be somewhat higher as well.

Though a specific compensation amount would be calculated when developing a fertilisation plan for a given farm, the amount used for estimations is LTL 50 per hectare. This figure was calculated taking into account potential harvest losses during the application of the measures.

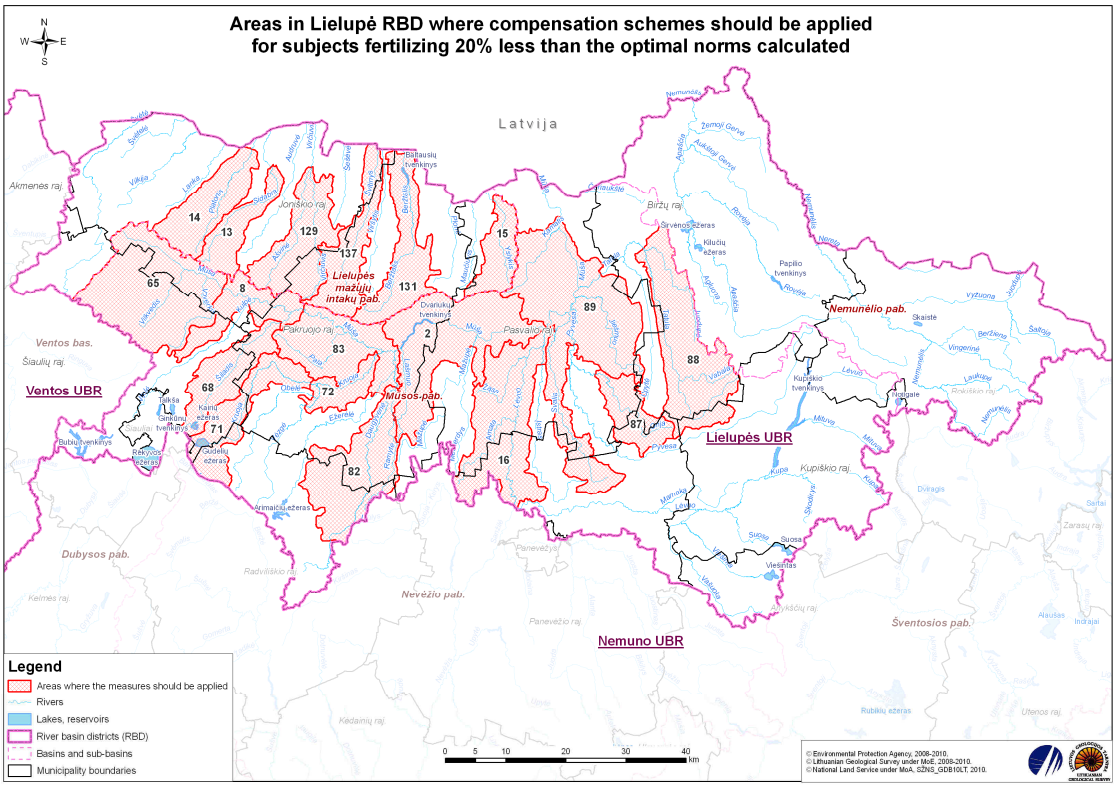

Figure 3. Areas in the Lielupė RBD where farmers should be encouraged to apply fertilisation norms 20% lower than the economically optimal ones

133.2. Growing of catch crops in sandy and mixed soil

Catch crops are crops that are grown after the harvest or undersown before the harvest of one crop until the planting of another crop – approximately from August to early spring. Such crops reduce the leaching of nutrients by taking up nitrogen from the soil and accumulating it in their biomass. Among the most effective plants in this respect are deep rooting plants, such as oil radish. They lift nutrients up from the deeper layers of soil, melt phosphorus contained in hardly accessible compounds in soil, and help plants to assimilate potassium. Less effective are such plants as birds-foot trefoil, phacelia, white mustard, lupine, Italian ryegrass, buckwheat, and peas (source: Lithuanian Agricultural Advisory Service, LAAS).

Catch crops are beneficial for agriculture as they keep nutrients in the soil arable layer, part of which is available for uptake by other plants. E.g. mustard is able to hold up to 70 kg N/ha, 15-25% of which may be later taken up by other plants. Also, catch crops help to sustain the balance of soil organic matter, improve physical properties of soil, and contain the spread of weeds.

The measure is particularly effective in areas where nutrients are not retained by natural processes. The strongest effects are observed in sandy soils and areas with high precipitation rates. The effects of the measure in reducing the leaching have been assessed on the basis of calculations made in Denmark. It has been estimated that in clayey soils under low precipitation the leaching from the root zone is reduced by 12 kg/ha, while in sandy soils under higher precipitation – by 37 kg/ha. Reduced leaching is observed in the first year already.

Assumptions are made that the annual costs of the measure for a farmer are about LTL 300 per ha (i.e. seeds and sowing). Also, the above-mentioned effect when catch crops retain some nitrogen in the soil thus substituting fertilisers would be of additional value. The proposed compensatory allowance is LTL 350 per one hectare of land sown with catch crops. As the measure is optional, it is practically impossible to ensure that it will be introduced in the required areas and to the needed extent. Hence, additional 10% is added to the estimated costs of the measure in order to compensate for the error (in respect of place and scope) of the implementation of the measure.

Taking into account the ratio between the effect and the costs, it is proposed that funds for the said compensatory schemes are allocated only for the growing of catch crops in sandy and mixed soil (Figure 4, Table 41).

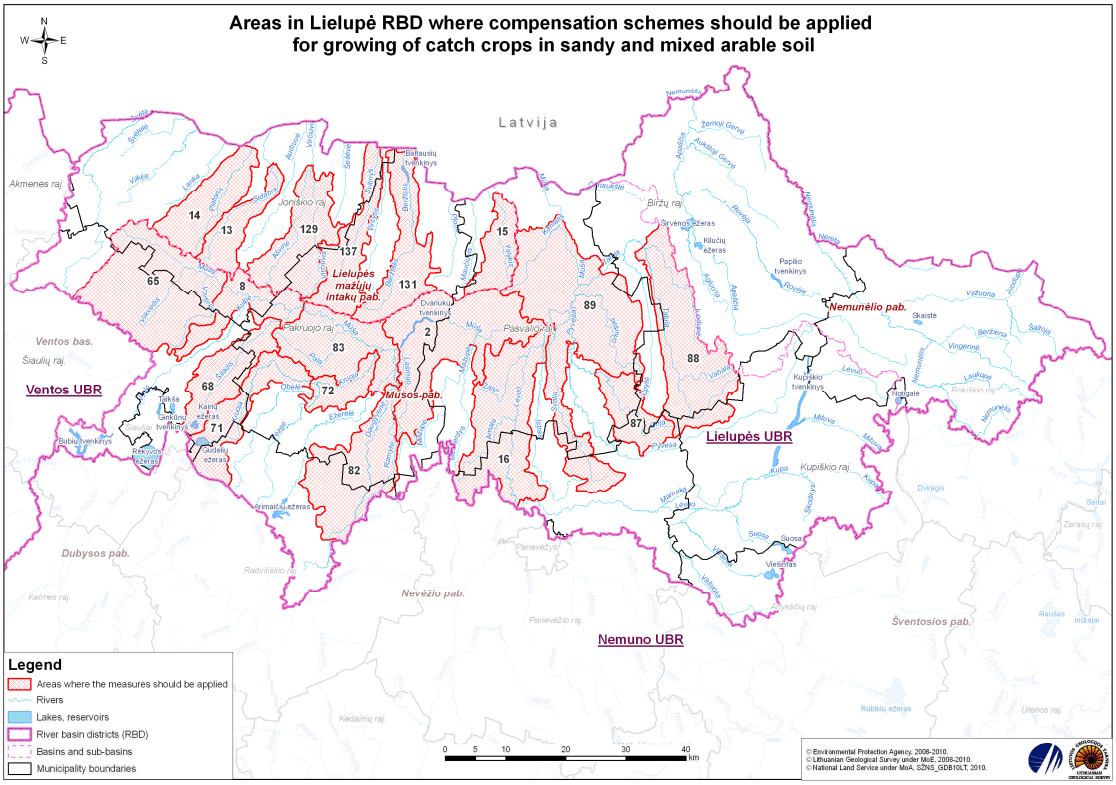

Figure 4. Areas in the Lielupė RBD where the growing of catch crops should be encouraged

