

MINISTRY OF ENVIRONMENT OF THE SLOVAK REPUBLIC

Elaborated by: Water Research Institute Bratislava

Report

on Water Management
in the Slovak Republic in 2008

Bratislava 2009

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1 ROLE OF WATER MANAGEMENT

In 2008, the water management sector of the Slovak Republic continued in the process of fulfilling the tasks which result from the obligations related to building of water supply infrastructure. These commitments were set within the accession process of Slovakia to the European Union together with the tasks associated with implementation of the Water Framework Directive establishing a framework for Community action in the field of water policy.

Implementation of new policy in water management moved the process from solving the partial problems to a comprehensive approach to protection and use of water and related ecosystems regarding their quality and quantity. New approach to water protection allows the development of unified water quality assessment system within the EU countries which brings reliable and comparable results on the status of water bodies in any European region as well as the uniform process in defining the objectives and implementing the measures for protection and improvement of water quality and quantity.

Water management policy should be linked with other industries of national economy as it is important to cooperate with national authorities, local authorities, civic organizations and NGOs. Moreover, the coordination of policy-making process is necessary at every level of administration.

2 ORGANIZATION, MANAGEMENT, MACROECONOMICS AND PROPERTY STRUCTURE

2.1 Organization and Management

The water management is legally regulated under the Act No. 139/2003 Coll. amending the Act No. 575/2001 Coll. on Organization of Activities of the Government and Central State Authorities as amended in later regulations and the Act No. 312/2001 Coll. on State Services and on amendment to some acts in wording of later regulations.

The Ministry of Environment of the Slovak Republic is a central body of the state administration responsible for environment and environmental protection, including:

- water management
- protection of water quality and quantity and its reasonable use under the Act No. 364/2004 Coll. on Waters and on amendment to the National Council Act no. 372/1990 Coll. on offences as amended in later regulations (Water Act), the Act No. 442/2002 Coll. on public water supply and public sewerage and on amendments to the Act No. 276/2001 Coll. on regulation of network industries as amended in later regulations
- flood protection
- fishery except aquaculture and sea fishing

The Section of Water and Energy Resources is an organizational body of the Ministry of Environment. It comprises the following departments:

- Department of State Administration in the Section of Water and Fishery
- Department of Water Policy and Energy Resources
- Department of River Basin Management and Flood Protection

The Ministry of Environment is the founder of the following:

- three state enterprises:
 - Slovak Water Management Enterprise, state enterprise , Žilina (SWME),
 - Hydroconsult, state enterprise, Bratislava (HYCO),
 - Water Management Construction, state enterprise, Bratislava (WMC),
- two government-subsidized organizations:
 - Water Research Institute Bratislava (WRI),
 - Slovak Hydrometeorological Institute (SHMI)
- execution of state administration by Slovak Environmental Inspection, Regional Environmental Authorities and District Environmental Authorities in the field of water, public water supply and public sewerage, as well as fisheries and flood protection

Slovak Water Management Enterprise, state enterprise, Žilina

The Slovak Water Management Enterprise is a public enterprise established in 1997 based on property of former river basin state enterprises. Its organizational arrangement follows the existence of natural hydrological basins of Slovakia. It is an administrator of major rivers, majority of small water courses and water structures as well as administrator of river basins in the Slovak Republic. Its main activities are aimed at administration and protection of surface and ground water, comprehensive hydro-ecological activities in river basins and providing mainly the following actions:

- management of rivers and their functions, legislation related to management of water courses and water structures,
- activities related to management of transboundary rivers,
- flood protection and related actions,
- surface water supply, including water use for power generation,
- development, operation and maintenance of waterways, development of conditions for navigation on rivers and reservoirs ,
- monitoring and assessment of surface water body quality and quantity.

Hydroconsult, state enterprise, Bratislava

Hydroconsult (HYCO) is a design-engineering and advisory organization providing design, engineering, consulting and advisory services related to hydraulic structures.

Water Management Constructions, state enterprise, Bratislava

It is an investment-engineering organization performing investment-engineering activities and providing technical assistance to investors in investment construction. It performs design services and technical-safety supervision according to special regulations.

Water Research Institute, Bratislava

It is the only organization in Slovakia conducting complex water management research and other related activities resulting from the needs of the Slovak water management.

The main priorities of the WRI research and development activities result from its multifunctional position regarding creation and protection of environment, public health protection as well as social aspects of water which is essential, irreplaceable, natural and renewable resource used in production processes.

Slovak Hydrometeorological Institute

Slovak Hydrometeorological Institute (SHMI) is an expert organization with a national scope providing hydrological and meteorological services as well as other hydrological and meteorological activities including timely, comprehensive operative and regime information concerning water quality and quantity and air quality. It conducts comprehensive operational, research – development and international activities in the field of monitoring and assessment of surface water and groundwater including Hydrological Information and Forecast Services. SHMI also manages the Sub-Monitoring System Centre - Water.

Other Organizations

Specialized State Authorities

The state water authorities include the Ministry of Environment of the Slovak Republic, 8 regional environmental offices, 46 local environmental offices, Slovak Environmental Inspection and municipalities.

The state authorities activities in individual sections of the state administration are mainly aimed at decision-making, control and supervisory activities in compliance with applicable legislation

The assessment of the activities of regional environmental offices and their subordinate district environmental offices is included in the 2008 Annual Reports of regional environmental offices.

Slovak Environmental Inspection, Bratislava

Department of Water Protection Inspection

The scope and aim of the Water Protection Inspection control activities are defined under the Act No. 364/2004 Coll. on waters (Water Act) in effect as of July 1, 2004. In addition to control activity it also approves emergency plans, identifies causes of accidental water deterioration and manages activities dealing with its elimination, and manages the operation of the International Warning Centre in Slovakia. The Slovak Environmental Inspection includes four regional environmental inspectorates.

Slovak Environmental Agency, Banská Bystrica

Slovak Environmental Agency is an expert organization of the Ministry of Environment with a national scope aimed at environmental protection and development of environmental sciences. In the field of waters it coordinates reporting activities related to implementation of relevant EU legal regulations in the Slovak Republic. The Agency implements the projects in the field of restoration and re-naturalization of water courses. Moreover, it prepares expert

opinions on proposed activities and strategic documents that are subject to the assessment of pressures and impacts on environment

State Geological Institute of Dionýz Štúr Bratislava

The State Geological Institute of Dionýz Štúr as a scientific-research institute of the Ministry of Environment is a separate government-subsidized organization conducting geological research and survey of the Slovak territory. The water issues are dealt with especially in the Department of groundwater and geothermal energy.

Special-Interest Associations and Organizations

Association of Employers in Water Management in Slovakia

The Association of Employers in Water Management in Slovakia is a voluntary organization associating legal entities and natural persons employing the people in water management sector. It was established on December 9, 1991 with the primary objective to be a partner of the labour union in collective negotiations. It is a branch organization presenting activities and particularities of water management to general public.

The Association of Employers in Water Management is a legal entity managed by the Assembly of Employers' Representatives. The Assembly elects the chairman and members of the Executive Board and Review Board as well as appoints and recalls the secretary of the Association. The Association comprises working and advisory committees for legislation, social issues, science and technology, promotion as well as editorial board of the Water Management Journal.