Table 41. Wards where new compensatory schemes are proposed

Areas where compensatory schemes are recommended for farmers who apply fertilisation norms 20% lower than the optimal ones and/or grow catch crops	Areas in Lielupė RBD where more favourable conditions to use support schemes under RDP are recommended
Alizava ward, Kupiškis distr. munic.	Alizava ward, Kupiškis distr. munic.
Daujėnai ward, Pasvalys distr. munic.	Daujėnai ward, Pasvalys distr. munic.
Gataučiai ward, Joniškis distr. munic.	Gataučiai ward, Joniškis distr. munic.
Gruzdžiai ward, Šiauliai distr. munic.	Gruzdžiai ward, Šiauliai distr. munic.
Guostagalis ward, Pakruojis distr. munic.	Guostagalis ward, Pakruojis distr. munic.
Joniškis ward, Joniškis distr. munic.	Joniškis ward, Joniškis distr. munic.
Kairiai ward, Šiauliai distr. munic.	Kairiai ward, Šiauliai distr. munic.
Karsakiškis ward, Panevėžys distr. munic.	Karsakiškis ward, Panevėžys distr. munic.
Kepaliai ward, Joniškis distr. munic.	Kepaliai ward, Joniškis distr. munic.
Klovainiai ward, Pakruojis distr. munic.	Klovainiai ward, Pakruojis distr. munic.
Krinčinas ward, Pasvalys distr. munic.	Krinčinas ward, Pasvalys distr. munic.
Kriukai ward, Joniškis distr. munic.	Kriukai ward, Joniškis distr. munic.
Kupiškis ward, Kupiškis distr. munic.	Kupiškis ward, Kupiškis distr. munic.
Linkuva ward, Pakruojis distr. munic.	Linkuva ward, Pakruojis distr. munic.
Lygumos ward, Pakruojis distr. munic.	Lygumos ward, Pakruojis distr. munic.
Meškuičiai ward, Šiauliai distr. munic.	Meškuičiai ward, Šiauliai distr. munic.
Namišiai ward, Pasvalys distr. munic.	Namišiai ward, Pasvalys distr. munic.
Pakalniškiai parish ward, Radviliškis distr. munic.	Pakalniškiai parish ward, Radviliškis distr. munic.
Pakruojis ward, Pakruojis distr. munic.	Pakruojis ward, Pakruojis distr. munic.
Panevėžys ward, Panevėžys distr. munic.	Panevėžys ward, Panevėžys distr. munic.
Pasvalys ward, Pasvalys distr. munic.	Pasvalys ward, Pasvalys distr. munic.
Pašvitinis ward, Pakruojis distr. munic.	Pašvitinis ward, Pakruojis distr. munic.
Pumpėnai ward, Pasvalys distr. munic.	Pumpėnai ward, Pasvalys distr. munic.
Pušalotas ward, Pasvalys distr. munic.	Pušalotas ward, Pasvalys distr. munic.
Radviliškis parish ward, Radviliškis distr. munic.	Radviliškis parish ward, Radviliškis distr. munic.
Rozalimas ward, Pakruojis distr. munic.	Rozalimas ward, Pakruojis distr. munic.
Rūdiškės ward, Joniškis distr. munic.	Rūdiškės ward, Joniškis distr. munic.
Saločiai ward, Pasvalys distr. munic.	Saločiai ward, Pasvalys distr. munic.
Satkūnai ward, Joniškis distr. munic.	Satkūnai ward, Joniškis distr. munic.
Saugėlaukis ward, Joniškis distr. munic.	Saugėlaukis ward, Joniškis distr. munic.
Širvėna ward, Biržai distr. munic.	Šimoniai ward, Kupiškis distr. munic.
Skaistgiris ward, Joniškis distr. munic.	Širvėna ward, Biržai distr. munic.
Vabalninkas ward, Biržai distr. munic.	Skaistgiris ward, Joniškis distr. munic.
Vaškai ward, Pasvalys distr. munic.	Skapiškis ward, Kupiškis distr. munic.
Žeimelis ward, Pakruojis distr. munic.	Vabalninkas ward, Biržai distr. munic.
	Vaškai ward, Pasvalys distr. munic.
	Žeimelis ward, Pakruojis distr. munic.

Source: experts' distribution

Supportive measures to reduce diffuse pollution

134. Supportive measures usually do not produce any direct effects themselves, but they are very important in implementing other measures. Their introduction is proposed throughout Lithuania, focusing on areas affected by significant diffuse pollution from agriculture.

134.1. Education and information of farmers and implementing institutions

Educational measures are usually very effective, but their effect is hard to be measured directly, particularly because this effect is evidenced indirectly and only after a while. The main areas of information and training are as follows:

134.1.1. information campaigns for farmers throughout Lithuania on the maximum allowed fertilisation norms, procedure of the development of fertilisation plans and benefits of the plans;

134.1.2. information campaigns for farmers in the Lielupė RBD on compensatory schemes under the RDP for the application of lower fertilisation norms and for the growing of catch crops in sandy and clayey soils, as well as on benefits of these measures, together with trainings on efficient farming methods allowing to utilise nutrients accumulated in the soil to the maximum extent;

134.1.3. information campaigns and trainings for small farmers throughout Lithuania on the management of manure and slurry;

134.1.4. trainings for developers of fertilisation plans throughout Lithuania.

134.2. Additional control of farms

Control is one of the key mechanisms helping to ensure the implementation of measures. However, a number of gaps have been observed, which is mainly due to a lack of human and financial resources. While exercising control over both the measures currently being implemented and the ones recommended, the reallocation of resources is proposed in a way ensuring adequate control at least in the areas which suffer from significant agricultural pollution.

The most effective measures for reducing the amounts of nutrients in water bodies are supposed to have been introduced in Lithuania by now. These include manure storages in large farms, restrictions on animal density and on the use of organic fertilisers, fertilisation plans on large farms, protection zones and belts of water bodies, and other measures. An important thing in addition to the education and other kinds of encouragement to introduce point pollution reduction measures is to increase control. The implementation of the basic measures is especially important in areas suffering from significant agricultural pollution. If control is not exercised and the basic measures are not implemented, supplementary measures will not be sufficient to reduce agricultural pollution to the desired level and so good water status will not be achieved. Since the state is already supposed to be implementing the said measures, no additional funds for control and related activities have been provided for in the present Programme of Measures.

While implementing supplementary measures, it is recommended to conduct additional checks on 5% of all small farms in Lithuania having up to 10 LSU; 10% of farms utilising 10 ha agricultural land and more in areas where supplementary measures are required to reduce diffuse pollution from agriculture; and 2% of farms of the same size in the remaining territory of Lithuania.

It is assumed that a check on a large farm will cost LTL 200 on average and on a small one – LTL 49[24]. Checks on large farms take more time; they may cover not only fertilisation plans but also the implementation of other measures and related requirements (such as contracts on manure transference or sale). Moreover, larger farms are usually located at a considerable distance from each other. Checks carried out on small farms cost less because they usually concern just the storage of manure and slurry and thus are less time-consuming, as well as farms are closer to each other.

[24] The estimation methodology is provided in the Technical Report (Part VI of the Activity Results).

The responsibility for the implementation of this measure would rest with relevant competent institutions exercising control over agricultural activities. It is suggested to start exercising control as from 2012.

134.3. Additional accountability of farms

The major problem at the moment is local rather than general over-fertilisation in districts of intensive agriculture, therefore it is important to establish the amounts of fertilisers used and specific fertiliser application places. Currently, only a small number of farms are obligated to have documents on the use of fertilisers. It is recommended to amend the Environmental Requirements for Manure and Slurry Management approved by Order No. 367/3D-342 of the Minister of Environment and the Minister of Agriculture of the Republic of Lithuania of 14 July 2005 introducing a requirement for farms with 50 and more LSU to keep documents proving legal use, transfer or sale of manure and/or slurry for at least two years.

Table 42. Summary of assumptions underlying the proposed measures [25]

Measure	Mandatory everywhere/ Optional in identified areas	Reimbursable /non-reimbursable	Operating costs, unit/LTL/year [26]	Effect of a unit, N kg[27]	Source of financing	Effectiveness LTL/kg	Area or objects potentially subject to the measure	Measure implementation scope (% from J) [28]	Acceptability, attainability, other assumptions and comments
A	C	D	F	G	H	I	J	K	L
Manure management on small farms	Mandatory in the entire country	Non-reimbursable	LTL 10 LSU	4 (in the root zone)	Farmers' funds	3.3	Livestock on farms < 10 LSU	80%	Acceptability is sufficient. An important condition – provision of information to farmers about new requirements
Mandatory development and introduction of fertilisation plans following the approved methodology on farms from 10 ha	Mandatory in the entire country	Non-reimbursable	LTL 100 per field	2.5 (in the root zone) in agricultural land (or 5 in the over-fertilised zone)	Farmers' funds	Depends on the farm size, number of fields	Agricultural land owned by farms ≥ 10 ha	80%	Acceptability is insufficient, may entail the risk of failure to achieve objectives. An important condition – education of farmers.
Increase of the manure absorption capacity coefficient in the fertilisation plan development methodology	Mandatory in the entire country	Non-reimbursable	LTL 0 per LSU	8 (in the root zone)	Farmers' funds	0	Livestock on farms ≥ 10 LSU	80%	1. In practice, it concerns the reduction of fertilisation norms for farmers using organic fertilisers. If farmers observe fertilisation plans, the measure will be implemented. 2. It is assumed that the share of animal manure generated on farms with more than 10 LSU (from the total amount of manure) is proportionate to the share of hectares which belongs to farms larger than 10 ha.
Reduction of fertilisation norms by 20% as compared to the optimal one	Optional in identified areas	Reimbursable in the case of losses	0 LTL per ha for the state, LTL 50 per ha from the EU The exact allowance amount should depend on calculation carried out during the development of fertilisation plans	8 (in the root zone)	New scheme under RDP, however, no funds have been envisaged for this measure	0 for the state, EU 6 - 7	Agricultural land owned by farms larger than 10 ha in identified areas	20%	158.1. The planned scope of the implementation can be ensured by establishing an attractive reimbursable amount. 158.2. A risk of failure to achieve the objectives arises because the measure is expedient only in specific areas, which is very difficult to control.
Sowing of sandy and mixed soils with catch crops	Optional in identified areas	Reimbursable	0 LTL per ha for the state, EU LTL 385 per ha	37 (in the root zone) - in sandy soil, or 25 (in the root zone) in mixed soil	New scheme under RDP, however, no funds have been envisaged for this measure	0 for the state, EU 11-13 (sandy soil) 16-19 (mixed soil)	Sandy or mixed agricultural land where summer crops are grown in identified areas	30%	158.3. The planned scope of the implementation can be ensured by establishing an attractive reimbursable amount. 158.4. A risk of failure to achieve the objectives arises because the measure is expedient only in specific areas, which is very difficult to control. 158.5. The measure is also beneficial for

[25] Assumptions used for the estimations
[26] The cost estimation methodology is provided in the part on the description of measures at each individual measure
[27] The effect estimation methodology is provided in the part on the description of measures at each individual measure
[28] The share from the maximum potential implementation scope

									farmers

Alternative measures for which no additional funds until 2015 are proposed at this stage[29]

Measure	Investment costs, unit/LTL	Annual operating costs, unit/LTL	Effect of a unit, N kg[30]	Source of financing	Effectiveness, LTL/kg[31]	Reasons of the rejection/postponement of the measure
Grassing of arable land	LTL 0 per ha	LTL 600 per unit	61 (in the root zone in sandy soil), 31 (in the root zone in mixed soil)	Existing scheme under RDP (up to 1000 ha per year until 2013). No additional source of financing	10-12 (in sandy soil), 21-23 (in mixed soil)	There is very little sandy soil in areas where this measure is required, therefore the actual cost effectiveness indicator is 21-23 kg/ha, so the measure is rather expensive.
Artificial wetlands/ sedimentation catchments	LTL 45 000 per ha	LTL 1 800 per unit	500 (in the flow)	None	11	The measure is not recommended for the first stage because neither its effectiveness nor longevity under the Lithuanian natural conditions has been fully investigated. In addition, the measure requires large investments. Hence pilot projects on the application of this measure are required in the first place.
Restoration of wetlands[32]	LTL 600 – 93 000 per ha	LTL 300 – 47 000 per ha	Depends on the wetland type	Non	7-5400	The measure is not recommended for the first stage because the effectiveness of restored wetlands has not been adequately analysed in Lithuania. In addition, this measure would require large investments and also problems may arise in relation to land property issues and other formalities.
Afforestation of arable land	LTL 2 5000 per ha	(included in investment costs because they will be required only in the first year)	Up to 42% or 30-60 (in the root zone)	Support scheme under RDP. Sufficient funds, however, the allowance amount should be increased	32-35 (in sandy soil), 62-71 (in mixed soil)	1. No conditions have been provided for afforestation of fertile soils because the most significant pollution is registered in fertile strategically important land. 2. Though funds provided for in the RDP are sufficient, the allowance amount should be increased so that the measure becomes attractive for farmers on fertile land.
Growing of short rotation woody energy crops	LTL 7000 per ha	LTL 200 per ha	38 (in the root zone)	Support scheme under RDP. The allowance amount should be increased	20-23	1. This is an expensive alternative. 2. Controversial measure due to its environmental aspects (growing of such crops in large areas is controversial because of its effect on biological diversity). 3. So far the measure is not sufficiently attractive for farmers. To be able to increase its implementation in areas with significant agricultural pollution and fertile soils, the allowance amount should be increased. 4. Additional funds would be required in order to achieve a larger scope of the implementation and more significant reduction of diffuse pollution.
Organic farming	LTL 0 (reflected in operating	LTL 700 per ha	23 (in the root zone)	Funds envisaged under RDP 2007-2013	39-45	1. An expensive measure. No funding source for additional areas. 2. The measure is more suitable for the protection of groundwater against pesticides.

[29] A number of these measures are financed under the RDP. In this regard two potential separate actions were discussed: 1. To amend the RDP without allocating additional funds so that the RDP contributes to the attainment of the water protection objectives to the maximum extent. This measure has been proposed for the implementation. 2. To allocate additional funds for the implementation of the measures irrespectively of the RDP. This possibility was rejected due to the reasons given in the table.

[30] The effect estimation method is provided in the section on the description of the measures under each individual measure

[31] The indicator is calculated separately (for the entire basin or RBD) because the measure is also mandatory for areas where reduction of agricultural pollution is not required. In such case the effectiveness indicator equals to zero. The same is true for the measure of fertilisation plans.

[32] More detailed information is provided in the study "Feasibility study and recommendations on construction/restoration of wetlands aiming to reduce input of organic and biogenic substances into water bodies" (2009)

	costs)					
Seasonal clearing of macrophyte overgrowth on the riverside of the Mūša	0	LTL 1 920 per ha	78		25	An expensive measure. No funding source.
Seasonal clearing of macrophyte overgrowth in the riverbed of the Mūša	0	LTL 3 595 per ha	25		144	An expensive measure. No funding source.
Application of non-arable agriculture and stubble sowing			50% (in the case of non-arable agriculture)			1. Reduced or non-arable farming under the Lithuanian conditions often results in many adverse effects, such as increase of vegetative weeds in little cultivated areas and decrease of harvest. When ploughing is reduced, the use of pesticides has to be significantly increased, which has a negative impact on water quality. 2. Land cultivation costs are lower as compared to the ordinary practice; however, the impact on the harvest has not been assessed.

Source: summary of experts' estimations

Summary of measures to reduce diffuse pollution in the Lielupė RBD

135. All water bodies in the category of rivers within the Lielupė Small Tributaries Sub-basin have been designated as water bodies at risk due to the impact of diffuse agricultural pollution. This means that supplementary measures for reducing agricultural pollution are required in the entire sub-basin where seven problematic catchments are situated[33] (with the total area of 94 545 ha). Diffuse pollution with nitrate nitrogen leaching into water bodies may have to be reduced by 8 kg/ha, or by 795 thousand kg in total.

A summary of the measures for the Lielupė Small Tributaries Sub-basin is given in Table 43.

Table 43. Measures to reduce diffuse pollution from agricultural sources in the Lielupė Small Tributaries Sub-basin

Measures for Lielupė Small Tributaries Sub-basin	Measure application scope, ha/LSU/unit	Effect of the measure on N reduction, kg/year	Annual costs, LTL
Manure management on small farms	11 389 LSU	45 946	113 893
Fertilisation plans on farms ≥ 10 ha	75 003 ha	400 153	533 301
Implementation of measures under RDP under more favourable conditions in identified areas	currently applied	18 887	0
Implementation of a new support scheme: application of a fertilisation norm 20% lower than the optimal one	9 850	68 508	492 480
Implementation of a new support scheme: growing of catch crops in sandy soils	1 183	40 640	455 584
Implementation of a new support scheme: growing of catch crops in mixed soils	2 786	60 092	1 072 693
Additional control	-	-	17 598
Total:		634 225	2 685 549

Source: experts' estimations

The annual costs of the measures required to reduce diffuse pollution in the Lielupė Sub-basin would total to around LTL 2 686 thousand. Farmers with more than 10 ha of land who will have to develop fertilisation plans would have to spend LTL 533 thousand and farmers who keep up to 10 LSU – about LTL 114 thousand. The annual burden to the state would total to LTL 17.6 thousand for the control of the implementation of the measures. LTL 2 021 thousand are expected from the EU for new compensatory schemes. The listed measures are not sufficient for reducing pollution to the required level in six catchments of the Lielupė Small Tributaries Sub-basin.

136. In the Mūša Sub-basin, supplementary measures for reducing agricultural pollution are also required in the entire area (27 catchments, 417 838 ha). However, the pollution input in water bodies to be reduced is only 4.4 kg/ha. The aggregate amount of total nitrogen which has to be removed is 2 108 tonnes.