Detailed information about the Association is available on the following website: <http://www.svp.sk/hron/media/zzvh/ZZVH-ram.htm>

Slovak Fishery Union, Žilina Council

The Slovak Fishery Union, Žilina Council enforces execution of fishery laws under the provision of Article 4 of the Act No. 139/2002 Coll. on fishery as amended in later regulations.

Association of Water Companies

Association of water companies was established in 2004. In compliance with the Memorandum on Cooperation with the Ministry of Environment of the Slovak Republic it makes an effort to achieve a coordinated process of providing required level of operation of public water supply and sewerage system as well as to create the conditions for development of these activities in the territory of the Slovak Republic under the applicable legislation of the Ministry of Environment of the Slovak Republic as a central body of the state administration in the field of public water supply and sewerage systems.

Activities and responsibilities of legal entities and natural persons in establishing and operating the public water supply and public sewerage systems are defined pursuant to the Act No. 442/2002 Coll. The entities acting according to the requirements of this Act are as follows:

- water companies

- other entities providing drinking water supply and wastewater collection through public water supply and sewerage systems.

Infrastructure property of municipalities is managed by water companies. Municipalities and towns are owners of infrastructure property.

In 2008, there were 14 major water companies in Slovakia:

- 1 – Bratislava Water Company, joint-stock company, Bratislava
- 2 – Trnava Water Company, joint-stock company, Piešťany
- 3 – West Slovakia Water Company, joint-stock company, Nitra
- 4 – Trenčín Water Company, joint-stock company, Trenčín
- 5 – Trenčín Sewage and Water Works, joint-stock company, Trenčín
- 6 – North Slovakia Sewage and Water Works, joint-stock company, Žilina
- 7 – Orava Water Company, joint-stock company, Dolný Kubín
- 8 – Liptov Water Company, joint-stock company, Liptovský Mikuláš
- 9 – Turiec Water Company, joint –stock company, Martin
- 10 – Váh Water Company, joint-stock company, Považská Bystrica
- 11 – Ružomberok Water Company, joint-stock company, Ružomberok
- 12 – Central Slovakia Water Company, joint-stock company, Bratislava
- 13 – East Slovakia Water Company, joint-stock company, Bratislava
- 14 – Podtatranská Water Company, joint-stock company, Poprad

Other entities providing drinking water supply and wastewater collection:

- 1 – Water and Technical Services, Ltd. Hlohovec
- 2 – Komárno Water and Sewage Works, joint-stock company
- 3 – Mondi Business Paper SCP, joint-stock company, Ružomberok
- 4 – Aquaspiš, Ltd., Spišská Nová Ves
- 5 – PreVaK, Ltd., Bratislava

2.2 Development of Selected Indicators of Water Management in Relation to National Economy

In 2008, the revenues of water management amounted to 20,062 million SKK that represents an increase by 1,212 million SKK compared to 2007. In relation to GDP SR of 2,028.4 billion SKK it represents 1.01 %.

SWME Žilina shared 18.8 % of the total revenues, i.e. 3,767 million SKK. The revenues of water companies shared 58.5 % in amount of 11,733 million SKK, i.e. majority of the total revenues. Other water management enterprises generated revenues in amount of 4,562 million SKK which shares 22.7 % of the total revenues in water management.

In 2008 the water management sector reported profit which was influenced mainly by the total income of Water Management Constructions, state enterprise, Bratislava.

The number of employees in water management sector was reduced by 1,414 in 2008. The average salary has increased by 1,699 SKK compared to 2007.

Table no. 2.2.1

Indicator	unit	Year							
		2005		2006		2007		2008	
			index 2005/2004		index 2006/2005		index 2007/2006		index 2008/2007
GDP	billion SKK	1,439.8	108.6	1,636.3	113.6	1,851.8	113.7	2,028.4	109.5
thereof: water management	billion SKK	17.85	114.1	20.17	113.0	18.85	93.5	20.06	106.42
Average number of employees in Slovakia	number in thous.	2,075	95.6	2,301.4	110.9	2,357.4	102.4	1,311.6	55.6
thereof: water management	number	13,247	97.2	13,114	98.9	12,824	97.8	11,410	88.97
Average monthly salary	SKK	17,274	109.2	18,761	108.6	20,146	107.4	21,782	108.1
thereof: water management	SKK	18,404	110.3	20,291	110.2	21,731	107.1	23,430	107.8

Source: Statistic Office SR, Statistic Report on Basic Development Trends in the Slovak Economy in 2005, 2006, 2007, 2008; state enterprises and water companies

2.3 Relation to the State Budget

Capital Transfers (SWME)

Funds for financing the flood protection actions in amount of 300.000 million SKK were allocated in a form of capital transfers to the SWME, Žilina.

In 2008, additional funds were allocated to SWME in amount of 11.700 million SKK. SWME was allowed to transfer funds among investment activities during 2008.

Allocated funds (capital expenditures) were fully invested.

Current Expenditures (SWME)

Allocated funds (current expenditures) in amount of 813.667 million SKK were spent for the following investment activities:

Flood protection (repair and maintenance)	720.197 million SKK
thereof special purpose funds:	
Maintenance of Olšava in Sačurovo, rkm 0.736 – 1.642	0.500 million SKK
Handlová – Mlynský potok - elimination of emergency situation	2.879 million SKK
Dlhá nad Kysucou – Dlhovanka, repair of bank reservoirs	2.500 million SKK
VD Drahovce – Madunice–waterworks revision	0.827 million SKK
VD Drahovce – Madunice – reconstruction of right-bank dike	0.990 million SKK
VS Drahovce – Madunice, elimination of leaks PH reservoir	6.000 million SKK
VS Drahovce –Madunice, elimination of leaks, PH reservoir	4.418 million SKK
Povina – Kysuca, repair of left-bank rupture	2.082 million SKK
Securing activities including wages, salaries, and service incomes	21.470 million SKK
WFD Implementation	10.000 million SKK
Unregulated payments	62.000 million SKK
Total	813.667 million SKK

Capital transfers for government-subsidized organizations

Capital transfers for government-subsidized organizations in 2008 were as follows:

WRI	13.160 million SKK
<u>SHMI</u>	<u>1.500 million SKK</u>
Total	14.660 million SKK

Currents transfers for government-subsidized organizations

Currents transfers for government-subsidized organizations in 2008 were as follows:

WRI	93.690 million SKK
<u>SHMI</u>	<u>77.340 million SKK</u>
Total	171.030 million SKK

In 2008, water management organizations governed directly by the Ministry of Environment spent funds from the state budget in the total amount of 1,311.057 million SKK:

SWME capital transfers	311.700 million SKK
WRI + SHMI capital transfers	14.660 million SKK
SWME current transfers	813.667 million SKK
<u>WRI + SHMI current transfers</u>	<u>171.030 million SKK</u>
Total	1,311.057 million SKK

2.4 Property Structure

Watercourses

Based on more precise digital processing of the river inventory by using qualitatively more precise data in a digital output of the water management maps at M 1:50,000 scale the total length of rivers in Slovakia is 61,147 km.

The Slovak Water Management Enterprise, Žilina has a crucial position in administration of the watercourses in Slovakia pursuant to the Water Act.