A summary of the measures for the Mūša Sub-basin is given in Table 44.

[33] Units used in the mathematical model applied for the assessment of agricultural pollution.

Table 44. Measures to reduce diffuse pollution from agricultural sources in the Mūša Sub-basin

Measures for Mūša Sub-basin	Measure application scope, ha/LSU/unit	Effect of the measure on N reduction, kg/year	Annual costs, LTL
Manure management on small farms	33 982 LSU	264 146	339 818
Fertilisation plans on farms ≥ 10 ha	140 578 ha	1 618 935	1 641 375
Implementation of measures under RDP under more favourable conditions in identified areas	currently applied	69 762	0
Implementation of a new support scheme: application of a fertilisation norm 20% lower than the optimal one	18 432 ha	182 339	921 588
Implementation of a new support scheme: growing of catch crops in sandy soils	3 470 ha	113 319	1 335 937
Implementation of a new support scheme: growing of catch crops in mixed soils	4 213 ha	95 439	1 622 145
Additional control	-	-	67 372
Total:		2 343 941	5 928 234

Source: experts' estimations

The annual costs of the measures required to reduce diffuse pollution in the Mūša Sub-basin would total to around LTL 5 928 thousand. The major amount would have to be borne by farmers with more than 10 ha of land who will have to develop fertilisation plans (LTL 1 641 thousand) and farmers who keep up to 10 LSU (LTL 340 thousand). The annual burden to the state would total to LTL 67 thousand for the control of the implementation of the measures. The listed measures are not sufficient to reduce pollution to the required level in three catchments of the Mūša Sub-basin.

137. Pollution with nitrate nitrogen is not that urgent in the Nemunėlis Sub-basin. There are two water bodies in the sub-basin where concentrations of nitrate nitrogen fail the good ecological status requirements due to diffuse agricultural pressures and two water bodies where exceedances are determined by the aggregate impact of point and diffuse pollution. Supplementary measures for reducing diffuse agricultural pollution in the Nemunėlis sub-basin are required in the total area of 12 188 ha, the pollution reduction demand here is 0.8 kg/ha (in total 12 775 kg).

A summary of the measures for the Nemunėlis Sub-basin is given in Table 45.

Table 45. Measures to reduce diffuse pollution from agricultural sources in the Nemunėlis Sub-basin

Measures for Nemunėlis Sub-basin	Measure application scope, ha/LSU/unit	Effect of the measure on N reduction, kg/year	Annual costs, LTL
Manure management on small farms	10 642 LSU	14 474	106 420
Fertilisation plans on farms ≥ 10 ha	31 469 ha	49 584	719 511
Additional control	-	-	13 221
Total:		64 059	839 151

Source: experts' estimations

The annual costs of the measures required to reduce diffuse pollution in the Nemunėlis Sub-basin would total to around LTL 839 thousand. The major amount would have to be borne by farmers with more than 10 ha of land who will have to develop fertilisation plans (LTL 719.5 thousand) and farmers who keep up to 10 LSU (LTL 106 thousand.

The annual burden to the state would total to LTL 17.6 thousand for the control of the implementation of the measures.

138. A summary of measures to reduce diffuse pollution from agricultural sources in the entire Lielupė RBD is provided in Table 46.

Table 46. Measures to reduce diffuse pollution from agricultural sources in the Lielupė RBD

Measures for Lielupė RBD	Measure application scope, ha/LSU/unit	Effect of the measure on N reduction, kg/year	Annual costs, LTL
Manure management on small farms	56 013 LSU	324 567	560 131
Fertilisation plans on farms ≥ 10 ha	247 050 ha	2 068 673	2 894 187
Implementation of measures under RDP under more favourable conditions in identified areas	currently applied	88 649	0
Implementation of a new support scheme: application of a fertilisation norm 20% lower than the optimal one	28 281 ha	250 848	1 414 068
Implementation of a new support scheme: growing of catch crops in sandy soils	4 653 ha	153 958	1 791 520
Implementation of a new support scheme: growing of catch crops in mixed soils	7 000 ha	155 531	2 694 838
Additional control	-	-	98 190
Total:	-	3 042 225	9 452 934

Source: experts' estimations

139. After the application of the measures approved by Resolution No. 1098 of the Government of the Republic of Lithuania of 21 July 2010, nine catchments, or 27 water bodies, will still be facing pollution problems (Figure 9, Table 47). Following the assumptions on the cost-effectiveness of the measures, the cheapest way to remove pollution therein would be to create artificial wetlands/sedimentation catchments, where the reduction of 1 kilogram of total nitrogen would cost LTL 11. However, this measure has not been tested in Lithuania and it would be risky to apply it on a large scale. Therefore only a pilot project is recommended, postponing the implementation of the measure until the next stage. The Water Framework Directive provides for that in such case other alternative measures should be analysed.

140. Other, more expensive, measures can also be used for the attainment of good ecological status, such as conversion of cultivated agricultural land into extensive grasslands (effectiveness – LTL 12-24 per kg), growing coppices for energy production or afforestation of cultivated land.

As already said in the description of the measures, the growing coppices for energy production in large areas has been receiving controversial opinions due to their impact on biological diversity, meanwhile afforestation of fertile soils is a hardly feasible because of the current agricultural policy, which says that fertile land has to be used for agricultural purposes. Consequently, both the growing of energy crops and afforestation are measures which are very limited in their scope. In addition, according to data of the Ministry of Agriculture, energy crops at present are not an attractive option for farmers. Even if compensatory allowances, financing rules and other necessary legislation are amended, the actual scope of the application of the measure would be as little as 1-2% of cultivated land.

With regard to cost-effectiveness, an alternative measure could be conversion of cultivated land to extensive grasslands. Should the measure be implemented in 7% of cultivated land (in the event of an attractive allowance, it could be applied on a larger area, only in such case this would no longer be effective), pollution would go down to the required extent in seven more catchments. The measure would require LTL 3 478 every year. Having in mind the affordability of the measure to the state (paragraph 157), such amount is too large hence it is proposed to extend the deadline for achieving the water protection objectives in these water bodies.

Estimations of the achievement of the water protection objectives in the entire Lielupė RBD also covered the costs of measures which have not been proposed at this stage but which could potentially be applied. As already said, the conversion of cultivated land into extensive grasslands could be applied in seven catchments and this would cost about LTL 3.5 million. It would be difficult to reduce pollution in two catchments because of the natural conditions and absence of measures suitable for such cases. It is assumed that artificial wetlands could be created in these two catchments in future. This would require additional investments in the amount of at least LTL 5 625 thousand, operating costs would total to LTL 225 thousand (or LTL 665 thousand of annualised costs). Summing up, the achievement of the water protection objectives in the Lielupė RBD would require LTL 13 596 thousand.

It is proposed to postpone the achievement of the good ecological status objective in nine catchments after 2015 due to a lack of funds; in two of these catchments the reduction of pollution down to the required level is also complicated for the reason of technical feasibility – due to the prevailing soil type (practically there are no sandy soils) and low flow. Accordingly, the application of the available measure would not be effective.

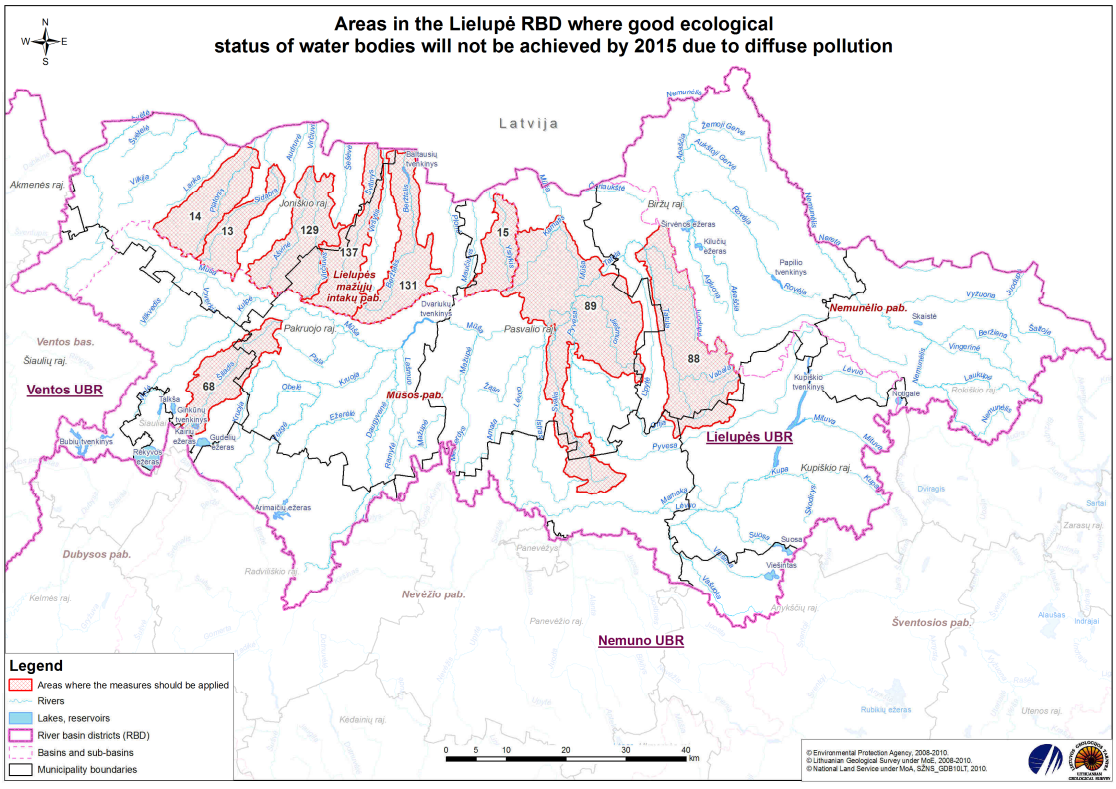

Figure 5. Areas in the Lielupė RBD where good ecological status of water bodies will not be achieved by 2015 due to diffuse pollution

Table 47. Wards where good ecological status of water bodies will not be achieved by 2015 due to diffuse pollution

Alizava ward, Kupiškis distr. munic.; Daujėnai ward, Pasvalys distr. munic.; Gataučiai ward, Joniškis distr. munic.; Guostagalis ward, Pakruojis distr. munic.; Joniškis ward, Joniškis distr. munic.; Kairiai ward, Šiauliai distr. munic.; Karsakiškis ward, Panevėžys distr. munic.; Kepaliai ward, Joniškis distr. munic.; Krinčinas ward, Pasvalys distr. munic.; Kriukai ward, Joniškis distr. munic.; Kupiškis ward, Kupiškis distr. munic.; Linkuva ward, Pakruojis distr. munic.; Lygumos ward, Pakruojis distr. munic.; Meškuičiai ward, Šiauliai distr. munic.; Namišiai ward, Pasvalys distr. munic.; Pasvalys ward, Pasvalys distr. munic.; Pašvitinis ward, Pakruojis distr. munic.; Pumpėnai ward, Pasvalys distr. munic.; Rūdiškės ward, Joniškis distr. munic.; Saločiai ward, Pasvalys distr. munic.; Satkūnai ward, Joniškis distr. munic.; Saugėlaukis ward, Joniškis distr. munic.; Širvėna ward, Biržai distr. munic.; Skaistgiris ward, Joniškis distr. munic.; Vabalninkas ward, Biržai distr. munic.; Vaškai ward, Pasvalys distr. munic.; Žeimelis ward, Pakruojis distr. munic.

Source: experts' distribution

Measures to improve hydromorphological status

141. The main reasons which determine hydromorphological changes in water bodies and thus prevent the achievement of good ecological status in some bodies of water are related to artificial barriers (disruption of river continuity). To eliminate these causes or mitigate their impact, measures are proposed for restoring/ensuring river continuity and flow.

Construction of fish bypass facilities

142. The most important measure which ensures river continuity is construction of fish bypass facilities.

An artificial barrier mechanically blocks the water way for the migration of water organisms. This impact is most significant for migratory fish: they are blocked from the river stretch upstream of the barrier, therefore the fish species variety in such river stretch is always much lower than in the stretch downstream of the barrier (at the expense of migratory and, in a way, semi-migratory fish species). As a result (due to the decreased variety of sensitive fish species), the ecological status of the river stretches upstream of the artificial barrier is always lower by the fish index than the ecological status of those downstream of the barrier. Construction of fish bypass facilities mitigates the said impacts. However, measures which are necessary to ensure (or improve) conditions for fish migration produce different effects on the status of fish populations. Some rivers are particularly important for the reproduction of migratory or semi-migratory fish and hence migration barriers have a highly significant impact on the status of their populations (and also on the ecological status of the river), meanwhile construction of fish passes (or removal of barriers for migration) in other rivers would produce a lower effect. Accordingly, different priorities were given to the measures designed to provide for conditions for fish migration. A higher priority was granted to migration conditions in rivers (at the barriers) which are important for migratory fish, including the fish species and lamprey species protected under the Habitats Directive. Provision of adequate migration conditions in these rivers would enhance the overall status and resources of the said fish populations in Lithuania and would improve the ecological status (by fish indices) of the river stretches upstream of the artificial barriers.

The fish species protected under the Habitats Directive in the Mūša Sub-basin are the River Lamprey (migratory fish) and the Asp (semi-migratory fish). The migration of these species to the largest tributary of the Mūša, the Lėvuo, is prevented by Pasvalys

dam situated in the very lower reaches of the river. Hence the construction of a fish pass at this dam is given a higher priority. Other barriers for fish migrations are located in the stretches of the Lėvuo upstream of Pasvalys. Here, fish migration conditions should be improved only if the path for migration is opened up at the dam in Pasvalys and thus the species specified in the Habitats Directive settle in the lower stretch of the Lėvuo. Following the criteria set for the Nemunas RBD, the barriers for fish migration in the Lielupė RBD would be given lower – second and third – priorities.

On the basis of expert judgement, the fish bypass facilities required and the barriers to be removed in the Mūša Sub-basin, observing the priorities given under the table, are as follows:

Table 48. Fish migration facilities and dam remains to be removed in the Mūša Sub-basin and their costs, LTL

River	Dam location	Measure*	District	Notes	Investment costs, 2009**, LTL
Fish migration facilities***					
Lėvuo	Pasvalys (1)	Fish pass (ladder)	Pasvalys distr.		147 882
Lėvuo	Akmeniai HPP(2)	Fish pass (ladder)	Kupiškis distr.	Operating small HPP	9 274
Barriers to be removed					
Lėvuo	Karsakiškis mill(2)	to remove remains of the rock weir	Panevėžys distr.		10 527
TOTAL					**168 000**

Source: List of Dams where Facilities for Fish Migration are Required and List of Former Dam Remains where Barriers for Fish Migration Have to Be Removed
* - (1) a higher priority measure; (2) a lower priority measure;
** Costs taken from the study "Improvement of fish migration conditions in ichtiologically important rivers" (Gedilieta and Institute of Ecology, 2001) and adjusted for 2009 taking into account the inflation;
*** On the Lėvuo, a fish pass at the dam in Pasvalys situated in the very lower reaches of the river should be constructed in the first place.

The improvement of fish migration conditions in the Mūša Sub-basin would require around LTL 168 thousand of investment costs. If this amount is distributed evenly on a yearly basis from 2011 until 2015, the annual demand would be about LTL 34 thousand. The annual total costs at the average lifecycle of 50 years would be approximately LTL 15 400.

Remeandering of rivers

143. The length of straightened rivers in the Lielupė RBD totals to 1321 km. The length of water bodies at risk is 702 km and of water bodies at risk flowing over plains is 412 km.

Remeandering is an expensive process and may lack justification as compared to its benefits. Hence, the following is proposed for the Lielupė RBD:

143.1. to leave the stretches of rivers flowing in the upper reaches of rivers, in hilly, springy, laky and protected areas which already are in the process of the natural regaining of their original state for complete self-naturalisation;

143.2. to perform renaturalisation of rivers only in areas with a clear public demand (settlements, parts, etc.) as well as in places where the naturalisation can have a

significant effect of minimising floods, capturing pollutants and increasing/restoring biodiversity (habitats of plants and animals);

120.3. to leave the stretches of rivers in non-agricultural areas for self-naturalisation controlling this process with regard to drainage needs in the upstream and downstream areas.

The studies “Preparation of a feasibility study and recommendations on the establishment/restoration of wetlands aiming to reduce the input of organic and biogenic emissions into water bodies” and “Preparation of a feasibility study on the restoration of morphological and ecological conditions close to the natural ones in straightened rivers and streams and development of practical recommendations for the activities to restore the said conditions” analysed remeandering costs. Although such costs depend on the river width, slope of the depth and other characteristics, the average demand of investment costs for one kilometre is about LTL 100 thousand (including land acquisition costs).

The costs of the remeandering of rivers at risk in the Lielupė RBD to the maximum extent to be borne by the state would total to approximately LTL 41 million. The operating costs can be equated to zero. The total annual costs would be around LTL 2.6 million.

However, it is not clear where such additional funds could be obtained because it has been established that potential funding sources for 2007-2013 already have their respective investment objects planned. At present, the state would not be able to afford such measure. Besides, an impact of the remeandering on the ecological status of a stream in question is not known yet. Hence it is recommended that actions until 2015 are limited to the implementation of a pilot project on renaturalisation in the Nemunas RBD.

Research

145. There are a few water bodies in the Lielupė RBD where data is lacking on causes which determine their poor status. Hence additional research is required before proposing status improvement measures for these water bodies.