The administration of small water courses is provided through the state organisations of forest management, namely, Forests of the Slovak Republic Banská Bystrica, Forest-Agricultural Property Ulič, Military Forests and Properties of the Slovak Republic, Pliešovce. One percent of the total length of Slovak water courses is administrated by other entities while seven percent of their length has no administration authority.

The number of SWME water reservoirs has changed compared to the previous years - SWME Piešťany transferred the administration of 2 reservoirs (Bobrovec and Jamník) to Hydromeliorácie – state enterprise. On the other hand, the Forests of the Slovak Republic transferred administration of water reservoir Hlboká to SWME.

The total number of weirs decreased in 2008 due to removing the Prešov Weir from the inventory of long-term assets.

Development Overview – Water Courses and Hydraulic Structures

Table no. 2.4.1

Indicator	Unit	Years				
		2004	2005	2006	2007	2008
Length of watercourses	km	38,015	38,183	38,211	38,217	38,217
thereof: trained watercourses	km	8,115	8,125	8,199	8,202.5	8,208.9
Major water management rivers and water supply watercourses	km	11,422	11,850	11,850	11,850	11,850
Length of protection dikes	km	3,074	3,127	3,135	3,135.2	3,135.2
Length of artificial channels and feeders	km	42	42	42	67	67
Weirs	number	210	210	216	217	216
Number of navigation locks	number	12	12	12	15	15
Pumping stations	number	70	71	72	72	72
Water reservoirs (total)	number	286	278	278	278	277
thereof: water supply reservoirs	number	8	8	8	8	8
Total capacity of water reservoirs	mil. m ³	1,919	1,908	1,908	1,908	1,908
Dry reservoirs -polders	number	4	14	20	20	20
Historical hydraulic structures	number	23	23	23	23	23

Source: SWME, state enterprise, Žilina – Annual report on administration and operation of watercourses and hydraulic structures, Economic Yearbook

Water Supply and Sewerage Systems

Development Overview – systems in administration of water companies, local authorities and other entities:

Table no. 2.4.2

Indicator	Unit	Years					
		2006	2007	2008			
				WC	LA	Other *	Total
Length of water supply system (without service pipes)	km	26,357	26,899	24,736	1,898	743	27,377
Length of service pipes	km	5,925	6,105	5,393	659	220	6,272
Number of service pipes	units	777,795	792,852	720,598	68,865	23,625	813,079
Length of sewage system (without service pipes)	km	8,016	8,506	7,553	1,466	247	9,266
Length of sewer service pipes	km	2,117	2,203	1,882	475	51	2,408
Number of sewer service pipes	units	275,207	291,457	256,298	61,251	9,366	326,915
Number of WWTPs	No.	499	511	268	290	19	577

* Other entities: KOMVaK Komárno, Water and Technical Services Hlohovec, SCP Ružomberok, Prevak Stará Turá, HBP Prievidza

Source: WRI

3 LEGISLATION IN THE WATER MANAGEMENT

3.1 Legislation

Legislation in 2008 was aimed at meeting the obligations towards the EU related to new European water legislation adopted in 2006 and 2007 and at introducing common European currency – euro in the Slovak Republic. In connection with this the following legal regulation were developed:

- *Draft Bill amending the Water Act No. 364/2004 and on amendments to the Act of the Slovak National Council No. 372/1990 on offences as amended in later regulations (Water Act), to which the Directive of the EU Parliament and of the Council 2006//118/EEC of December 12, 2006 on the protection of groundwater against pollution and deterioration and partially the Directive of the EU Parliament and of the Council 2006/7/EC of February 15, 2006 concerning the management of bathing water quality and repealing Directive 76/160 ECC are transposed.*

The Draft Bill includes the requirements of the Call of the European Commission 2007/2247 for transposing the Directive of the European Parliament and of the Council 2000/60/EC of October 23, 2000 establishing a framework for community actions in the field of water policy to the legislation of the Slovak Republic of October 16, 2008.

- *Draft Bill on flood protection* which transposed the Directive of the European Parliament and of the Council 2007/60/EC on the assessment and management of flood risk.
- *Draft Bill amending the Act 442/2002 on public water supply and public sewerage and on amendments to the Act 276/2001 on regulation in network industries as amended in later regulations* – the purpose of the Draft Bill is to eliminate technical and formal shortcomings of particular provisions, to amend the sanctions against entities for failing to meet the obligations under the Act.
- *Draft of the Regulation of the Government of the Slovak Republic 755/2004 establishing the amount of non-regulated payments, fees and details related to charging the use of water* – introduction of euro currency in the Slovak Republic. Draft Regulation was approved on August 27, 2008 under the number 367

3.2 Standardization

The WRI Department of Standardization and Informatics for Water Management of the Water Research Institute and SHMI Hydrological Standardization Centre deal with the technical standardization in water management sector and cooperation with international and European standardization organizations.

Standardization for water management sector of the Slovak Republic is conducted in the following technical committees (TC):

- TC 1 Water Supply and Sewerage Systems
- TC 27 Water quality and protection
- TC 64 Hydrology and Meteorology
- TC 72 Environmental management

The list of Slovak Technical Standards for water management sector is available on the WRI website: <http://www.vuvh.sk/>.

The Slovak Institute for Technical Standardization is a member of the international and European standardization structures. Slovakia is a member of the International Organization for Standardization (ISO) and the European Committee for Standardization (CEN). It is obliged to comment on all draft standards and working papers.

The WRI Department of Standardization and Informatics for Water Management is authorized by the Slovak Institute for Technical Standardization to cooperate with the international standardization committees:

- ISO/TC 147 Water quality
- ISO/TC 224 Services concerning the drinking water supply and sewerage systems – quality criteria of services and operation indicators

and European standardization committees:

- CEN/TC 164 Water supply
- CEN/TC 165 Wastewater technology
- CEN/TC 230 Water analysis
- CEN/TC 308 Sludge characteristics

International cooperation in European Standardization Committee CEN/TC 318 Hydrometry is provided through the representative of the SHMI Hydrological Standardization Centre.

Membership in these organizations allows Slovakia to actively participate in development of the European standards and enforce the national interests in this field.

4 WATER FRAMEWORK DIRECTIVE IMPLEMENTATION

4.1 WFD Implementation Strategy in Terms of Reporting Obligations Towards the European Commission

In 2008, the WFD implementation process ran in compliance with the *Time Schedule of Activities for Development of River Basin Management Plans* and approved *Strategy for WFD Implementation*, which fully complies with the strategy of the European Commission and International Commission for the Protection of the Danube River. The core of activities was aimed at preparation of the 1st version of the river basin management plans including the programmes of measures and publication of the proposals for comments, active participation and consultations with public. For this purpose the activities were focused mainly on the following key actions:

- *assessment of surface water body ecological status* – it is very important step of the WFD implementation process, which provides an overview of ecological status of surface water bodies in terms of new approaches and principles. The assessment of water bodies will reflect the degree of improvement after taking the appropriate measures. This process involves participation of WRI experts and other organizations of the Ministry of Environment as well as experts from universities, academies and private sector;
- *assessment of surface water body chemical status* – in 2008, a procedure for indicative assessment of surface water bodies chemical status was completed including priority substances and other pollutants (according to Annex X, WFD and Directive 2006/0129 (COD) in final version). Environmental quality standards were proposed and subsequent assessments were carried out for these substances;