Loads of surface runoff on the rivers Laukupė and Nemunėlis are not clear in Rokiškis. Accordingly, a study of the runoff is proposed for establishing loads of BOD_7, biogenic substances, oil substances and heavy metals.

Research is also required in Rozalimas and Mikoliškis to be able to identify the impact of effluents discharged from these settlements on the rivers Daugyvenė and Atmata.

Pollution load models suggest that the ecological status of Lake Talkša should be high; however, according to both monitoring data and lake study findings, the ecological status of the water body is lower than good. It should be noted that, following the modelling data, point pollution in Lake Talkša accounted for 86% (although as such it should not be exerting a significant impact). The status of Lake Talkša may be materially affected by pollutants transported with surface runoff from the urban areas. Also, it is highly likely that the lake is being polluted with wastewater discharged from households illegally connected to the surface runoff collection system. Hence inventory of pollution sources and investigative monitoring are required in order to identify the causes determining poor status of this lake.

Poor ecological potential of Lake Rėkyva may be determined by the inflow of biogenic substances caused by its shore erosions (as a result of hydromorphological changes in the lake) as well as by pollution from unidentified pollution sources.

Rėkyva is situated in a wetland complex, the eastern shore of the lake adjoins a moraine ridge. Under natural conditions, such lakes do not have steady surface runoff and short-term surplus of water runs off through a descent in a low-lying bog. The stability of the shores of lakes situated in wetland complexes is conditioned by the natural balance of the lake, changes in which can lead to re-formation of the shores and shallow water. Water circulation in such lakes is extremely slow, therefore even the slightest pollution can impair their water quality.

The water regime of Lake Rėkyva has been artificially regulated from the end of the 19th century already. The present hydrographic connection was established in 1959 when Kulpė Canal was reconstructed by constructing a hatchless sluice therein. Approximately at that time a collector of surface runoff from Rėkyva settlement was also constructed on the eastern shore of Lake Rėkyva. The garden area on the north-eastern shore of the lake has become a residential area with no household wastewater collection and treatment systems hence a certain amount of wastewater may be entering Lake Rėkyva. When a water level raising system was constructed in the said sluice in 1978, the water level of the lake increased and is currently 30 cm higher than the natural one. 70-80% of the lake shores consist of peat ground which determines significant abrasion of the shores, especially in winter when ice expands.

A peat quarry of Rėkyva is situated in the south of the lake. The residual strip of a raised bog in the width of 400-600 meters between the lake and the peatbog has been broken in many places by choked reclamation ditches and narrow self-restoring peat extraction strips. Negative changes in the hydrological regime have been occurring, with the divide moving closer to the lake. An environmental impact assessment will be carried out before deepening the drainage ditches of Rėkyva peat quarry.

A number of key measures have been taken recently to reduce the adverse impact of the exploitation of the peat quarry on Lake Rėkyva to the maximum extent:

145.1. A working group of independent experts conducted an analysis of past scientific studies, which maintain that the exploitation of the peat quarry is not a crucial factor determining the eutrophication and sinking of the lake.

145.2. A Monitoring Programme for Rėkyva Peat Field has been prepared by Dr. J. Taminskas and approved by the Environmental Protection Department of Šiauliai Region on 23 July 2010. The Programme will cover such measures as monitoring of the water level in the strip between the lake and the bog, measurement of water runoff and quality, assessment of the impact of the water volume which does not enter the lake from the peat field on the lake water level as well as the impact of the drainage of the peat field. Also, the sinking of the surface of the bog e will be registered in the raised bog strip situated between the exploited peat field and Lake Rėkyva. All this information will be provided to the general public. Private capital investments will total to more than LTL 300 thousand.

It is recommended to study changes in the physico-chemical and morphometric parameters of the lake in more detail (to conduct more intensive – investigative

monitoring, including checks of pollution sources situated around the lake and assessment of the extent and rate of the shore erosion as well as changes in the lake depth). Such studies (in parallel with the studies of hydromorphological changes in the lake already conducted) would enable evaluating possibilities to stabilise the ecological potential of the lake.

Causes determining poorer than good ecological status of Lake Skaistė are not clear. Pollution load models suggest that the ecological status of Lake Skaistė should be high. It is highly likely that poor ecological status of the lake has been conditioned by historic pollution. To be able to identify the origin of pollution of this lake at risk (to find out whether it suffers from anthropogenic pressures due to historic or present pollution), detailed studies (investigative monitoring, including monitoring of the near-bottom layer of the lake, checks of the pollution sources around the lake) are required.

Poorer than good ecological status of Lake Notigalė may be determined by natural ageing processes. Besides, this is not a typical lake in Lithuania (with soft brown water). There is not much monitoring data on quality parameters of this lake. Investigative monitoring would allow evaluating the processes in the lake more accurately and assess its actual status.

Groundwater monitoring

146. Two groundwater bodies at risk have been identified in the Lielupė RBD – Joniškis groundwater body and Stipinai groundwater of Upper Devonian deposits. The Programme of Measures for Achieving Water Protection Objectives within the Nemunas River Basin District has envisaged a national measure – groundwater monitoring in all wellfields abstracting > 10 m^3 of groundwater per day and providing this data to the Lithuanian Geological Survey. This measure is also relevant for the said Joniškis groundwater body and Stipinai groundwater of Upper Devonian deposits. An analysis of the monitoring data will enable identifying the boundaries of the wellfields at risk and zones of groundwater suitable for drinking water supply.

Educational measures

147. Educational measures are often very effective, only their impact cannot be measured directly, especially because the effect is produced indirectly and after some time. Planned educational measures for the Lielupė RBD include annual information campaigns for project implementers and the general public, as well as individual groups of interest on the Programme of Measures for the Lielupė RBD, the measures provided for therein, responsible implementers, and the role of the public and its individual groups in the implementation and supervision of the measures.

148. The costs of the necessary research and educational projects are provided in Table 49.

Table 49. Costs of research and educational projects

Measure	Costs		
	Investment / single costs, LTL	**Operating, LTL/year**	**Annual, LTL/year**
Analysis of surface runoff in Rokiškis to identify loads of BOD7, biogenic and oil substances and heavy metals entering the rivers Laukupė and Nemunėlis with surface runoff	10 000		1 000
Assessment of the impact of wastewater discharged from Rozalimas and Mikoliškis settlements on the rivers Daugyvenė and Atmata	10 000		1 000
Extensive research of morphometric, physico-chemical and biological parameters, erosion processes, inventory of pollution sources, analysis of identified pollution sources in Lake Rėkyva	22 000		3 000
Investigative monitoring, including monitoring of the near-bottom layer, and inventory of pollution sources to establish the origin of pollution of Lake Skaistė	23 000		3 000
Investigative monitoring and inventory of pollution sources to identify causes of poor status of Lake Talkša	90 000		12 000
Investigative monitoring and inventory of pollution sources to validate or deny the designation of Lake Notigalė as a water body at risk	18 000		2 000
Education and information campaigns for the general public, farmers and other groups of interest		10 000	10 000
Total:	**173 000**	**10 000**	**32 000**

Source: experts' estimations

Summary costs of supplementary measures and the whole Programme of Measures

149. Summary information on the costs of all supplementary measures is provided in Table 50 below.

Table 50. Preliminary costs of all supplementary measures for the Lielupė RBD

Supplementary measures	**Investment costs, LTL**	**Operating costs, LTL/year**	**Annual costs, LTL/year**
Reduction of point pollution	33 080 000	1 653 995	3 852 600
Reduction of diffuse (agricultural) pollution		12 930 522	12 930 522
Hydromorphological changes	41 600 000	11 900	2 651 100
Research and education	173 000	10 000	32 000
Total ~	**74 900 000**	**14 600 000**	**19 500 000**

Source: experts' estimations

Summary costs of the supplementary measures required until 2015 are provided in Table 51.

Table 51. Preliminary costs of supplementary measures for the Lielupė RBD until 2015

Measures, excl. reduction of point pollution, renaturalisation of river beds and replacement of turbines	**Investment costs, LTL**	**Operating costs, LTL/year**	**Annual costs, LTL/year**
Reduction of diffuse (agricultural) pollution	0	9 452 934	9 452 934
Hydromorphological changes	168 000	5 000	15 000
Research and education	173 000	10 000	32 000
Total ~	**341 000**	**9 470 000**	**9 500 000**

Source: experts' estimations

150. The total costs of the whole Programme of Measures, including both the basic and the supplementary measures, are provided in Table 52 and Figure 6.

Table 52. Implementation costs of the whole Programme of Measures for the Lielupė RBD until 2015

Group of Measures	**Investment costs, LTL**	**Operating costs, LTL/year**	**Annual costs, LTL/year**
Basic measures			
Bathing Water Directive	0	104 420	104 420
Birds Directive	1 940 856	723 203	986 203
Drinking Water Directive	together with the costs of the Nitrates Directive		
Major Accidents Directive	150 000	0	21 000
Environmental Impact Assessment Directive	0	210 000	210 000
Sewage Sludge Directive	79 978 000	2 399 340	9 372 340
Urban Wastewater Treatment Directive	229 610 000	4 592 200	24 611 200
Plant Protection Products Directive	1 912 000	15 000	374 000
Nitrates Directive	69 679 870	696 799	6 771 799
Habitats Directive	399 144	870 750	924 750
IPPC Directive	50 000	0	7 000
Basic measures in total	**383 720 000**	**9 610 000**	**43 380 000**
Supplementary measures			
Point pollution	0	0	0
Diffuse pollution	0	9 452 934	9 452 934
Hydromorphological changes	168 000	5 000	15 000
Studies and education	173 000	10 000	32 000
Supplementary measures in total ~	**341 000**	**9 470 000**	**9 500 000**
Basic and supplementary measures			
GRAND TOTAL ~	**384 100 000**	**19 100 000**	**52 880 000**

Source: experts' estimations

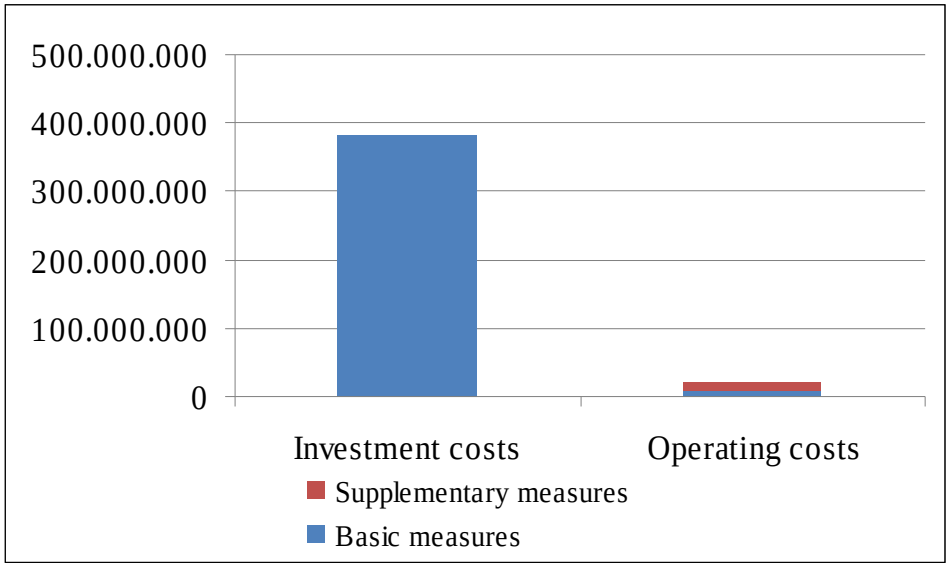

Figure 6. Investment and operating costs of the implementation of the basic and supplementary measures in the Lielupė RBD until 2015
Source: experts' estimations

CHAPTER IV. BENEFITS OF ACHIEVING GOOD STATUS IN WATER BODIES

151. The benefit which will be obtained upon the implementation of the supplementary measures has been estimated on the basis of the findings of the "Study on willingness to pay for improvement of the Nevėžis River water quality to achieve good status" and the "Study on willingness to pay for improvement of the Neris River water quality to achieve good status and remeandering of the Neris". Such relative assessment studies are rather widely used in many countries for the estimating benefits of natural resources (i.e. the benefits which cannot be estimated using conventional economic-commercial methods).

The said two sub-basins are situated in the Nemunas RBD. It is believed that the benefits derived therein may be directly transferred into other sub-basins in Lithuania due to highly similar geographical and social conditions throughout the country.

It was estimated that a statistically reliable monthly amount which respondents agreed to pay in the Nevėžis Sub-basin is LTL 1.85 per household (including the households which agree to pay 0 litas). Such study was conducted in 2007.

152. The "Study on willingness to pay for improvement of the Neris River water quality to achieve good status" identified four scenarios.

152.1. Willingness to pay for improvement of all water bodies in the Neris Sub-basin to achieve good ecological status;

152.2. Willingness to pay for improvement of all water bodies in the Neris Sub-basin to achieve good ecological status and also for remeandering of straightened rivers;

152.3. Willingness to pay for improvement of the water quality of Lake Riešės ežeras to achieve good ecological status;

152.4. Willingness to pay for improvement of the water quality of Lake Riešės ežeras and Lake Didžiulis to achieve good ecological status.

153. In this way statistically reliable figures illustrating willingness to pay both for individual water bodies and for improvement of all bodies of water in the Neris Sub-basin were derived.

In the Neris Sub-basin, the amount agreed to be paid by one household was LTL 40.51 per year, or LTL 3.38 per month only for improvement of the water quality, and LTL 48.18 per year, or LTL 4.01 per month both for improvement of the water quality and remeandering of rivers. In the first case, the amount totals to about 0.29% and in the second case – to 0.36% of the income of the studied households.

In the case of willingness to pay (i.e. to pay more than 0 litas), the payment for improvement of the water quality and remeandering of rivers totals averagely to more than 30% of people's water bills.

Having in mind that the number of population in the Lielupė RBD is totals to about 312 thousand and that the size of one household is 2.63 persons (the average size in Lithuania), the benefit estimated on the basis of the said Neris study in the Lielupė RBD would be around LTL 480 thousand per month, or LTL 5.78 million per year.

It should be pointed out that these figures are provided for the purposes of information on how people in the Nemunas RBD view good status in water bodies.

At the present stage of the development of the Programme of Measures, the measures selected pursuant to a cost-efficiency analysis are those which will be the most effective during the first cycle of the implementation of the Management Plan. The question of whether the costs of a measure intended for achieving good ecological status in a water body are disproportionate or not and whether such costs may serve as a basis for derogation is a political decision based on economic information. Such decision needs comparing relevant costs and benefits. The principle of disproportionate costs, i.e. cost-benefit comparison was not required in any case of extension of the deadline in the Lielupė RBD. All cases of extension are based either on technical uncertainties already discussed or on affordability and/or negative attitude (acceptability) of the public to implement such measures by 2015. The latter is in a way a component of the principle of disproportionate costs. Besides, only extension of the deadline for the attainment of good water status objectives is required and no lower objects are proposed. Consequently, a cost-benefit analysis and the figures illustrating the benefit which are given in this section were not required at this stage.

CHAPTER V. AFFORDABILITY ANALYSIS

154. An affordability analysis plays a very important role in providing rationale for a possibility and deadline to achieve the proposed ecological status in water bodies. Even when measures are feasible technically, they can be too expensive for the specific implementer – household, agricultural unit, municipality, or the state.

Affordability to the state

155. The text below contains comparisons of the demand of investment costs against the existing and future funds from potential financing sources by every measure required:

155.1. EU funds,
155.2. state budget,

155.3. municipal budgets,
155.4. other state or municipal funds.

Wastewater management

156. An analysis of the funding sources for 2007-2013 demonstrated that all investment funds from the EU and the state budget, expecting municipal co-financing, have already been allocated. All of the envisaged funds will be allocated for settlements of more than 2 000 p.e. and therefore no state funding sources will be available for the proposed supplementary measures. The total amount envisaged for the modernisation and expansion of the water sector in Lithuania is LTL 1.6 billion. In addition, another half a billion litas will be allocated for the development of a sewage sludge infrastructure. 71% of this amount will be funded by the European Commission. When this amount is distributed on the annual basis, the annual amount of investments to the water sector totals to around LTL 300 million.

Planned measures in the Lielupė RBD include reconstruction of four existing wastewater treatment plants, construction of 81 km of new sewerage networks and 57 km new water supply networks as well as reconstruction of 6.8 km of the existing sewerage networks and 6.1 km of the existing water supply networks. In addition, drinking water improvement facilities will be constructed in Pakruojis. This will cost around LTL 165 million.

Also, approximately LTL 72 million and LTL 8 million from the same funding sources have been envisaged for sewage sludge management respectively in Šiauliai and Biržai, where sludge from other neighbouring wastewater treatment facilities will be handled as well.

The total allocations for wastewater and sludge management and water supply facilities in the Lielupė RBD until 2013 are estimated at about LTL 250 million.

These are the costs of the basic measures.

The achievement of the established good ecological status objectives requires additional reduction of surface runoff loads in Šiauliai and Pakruojis. According to preliminary estimates, these measures would require about LTL 33 million of investment costs. Although surface runoff management is one of the priority measures identified by the Ministry of Environment, it is not included among the national investment projects which are planned to be implemented by 2013 and which have already been allocated EU and state budget funds, and hence no funding has been envisaged for this measure. In addition, no adequate investment project has been fully prepared for funding as there are no feasibility studies conducted or technical projects developed. Hence there are no possibilities to implement such project during the first stage of the Programme of Measures for the Lielupė RBD. However, efforts should be made to conduct a required feasibility study and prepare technical drawings so that they are completed and ready for implementation after 2013.