-
- *assessment of quantitative and chemical status of groundwater bodies* – in 2008, national methodologies were developed and following assessment of quantitative and chemical status of groundwater bodies was performed. The process also includes the determination of background levels and threshold values of pollutants and pollution parameters in groundwater;
 - *completion of the document* – “*A Preliminary Overview of Identified Main Water Management Problems*”. This document was submitted to public for comments in accordance with the Article 14 WFD and § 13 of the Act 364/2004. The resulting document „*Identification of Main Water Management Problems*” was developed based on comments evaluation. It is significant step in the process of river basin management plans development, since this document serves as a basis for a proposal of the programme of measures;
 - *Continuation in testing the so-called candidates for heavily modified and artificial water bodies (HMWB and AWB)*. In 2008, the testing of „HMWB and AWB candidates“ was finished on large and medium rivers of Slovakia. In the aggregate, 104 HMWB and AWB candidates were tested - 16 water bodies were definitively identified as HMWB and 4 as AWB. Restoration/mitigation measures to eliminate adverse effect on water status were taken within the testing process and their ecological efficiency together with cost-effectiveness were evaluated. For solving the problem related to identification of maximum and good ecological potential for HMWB and AWB, so-called „emergency solution to derive MEP/GEP for HMWB and AWB in 2008“ was adopted. Based on this solution, MEP/GEP were identified using expert estimation;
 - *development of the programme of measures*. Programme of measures is proposed in relation to the objectives by 2015 which are set at national level and level of international Danube river basin within the structure corresponding with determined water management problems (organic pollution of surface waters, nutrient pollution of surface waters, pollution of waters by priority substances and substances relevant for Slovakia, hydromorphological changes and problems related to groundwater quality and quantity). The programme of measures also includes an estimation whether the objectives set for particular water management problems will be achieved by 2015. Subsequently the steps are defined for further planning cycle and feedback between international and national levels. In case particular objectives are not achieved by 2015, it will be necessary to propose further measures;
 - *dealing with the tasks of economic analysis* – relevant activities followed the work done in the previous years and were focused on two main sets of problems – „Economic analysis of water use“ and „Assessment of water services cost effectiveness“

The data for 2005, 2006 documenting the significance of main types of water uses through parameters were updated within the Economic analysis of water use. The data were collected according to characteristics required under the methodological documents for WFD economic analysis.

For the need of the *Assessment of water services cost effectiveness*, a deep analysis of the present state of water management services related to use of rivers was carried out in 2008. These water services are provided by SWME Žilina, the administrator of major water courses. The analysis covers the utilization of hydro-energetic potential, use of energetic water and surface water abstraction from the viewpoint of funding these activities and covering the costs. Fees and charges for these services are regulated by the Office for Regulation of Network Industries.

Other activities were aimed at implementation of the Article 9 WFD which states that all EU countries shall take account of the principle of recovery of the costs for water services. According to the Article 9 WFD, Member States are obliged to deliver by 2010 water pricing policy that provides adequate contribution of different water uses to the recovery of these water management service. For that purpose the proposal of financial mechanism providing the recovery of cost was developed.

Further actions were aimed at coordination and development of the 1st version of the river basin management plans. RBMP structure was developed in compliance with requirements under the Article 13, Annex 7 WFD and related documents at the EC and ICPDR levels. Moreover, the outputs of the tasks summarized in the EC report of the Slovak Republic were updated and completed in accordance with Article 3, Annex 1, WFD together with the outputs of subtasks in accordance with Article 5, Annex 2 and 3, WFD and Article 6, Annex 4.

Activities at the ICPDR level were also carried out in 2008. These were aimed at preparation of international Danube river basin management plan and simultaneously, the development of international Tisa river basin management plan continued.

4.2 Implementation of Other EU Directives related to Water

In 2008, the implementation of 26 EU directives and regulations together with reporting to EC on the process of their implementation was in the competence of the Ministry of Environment SR. The exceptions include the Directive 2006/7/EC concerning the management of bathing water quality and repealing the Directive 76/160/EC, and the Council Directive 98/83/EC on the quality of water intended for human consumption which are in the competence of the Ministry of Health SR.

Compared to 2007 the Ministry of Environment SR became responsible for implementation of the Directive of the European Parliament and of the Council 2008/105/EC of December 16, 2008 on environmental quality standards in the field of water policy amending and subsequently repealing Council Directives 82/176/EEC, 83/513/EEC, 84/156/EEC, 84/491/EEC and 86/280/EEC and amending Directive of the European Parliament and of the Council 2000/60/EC.

There was an effort to perform activities in order to meet the requirements of the implementation programmes for particular directives. However, it was not possible in all cases. Execution of the Implementation programmes depends on several factors and some

of them (for example lack of funds, missing databases, insufficient level of water quality and quantity monitoring) have very negative effect on performing these actions.

The Slovak Republic is responsible in accordance with EU regulations for reporting to EC on the progress of implementation of particular directives/regulations. The Ministry of Environment SR submitted within the "Chapter Water" the following reports to EC in 2008: (available on the website: www.sazp.sk):

- Situation Report on Urban Wastewater and Sludge Disposal in the Slovak Republic for 2005 - 2006 (March 2008)
- National Programme of the Slovak Republic of June 2008 on execution of the Directive of the European Council 91/271/EEC concerning urban wastewater treatment as amended in the Directive of the European Commission 98/15/EC and Regulation of the European Parliament and of the Council 1882/2003/EC
- Report on Implementation of the Directive 91/676/EEC concerning the protection of water against pollution caused by nitrates from agricultural sources in the Slovak Republic, 2008

The following reports were submitted to EC within the "Chapter Environment":

- Register of waters suitable for bathing and swimming in Slovakia for 2008
- Report of the Slovak Republic on the quality of water intended for bathing and swimming in 2008 developed based on the Article 13 of the Council Directive 2006/7/EC on the management of bathing water quality and repealing Directive 76/160/EC.

The above-mentioned reports are available to public on <http://www.sazp.sk/> and on the official website of the European Environmental Agency, i.e. in the Central Data Repository of EIONET (*Environmental Information and Observation Network*): <http://cdr.eionet.europa.eu/sk/eu>.

Further responsibility of the Ministry of Environment SR was to report to the European Environmental Agency (EEA) the following data: Groundwater quality (EWN - 3), Lake quality (EWN - 2), River quality (EWN - 1) and Water Quantity.

4.3 Projects for Implementation of Directives Financed by EU Funds

In 2008, the expenditures of the projects in amount of 2,126.203 million SKK (70.577 mil. €) were funded by the structural funds within the Operational Programme: Basic Infrastructure, Provision 2.1. EU finances were in amount of 1,649.850 million SKK (54.765 mil. €) and co-financing through the state budget was amounted to 476.352 million SKK (15.812 mil. €).

Detailed budget breakdown is shown in the following table:

[in million SKK]

Table 4.3.1

		ERDF	State budget	Total
Drinking water	Water companies	356.722	91.372	448.094
	municipalities	49.828	24.703	74.532
	total	406.550	116.075	522.626
Sewerage and WWTPs	Water companies	678.980	52.028	731.007
	Municipalities	371.755	134.904	506.659
	total	1,050.735	186.932	1,237.666
Flood protection measures	SWME	192.565	173.345	365.910
Total [in million SKK]		1,649.850	476.352	2,126.203
Total [in million €]		54.765	15.812	70.577

In 2008, 24 projects were funded from the ISPA Fund in amount of 8,113.655 million SKK (269.324 mil. €). EU finances were in amount of 4,662.390 million SKK (154.763 mil. €) and co-financing through the state budget was amounted to 1,935.294 million SKK (64.240 mil. €).

The Cohesion Fund allocated 3,308.922 million SKK (109,836 mil. €). for 7 projects in 2008.

5 INTERNATIONAL COOPERATION IN WATER MANAGEMENT

In 2008, international cooperation continued under the intergovernmental agreements, international treaty and international conventions signed in the previous years.

The following documents are in the process of preparation or ratification:

- Agreement between Slovakia and Austria on cooperation in management of transboundary waters.
- Convention on Protection and Use of Transboundary Rivers and International Lakes UN Economic Commission for Europe (Helsinki Convention).
- *Convention on Cooperation in Protection and Sustainable Use of the Danube River*. The International Commission for the Protection of the Danube River (ICPDR) within this Convention. The Ministry of Environment of the Slovak Republic is a member of this Commission
- Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention).

International Cooperation within the Committees on Transboundary Waters

Hydrological and hydraulic research continued in 2008 within the Committees on Transboundary Waters in cooperation with the technical group for the Danube River..

Transboundary Rivers with Austria

In accordance with the decision of the Slovak-Austrian CTW, joint monitoring of water quality continued in 2008. Hydrological experts of both countries carried out eighteen measurements of discharge in the Morava River at cross section of Moravský Svätý Ján – Hohenau an der March and cross section Záhorská Ves – Angern an der March.

For assessment of new flood level values on boundary stretches of the Danube and Morava rivers the approval procedure of calculated water levels is carried out and its completion is expected in 2009.

In 2008 bilateral cooperation related to restoration measures in stream channel, side river branches and floodplain at boundary stretch of the Morava River continued. The objective of the project is to agree on the joint plan of measures (as a basis for implementation of further measures under WFD) for recovery of natural river function, increase in biodiversity and improvement of wetland ecosystem at the relevant stretch of the Morava River.

Slovak partner developed a proposal of the River Basin Management Plan for the Slovak Republic, which was submitted to public for comments. Its finalization is expected on December 22, 2009.

Transboundary Rivers with Hungary

In 2008, joint water quality monitoring continued at the Slovak-Hungarian stretches of Danube and Ipeľ rivers and other Danube tributaries (Bratislava – Budapest) in connection with the construction of the Gabčíkovo Waterworks. Water quality monitoring in transboundary rivers was carried out by the WRI and SWME experts. They provided water sampling and water analyses in cooperation with the Hungarian partner.

In 2008 the discussion on the Gabčíkovo-Nagymaros Waterworks continued at the level of the Slovak and Hungarian Government delegations. The talks were aimed at signing the agreement concerning the way of execution of the Judgment of the International Court of Justice in Hague with respect to the matter related to the Gabčíkovo-Nagymaros Waterworks of September 25, 1997. Due to fundamental differences in the approaches of both parties it was not possible to come to a definitive agreement.

Partial result is an agreement of both delegations on performance of the following tasks:

- strategic assessment of the effect of measures and solutions proposed by both partners on environment of the Danube River at the stretch of river between Bratislava and Budapest,
- monitoring of environment of the Danube River at the stretch between Sap and Budapest according to the principles of the Agreement between the Government of the Slovak Republic and the Government of Hungary of 1995.

Both partners started with the Strategic Environmental Assessment (SEA). It is expected that the agreed deadline for SEA (end of 2009) will be extended by the end of 2010. Both partners have exchanged initial data required for monitoring of the stretch of the Danube River between Sap and Budapest.

Monitoring on the Slovak territory is still in process and the results indicate positive effect of the Gabčíkovo Waterworks on environment of adjacent area. The results of monitoring were discussed at international conference.

Due to agreed amount of water flowing into the old channel of the Danube River (under Agreement of 1995) the river banks and gravel bars began to overgrow by vegetation. This led to decreased flow capacity of the river channel and floodplain. Training of the old channel of the Danube River had to be carried out by the Hungarian partner in accordance with the Agreement of 1977. Today, the discussion of both partners on possible solutions for the relevant river channel is going on. The attention is paid mainly to flood protection of this area.

Two working groups are established within the Slovak-Hungarian Committee on Transboundary Waters to deal with the water management problems related to the Ipeľ River:

- Working group for Ipeľ River,
- Joint working group of technical experts for hydrology.

Both working groups cooperate on hydrological and hydraulic research.

The Committee approved joint plan of actions for 2008. In addition, it approved the project documentation for three bridges across Ipeľ in the localities of Szécsény-Pösténypuszta-Peťov and Rárospuszta-Raroš. Building permits have already been issued for two bridges in Pösténypuszta-Peťov and Rárospuszta-Raroš.

Since 2006 working group has been managing the international project within INTEREG together with construction of fish passes and restoration of dead river channels of Ipeľ in the locality of Malé Kosihy – Ipeľský Sokolec. Common operating instructions were approved in 2008.

Furthermore, the project „Concept of Flood Protection in the Ipeľ River Basin“ is being developed in cooperation with the Working Group for Hydrology.

Transboundary Rivers with Poland

Cooperation with Poland in the field of hydrology continues according to agreed plan of activities. Automatic hydrological devices installed at gauging stations within the project POVAPSYS are in operation. Data transfer in the Orava River Basin runs according to the plan..

The projects „Flood Warning and Forecasting System of the Slovak Republic“ and „Monitoring System and System of Area Flood Protection“ are in permanent operation.

Both parties completed national methodologies related to classification of water bodies and methodologies for derivation of reference conditions and classification schemes for ecological status and chemical status of water within the WFD implementation strategy.

Assessment of surface water quality and quantity under WFD is legally regulated in Poland in accordance with the Regulation of the Ministry of Environment of August 20, 2008. Similar legal regulation is also necessary in Slovakia.

Both parties communicate their new materials and updates to existing documents which are available on national websites related to WFD implementation.

In October 2008, Poland submitted the application for the project „Development of Information System PLUSK for Slovak-Polish Transboundary Waters“ within the Programme of Slovak-Polish Transboundary Cooperation 2007 – 2013.

Transboundary Rivers with Ukraine

Planned reconstruction of right-bank dike of the Tisa River continued in 2008. International cooperation took place within working groups for WFD implementation.