Measures to restore hydromorphology

157. Estimates indicate that the construction of fish migration facilities and the removal of old dam remains in the Lielupė RBD require about LTL 168 thousand of investment costs. Though the necessity of the works has been approved by an order of the Minister

of Agriculture, no funds have been allocated for this purpose. Therefore, it is proposed to envisage funds for the construction of fish migration facilities and the removal of old dam remains when developing proposals for the next EU programming period (2014-2020).

158. Remeandering costs in the Lielupė RBD, if decided to restore meanders, would total to about LTL 41 million. If these investment costs are distributed for a five years' period (until 2015), the annual demand of additional costs would be about LTL 8 million.

However, it is not clear where such additional funds could be obtained because it has been established that potential funding sources already have their respective investment objects planned. At present, the state would not be able to afford such measure. Besides, an impact of the remeandering on the status of a stream in question is not known yet. Hence it is recommended that actions until 2015 are limited to the implementation of a pilot project on renaturalisation in the Nemunas RBD.

Agriculture

159. Following the developed programme of measures, the allocations for all agriculture-related measures from the state budget and the EU (under the RDP for 2007-2013) should total to more than LTL 10.1 million. LTL 98 thousand of this amount would cover the costs of control of fertilisation plans and manure storages on small farms throughout Lithuania; LTL 9.4 million would be allocated for the introduction of support schemes in identified areas and at least LTL 700 thousand – for the reduction of pollution in areas where this is a difficult task due to natural conditions. It is proposed that the latter amount is not allocated at this stage because the achievement of the water protection objectives in those areas is feasible only upon application of technical measures the suitability of which under the Lithuanian conditions still has to be tested. It is considered that the state cannot afford LTL 700 thousand for risky investments at the moment.

159.1. Additional state funds for controls over the implementation of the development of fertilisation plans for farms with 10 ha and more and manure management on small farms (with less than 10 LSU) would amount to about LTL 98 thousand every year. This means a demand of additional 3.6 employees, if the average wage in the public sector in 2009 is applied (LTL 2 283 per month). Should this function be divided among six municipalities which occupy the largest areas in the Lielupė RBD and which have agricultural land, the respective environmental agencies would require 0.6 of an additional employee. A solution would be to revise the functions of the specialist in charge of control over the implementation of agricultural measures.

159.2. It is proposed to finance support schemes for the application of fertilisation norms 20% lower than the optimal one and for the growing of catch crops in sandy and mixed soils from the funds of the RDP for 2007-2013. The annual demand would be LTL 5.9 million. The implementation of the support scheme „Application of a fertilisation norm 20% lower than the optimal one" would cost LTL 1.4 million and would enable reducing the amount of total nitrogen by 251 tonnes (LTL 5.6 / kg on average). The scheme "Growing of catch crops in sandy and mixed soils" would cost LTL 4.5 million and would enable reducing the amount of total nitrogen by 310 tonnes (LTL 14.5 / kg on average). If the EU approves these new support schemes contributing to the attainment of the water protection objectives, a corresponding budget should be

formed by applying for additional EU funds and reallocating funds of the support schemes under the RDP for 2007-2013 which have already been envisaged for the implementation but which have not been used yet due to various reasons. The amount of LTL 5.9 million does not exceed 0.1% of the present budget of the RDP for 2007-2013 (LTL 7.8 billion) hence it is considered that the necessary budget can be drawn up.

159.3. The annual amount envisaged for the scheme of support for the conversion of soils into extensive meadows under the RDP for 2007-2013 is more than LTL 400 thousand. Since the allowance for the implementers of the measures is too low, the measure has not been implemented to the required extent. It is believed that an increased allowance would raise the acceptability of the measures. To be able to implement the measures to the planned extent, LTL 3.5 million would be required, and this would enable reducing total nitrogen in water bodies by 180.5 tonnes (LTL 19.3 / kg on average). Such amount makes up 0.05% of the RDP budget; together with the amount for the said support schemes (LTL 5.9 million) it would exceed 0.1% of the RDP budget. It is considered that it would be complicated to draw up such budget by reallocating funds of the RDP, and the state cannot afford allocating additional funds due to continued financial difficulties. Besides, it is expected that after 2015, when the results of pilot projects on the creation of artificial wetlands will be available and more experience will have been gained in implementing other instruments, the achievement of the water protection objectives will be up to twice cheaper than by converting to extensive meadows. Consequently, it is proposed to implement the support scheme for the conversion of cultivated soils to extensive meadows only to the extent affordable under the present RDP budget.

Research and educational projects

160. In addition to investment costs, one-time costs will be required in the Lielupė RBD for supplementary research, trainings and education, totalling to around LTL 173 thousand. Of the said amount, LTL 73 thousand (42% of the required costs) are planned to be allocated during 2015-2015. Accordingly, LTL 100 thousand would be required from the state budget for research until the next financing period: LTL 33 thousand in 2011, LTL 22 thousand in 2012 and LTL 45 thousand in 2013.

Racionaliai planuojant ir naudojant lėšas, papildomų priemonių finansavimas neturėtų sukelti neigiamo poveikio valstybės, konkrečiai Aplinkos ministerijos ir Aplinkos apsaugos agentūros, biudžetui.

After 2013, if the EU co-financing accounts for 75% of the value of one-time projects, the contribution of the national budget would total to LTL 73 thousand, or approximately LTL 37 thousand in 2014 and LTL 37 thousand in 2015. In the event of rational planning and use of funds, the financing of supplementary measures is not expected to constitute a burden to the state budget, i.e. the budget of the Ministry of Environment.

Municipal affordability

Wastewater management

161. Surface runoff management projects for Šiauliai and Pakruojis are not going to be implemented during the first stage of the Programme of Measures for the Lielupė RBD, therefore today the municipalities have simply to include the projects into future plans (after 2013) and take care of adequate preparation of the required documents.

If a similar procedure is applied in the next EU financing period after 2013 as today (2007-2013) and if the EU co-financing makes up 70% of the investments of a project, the municipalities would have to co-finance the remaining amount of 30%: Šiauliai city municipality – about LTL 9.6 million and Pakruojis town municipality – LTL 65 thousand 2010 prices.

Measures to restore hydromorphology

162. The state contribution has been envisaged for the construction of fish passes and removal of dam remains in addition to the EU support, hence no burden will be placed on municipalities.

Affordability to households

163. No additional costs will be required for wastewater management in the Lielupė RBD therefore affordability of this measure to households has not been estimated.

Other supplementary measures do not have any effect on the burden for households.

Affordability to the energy sector

164. There is one HPP in the Lielupė RBD the turbine of which should be replaced due to its environmental impact.

The replacement would cost about LTL 240 thousand. However, no funds have been envisaged for the planning period 2007-2013. The solution is to plan the implementation of this measure for a later financing period.

It is proposed to make use of the EU support allocated through the Ministry of Economy or the Ministry of Energy.

Affordability to the agricultural sector

165. As in the entire country, first of all the basic measures to reduce diffuse pollution are proposed for the Lielupė RBD, namely, enactment of fertilisation norms and introduction of the requirement to develop and implement fertilisation plans for farmers with 10 and more ha and to observe Good Farming Rules for farmers with less than 10 LSU. The costs of these measures would have to be borne by farmers.

Development and implementation of fertilisation plans is recommended for all farms in Lithuania with 10 and more ha of land. The number of farms with 10 to 100 ha who would have to develop fertilisation plans under this Programme of Measures in the Lielupė RBD totals to more than 5 800 (data of 2007). Pursuant to the Environmental Requirements for Manure and Slurry Management, as from 2011, fertilisation plans will also have to be developed by farms with 100 ha and more. There were 730 such farms in the Lielupė RBD in 2007. It is assumed that only a small number of farms are preparing fertilisation plans at the moment, so the effect of the measure was estimated for all farms with 10 ha and more.

The annual costs of all farms with less than 10 LSU in the Lielupė RBD total to approximately LTL 560 thousand. This amount is based on the assumption that the annual costs of manure management following the good practice requirements on a

small farm will be as low as LTL 10 per one livestock unit. The total annual costs of the development of fertilisation plans in the Lielupė RBD amount to LTL 2.9 million assuming that the development of one fertilisation plan for an average farm costs about LTL 500.

The share of expenses of a farm with 5 fields and 5 LSU for the envisaged measures in variable and fixed costs and profit with subsidies would make up about 0.4-1.5%. Hence the costs of both the development of fertilisation plans and implementation of the manure management requirements are deemed to be acceptable, even when these two measures have to be implemented together.