International Projects

The most important projects in the field of water management in 2008 were as follows:

- Water Management Balance of the Danube River Basin with respect to the Concept of Sustainable Use;
- Bilateral Project Morava – joint management of water management and hydroecological measures (Slovakia – Austria). The project was completed in 2008;
- Initial Study of the Project – Improving the Danube River Navigability (Hungary – Slovakia);
- NORMAN – Network of Reference Laboratories and Partner Organizations for Monitoring and Bio-Monitoring of Pollutants Posing Risk to Environment. The project was completed in November 2008.;
- SOCOPSE – development of control system in Europe – it is related to support of WFD implementation process by using the directives and supporting tools for decision making in management of priority pollutants;
- Development of the Joint Landscape and Water Management Concept and Assessment of Conditions for its Implementation and Planning of Individual Elements of the Concept in the locality of Medzibodrožie – INTERREG III A. The project was completed in 2008;
- Zemplín Waterway (Interreg IIIA);
- DINAMICS – the project is aimed at development of biological nanosensors capable to detect pathogenic microorganisms in aquatic environment;
- CAPACITY BUILDING SUPPORT TO THE WATER SECTOR IN TURKEY, TR 06 IB EN 01;
- DANewBE Data (Digitally Advanced New Cross-Border Exchange of Data) which is an integrated part of INTERREG III B Project;
- Improvement of flood management and flood protection plans for the Hornád River Basin in the territory of Slovakia;
- Development of the contact system among the institutions in accordance with the international agreements on transboundary waters funded within the Programme of Transboundary Cooperation SR-MR 2007-2013 – preparation of basic documents for submitting the application form;
- UNDP – Integration of the principles and practices of ecological management into the landscape and water management in the Laborec-Uh Region (East Slovakia Lowland);
- Project WACO – cooperation with the Dutch experts from the Water Board Regge and Dinkel;
- Twinning project SK05/IB/EN-01 “Determination of EQS for water, and building capacity for regional and district environmental offices in implementation of water control and monitoring systems;
- MOSES – Improvement of Flood Protection System;
- FLOODMED co-financed by EU within the INTERREG CADSES IIIB Initiative; completed in 2008;
- HYDROCARE co-financed by EU within the INTERREG CADSES IIIB Initiative; completed in 2008;
- ClimateWater – overcoming the gap between adaptation strategies for climate change impacts and European water policy;

– HSAF – satellite applications for hydrology funded by EUMETSAT.

6 DESCRIPTION OF NATURAL CONDITIONS IN THE FIELD OF WATER AND WATER MANAGEMENT

6.1 Natural Conditions

The Slovak Republic is situated in the Central Europe. It borders on Austria, Czech Republic, Poland, Ukraine and Hungary.

The most of the territory is a part of the West Carpathians Mountain System and only the outmost northeast part belongs to the East Carpathians. The territory is included in the Carpathian Ecoregion. Lowlands cover almost one fourth of the territory - Vienna basin from the north, Panonian Basin from the southwest and Great Danube Basin from the south-east. All these form a part of the Hungarian Lowland.

Maximum vertical dissection - energy of the relief expressed as a difference between maximum and minimum altitude is given by the value of 2,655 meters above sea level (Gerlachovský štít) - 94 meters above sea level (Bodrog - state border) = 2,561 meters.

Climate Conditions

The total precipitation in the Slovak territory for 2008 reached 817 mm which represents 107 percent of average conditions. The year 2008 is considered as an average year regarding precipitation. Monthly rainfall totals for 2008 are shown in table no. 6.1.1.

Average rainfall in Slovakia for 2008

Table no. 6.1.1

Month	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Year
mm	51	27	74	57	60	85	165	66	56	52	46	80	817
% of average	110	64	157	103	79	99	183	81	89	85	74	152	107
Excess (+) Deficit (-)	+5	-15	+27	+2	-16	-1	+75	-15	-7	-9	-16	+27	55
Description of precipitation period	R	VD	EW	R	VD	R	EW	D	D	D	WD	EW	R

Notice: ED – extremely dry, VD- very dry, D – dry, R- regular, W - wet, VW – very wet, EW – extremely wet

Rainfall totals for 2008 in individual river basin districts of Slovakia are shown in table 6.1.2. Following the precipitation period characteristics, the river basins of Hron, Bodrog, Poprad and Dunajec can be considered as wet and Hornád river basins as very wet. Most of other sub-basins were considered as regular regarding rainfall totals for 2008.

Average rainfall totals per river basin in Slovakia for 2008

Table no. 6.1.2

River Basin District	Sub-Basin	Area [km ²]	Average Rainfall [mm]	% of average	Precipitation Period Characteristics
Danube	Morava*	2,282	663	97	R
	Danube*	1,138	600	96	R
	Váh	14,268	851	101	R
	Nitra	4,501	689	99	R
	Hron	5,465	872	111	W
	Ipeľ*	3,649	745	109	R

River Basin District	Sub-Basin	Area [km ²]	Average Rainfall [mm]	% of average	Precipitation Period Characteristics
Danube	Slaná	3,217	812	103	R
	Bodrog*	7,272	847	120	W
	Bodva	858	737	101	R
	Hornád	4,414	856	126	VW
Dunajec and Poprad	Dunajec and Poprad	1,950	981	117	W
Slovakia		49,014	817	107	R

*only Slovak part of river basin

Notice: R- regular, W - wet, VW – very wet

Hydrological Conditions

The geographic location of Slovakia on a watershed divide of the Black Sea and Baltic Sea (watershed divide passes along the Slovak- Polish state border and at the stretch between Štrba and Čirč it passes over the Slovak territory) along with natural conditions predetermines the situation of water management in our country. Water from 96 % of the Slovak territory flows through the Danube and Tisa into the Black Sea, while the remaining 4 % flows through the Vistula River tributaries into the Baltic Sea. The streams rising in our territory are rather unstable. High discharges occur regularly in spring from March to April (on Danube, Poprad and Dunajec rivers approximately 2 months later). Low discharges are observed during the summer and autumn periods.

A density of the river system varies from 0.1 km.km⁻² in the karst plains up to 3.4 km.km⁻² in paleogennic rocks of the flysch mountains. An average density of the river system is characterized by the value of 1.1 km.km⁻².

Water Resources in 2008

In 2008 the average annual runoff from the Slovak territory was 208 mm, which is 79 % of the long-term average. The runoff in individual river basins was in the range from 22 mm (Danube sub-basins) to 419 mm (Poprad and Dunajec sub-basins). The lowest runoff was recorded in the Ipeľ River Basin (28 %) while the highest runoff was in the Dunajec and Poprad river basins (96 %). The values of annual runoff for each river basin are shown in table 6.1.3. The water balance data for 2008 are shown in table no. 6.1.4.

Average annual runoff for each river basin of Slovakia in 2008 Table no. 6.1.3

River basin district	Sub-basin	Area of river basin [km ²]	Annual runoff [mm]	% of normal
Danube	Morava*	2,282	94	71
	Dunaj*	1,138	22	61
	Váh	14,268	259	83
	Nitra	4,501	105	73
	Hron	5,465	216	75
	Ipeľ *	3,649	68	50
	Slaná	3,217	140	74
	Bodrog*	7,272	219	74
	Bodva	858	86	52
	Hornád	4,414	319	72

River basin district	Sub-basin	Area of river basin [km ²]	Annual runoff [mm]	% of normal
Dunajec and Poprad	Dunajec and Poprad	1,950	416	96
Slovakia		49,014	208	79

* Slovak part of river basin

Total water balance of water resources in Slovakia Table no. 6.1.4

Balance	Volume [mil. m ³]
	2008
<i>Hydrological balance:</i>	
Rainfall	40 049,000
Annual inflow to Slovakia	69 005,000
Annual runoff	73 387,000
Annual runoff from the Slovak territory	10 146,000
<i>Water management balance:</i>	
Total intakes (Slovakia)	664,593
Vapour from water reservoirs	51,900
Discharge into surface water	608,900
Effect of water reservoirs (WR)	12,600
Accumulation	
Total water supply in WR as of January 1 of the following year	809,40
% of storage capacity in accumulation water reservoirs	70,00
Water use rate (%)	6,55

Assessment of Groundwater Regime in the Hydrological Year 2008

In 2008 the highest values of groundwater levels and well capacities were recorded in the period from July to October when the effect of above-average rainfall totals led to rise of groundwater levels with maximum annual values. In the Morava, Nitra and Hron river basins the maximum groundwater levels are recorded in spring (March –May). The maximum well capacity was observed in the period from March to July but also in November. In the regions situated at higher altitude, maximum well capacity influenced by storm rainfalls was recorded during the summer season in July and August, respectively. However, most of maximum well capacity values were recorded in March - May. Minimum groundwater levels were observed during winter period from September to December and minimum well capacities were recorded in September and October..

A decrease of *average annual groundwater levels* to – 40 cm was recorded mainly in the river basin of Hron, middle and upper Váh and Bodrog. On the contrary, rise of average groundwater levels to + 40 cm occur in the river basins of Morava, Danube, lower Váh, Latorica, Laborec and Ondava..

An increase in average annual well capacity up to 140 % of the previous year was observed in the river basins of Hron, Slaná, Bodva, Poprad, Hornád and Bodrog. Decrease in average annual well capacity (from 80 to 95 %) was recorded in the Váh and Nitra river

basins. The values in remaining river basins were in the range from 80 to 120 % compared to 2007.

Surface Water Quality

The Slovak Hydrometeorological Institute conducts an assessment of surface water quality of the national river monitoring system based on the results of water analyses (basic physical-chemical parameters, biological parameters, micro-biological parameters, organic and inorganic micro-pollutants and in selected areas also radioactivity parameters) carried out in SWME laboratories (physical-chemical water analyses) and WRI laboratories (biological analyses, analyses of specific organic substances and all analyses of samples from transboundary rivers with Austria, Hungary, Poland and Ukraine).

The results are processed under the Regulation of the Slovak Government 296/2005 specifying the requirements on surface water quality, surface water quality objectives, and limit values for wastewater and special water pollution parameters. The previous 24-month period 2007 - 2008 was assessed.

Pursuant to the Decree No. 221/2005, water quality monitoring was classified into the following categories: basic monitoring, operational monitoring and monitoring of protected areas. Surface water quality was monitored in compliance with the Water Quality and Quantity Monitoring Programme 2008-2010. In the aggregate, the monitoring was done at 314 sampling sites. Basic monitoring was carried out at 171 sampling sites and operational monitoring at 203 sampling sites. A part of sampling sites was monitored for several purposes to minimize costs.

Basic monitoring network includes 171 sampling sites where 35 of them were monitored within the verification of water bodies characterization process, 68 within the monitoring of reference conditions, 38 within the monitoring of transboundary waters, 75 within the description of types of water courses and 9 sampling sites were monitored for ICPDR (table 6.1.5).

Number of surface water sampling sites in the basic monitoring network Table no. 6.1.5

Purpose of monitoring	Sub-basin				Total number of sampling sites for a given purpose
	Danube	Váh	Hron	Bodrog, Hornád, Poprad and Dunajec	
Verification of water body characterization	11	5	5	14	35
Reference sites	4	22	16	26	68
Transboundary waters	17	3	4	14	38
Type of watercourse	10	21	20	24	75
ICPDR	6	1	2	0	9
Total	48	52	47	78	225

Notice: some sampling sites were monitored for several purposes

In 2008, the monitoring frequency for each parameter varied in the range from 1 to 24 times. Parameters with lower frequency of monitoring include biological parameters, heavy

metals and specific organic pollutants. Priority substances are monitored 12 times a year. Fish species were not monitored in this year.

At present, the approach to assessment of surface water quality is being changed under the WFD requirements. Recently, the surface water quality was assessed under the Slovak Technical Standard 75 7221 - Water Quality - Surface Water Quality Classification. This standard was repealed on March 1, 2007.

In this transition period, the parameters shown in the table 6.1.6. are categorized under the Regulation of the Slovak Government 296/2005 specifying the requirements on surface water quality and quality objectives for surface water and limit values of wastewater and special water pollution parameters.

The requirements under the Regulation 296/2005 have been fully met in some physical-chemical parameters: TOC, calcium, sulphates; for micropollutants: cyanides, lead, nickel, selenium and some specific organic substances. The limit values for chloroform and nitrite nitrogen were frequently exceeded. Concerning microbiological parameters, the limit values for faecal streptococci, thermotolerant coliform bacteria and coliform bacteria were frequently exceeded. Tetrachloromethane, 1,1,2-trichloroethylene and cis 1,2-dichloroethene were not evaluated since their determination values are higher than the limit under the Regulation 296/2005.

Evaluation of Surface Water Quality Parameters Monitored under the Regulation 296/2005 for 2007 – 2008

Table no. 6.1.6

Parameter	Unit	Total number of monitored sampling sites	Number of monitored sampling sites in accordance with the Regulation 296/2005	% meeting the requirements of the Regulation 296/2005
Dissolved Oxygen	mg/l	219	199	91
COD Mn	mg/l	39	37	95
COD Cr	mg/l	219	168	77
Total Organic Carbon	mg/l	22	22	100
BOD with nitrification inhibition	mg/l	204	186	91
Free Ammonia	mg/l	63	62	98
Water Reaction		219	200	91
Water Temperature	°C	219	217	99
Dissolved Solids	mg/l	49	43	88
Total Iron	mg/l	27	20	74
Total Manganese	mg/l	24	17	71
Ammonium Nitrogen	mg/l	219	189	86
Nitrite Nitrogen	mg/l	219	37	17
Nitrate Nitrogen	mg/l	219	205	94
Organic Nitrogen	mg/l	32	27	84
Total Phosphorus	mg/l	210	167	80

Parameter	Unit	Total number of monitored sampling sites	Number of monitored sampling sites in accordance with the Regulation 296/2005	% meeting the requirements of the Regulation 296/2005
Total Nitrogen	mg/l	219	208	95
Dissolved solids - ignited	mg/l	37	33	89
Chlorides	mg/l	219	212	97
Sulphates	mg/l	217	217	100
Calcium	mg/l	215	213	99
Magnesium	mg/l	215	213	99
Phenols - volatile	mg/l	77	63	82
Anion Tensides	mg/l	39	36	92
Non-polar extractable substances -UV	mg/l	73	58	79
Total Cyanides	mg/l	14	14	100
Active chlorine	mg/l	38	34	89
Mercury	µg/l	18	13	72
Cadmium	µg/l	15	14	93
Lead	µg/l	11	11	100
Arsenic	µg/l	9	7	78
Copper	µg/l	14	12	86
Total chrome	µg/l	9	8	89
Nickel	µg/l	7	7	100
Zinc	µg/l	12	8	67
Selenium	µg/l	1	1	100
Aluminium	µg/l	1	0	0
Saprobic Index of Bioseston		44	32	73
Coliform Bacteria	KTJ/ml	52	21	40
Thermotolerant Coliform Bacteria	KTJ/ml	44	10	23
Faecal Streptococci	KTJ/ml	46	11	24
Chlorophyll a	µg/l	44	37	84
Producers in 1 ml(aut.org.)	No./1ml	21	12	57
Abundance of phytoplankton	No./1ml	15	11	73
Total volume alpha activity	mBq/l	12	10	83
Total volume beta activity	mBq/l	15	14	93
Radium 226	mBq/l	13	13	100
Tritium	Bq/l	15	15	100
Absorbed organic halogens	µg/l	31	8	26
Pentachlorophenol	µg/l	38	38	100
Benzene	µg/l	43	43	100

Parameter	Unit	Total number of monitored sampling sites	Number of monitored sampling sites in accordance with the Regulation 296/2005	% meeting the requirements of the Regulation 296/2005
Toluene	µg/l	45	45	100
1,3-Dichlorobenzene	µg/l	43	43	100
1,4-Dichlorobenzene	µg/l	53	53	100
1,2-Dichlorobenzene	µg/l	53	53	100
Xylene (Sum)	µg/l	55	55	100
Chloroform	µg/l	51	3	6
1,2-Dichloroethane	µg/l	51	48	94
Tetrachloromethane	µg/l	41	Not evaluated	
1,1,2-Trichloroethylene	µg/l	41	Not evaluated	
1,1,2,2-Tetrachloroethylene	µg/l	51	51	100
Cis 1,2 - dichloroethene	µg/l	41	Not evaluated	
Benzo(a)pyrene	µg/l	62	62	100
Fluoranthene	µg/l	62	59	95
Naphthalene	µg/l	62	62	100
Hexachlorobenzene	µg/l	63	63	100
Lindane	µg/l	64	64	100
1,2,4-trichlorobenzene	µg/l	55	55	100

6.2 River Basin Districts

The territory of Slovakia is a part of the Danube and Vistula River Basins which include sub-basins defined according to natural hydrological boundaries and associated hydrogeological zones specified as areas with similar hydrogeological conditions, aquifer types and groundwater cycle.

Division of Water Resources

Water resources of Slovakia are divided under the WFD requirements into the hydrological and administrative units – river basins, river basin districts and water bodies. Waters in the Slovak territory are included in two international river basins: Danube River Basin (96 % of the Slovak territory) and Vistula River Basin (4 % of the Slovak territory). Two river basin districts are designated within these international river basins:

- in the Danube International River Basin (Black Sea drainage area) it is the Danube River Basin District comprising the sub-basins of Danube, Morava, Váh, Hron, Ipeľ, Slaná, Bodrog, Hornád and Bodva,
- in the Vistula International River Basin (Baltic Sea drainage area) it is the of Dunajec and Poprad River Basin District defined according to the sub-basin of Dunajec and Poprad.

Relevant hydrogeological zones are assigned to each river basin district. The list of hydrogeological zones (141) will be included in the amendment to the Regulation of the

Ministry of Environment SR 224/2005 specifying the details on identification of river basin districts, environmental objectives and water planning. The Regulation will be issued following the amendments to the Water Act which are currently in the process of approval.

Management of River Basin Districts

River basin district is a basic unit for management of river basins. River basins are managed by the Slovak Water Management Enterprise, Žilina as an authority responsible for management of important rivers. The Ministry of Environment SR is a competent authority for management of each river basin.

Water Bodies

There are 1 737 bodies of flowing surface water and 23 bodies of standing surface water identified within river basin districts in 2008. Concerning the fact that the identification of flowing surface water bodies has not been finished yet (e.g. HMWB testing) the number of water bodies could be changed. This data will be included in final version of the proposal of river basin management plans.

Considering groundwater resources, there are 101 groundwater bodies identified in Slovakia including 16 bodies in Quaternary sediments, 59 bodies in pre-Quaternary sediments and 26 geothermal water bodies – structures. The list of water bodies including maps is available on <http://www.vuvh.sk/rsv>.

When the river basin management plan is in force no modifications can be done to identified water bodies. Further specifications of water bodies can be done only within the preparation of updated version of the following river basin management plan.

6.3 Protected Areas

In 2008, several modifications were made within the regular updating of the Register of Protected Areas in accordance with Article 6, WFD. The modifications were associated mainly with establishment of new protected areas and changes in their size. Updating was related to the following protected areas:

- Protected areas intended for drinking water abstraction

Protection zones of water supply resources

At present, there are 1269 protection zones of groundwater resources and 81 protection zones of surface water resources established in the territory of Slovakia.

Overview of protection zones of water supply reservoirs according to sub-basins is shown in Table 6.3.1.

Table no. 6.3.1

Sub-basin	Protection zones of water supply resources		Area (ha)	
	groundwater	surface water	groundwater	surface water
Morava	31	0	13,865	0
Danube	29	0	6,030	0

Sub-basin	Protection zones of water supply resources		Area (ha)	
	groundwater	surface water	groundwater	surface water
Váh	447	14	211,671	19,436
Hron	173	7	56,917	9,542
Ipeľ	70	1	15,648	8,400
Slaná	76	6	13,789	13,762
Bodva	30	7	12,146	10,416
Hornád	124	18	19,324	72,693
Bodrog	230	17	7,082	339,459
Dunajec a Poprad	59	11	15,580	15,925
Total (Slovakia)	1,269	81	372,052	489,634

- Protected areas sensitive to nutrients

Vulnerable areas

In 2008, only boundaries of vulnerable areas were modified while their number remained unchanged. The list of vulnerable areas is included in Annex 1 of the Government Regulation 617/2004 establishing sensitive and vulnerable areas.

- Protected areas for conservation of animal and plant species and their habitats

NATURA 2000 Europe-wide network of protected areas

Protected Bird Areas

In 2008, the Ministry of Environment established 16 protected bird areas in the territory of Slovakia. The total number of protected bird areas is 21.

The list of Protected Areas included in the Register is shown in Table 6.3.2.

Table no. 6.3.2

Protected Area Category	Number of PA	Area (km ²)
International importance		
Protected areas intended for drinking water abstraction		
- Protection zones of water supply resources	1,350	8,617
- Protected water management areas	10	6,942
Areas with bathing waters	38	-
Protected areas sensitive to nutrients		
- Sensitive areas	1 (whole territory of Slovakia)	49,041
- Vulnerable areas	1,520	13,685
Protected areas for conservation of animal and plant species and their habitats		
- Wetlands of international importance - type „RAMSAR“	14	408
- Protected bird areas	38	11,719
- Areas of European importance	381	5,737
- Large protected areas, thereof:	23	10,727
- National parks	9	2,936

Protected Area Category	Number of PA	Area (km ²)
- Protection zones of national parks	9	2,323
- Protected landscape areas	14	5,468
National importance		
Protected areas intended for drinking water abstraction		
- Water supply streams (catchments)	102	5,423
Protected areas for conservation of animal and plant species and their habitats		
- Wetlands of national importance	72	74.3
- Small protected areas, thereof:	1,070	1,041
- directly dependent on water	312	-
- Protected fishing areas	29	-

7 WATER USE

7.1 Water Use in Water Bodies

7.1.1 Surface Water

Service Water Supply

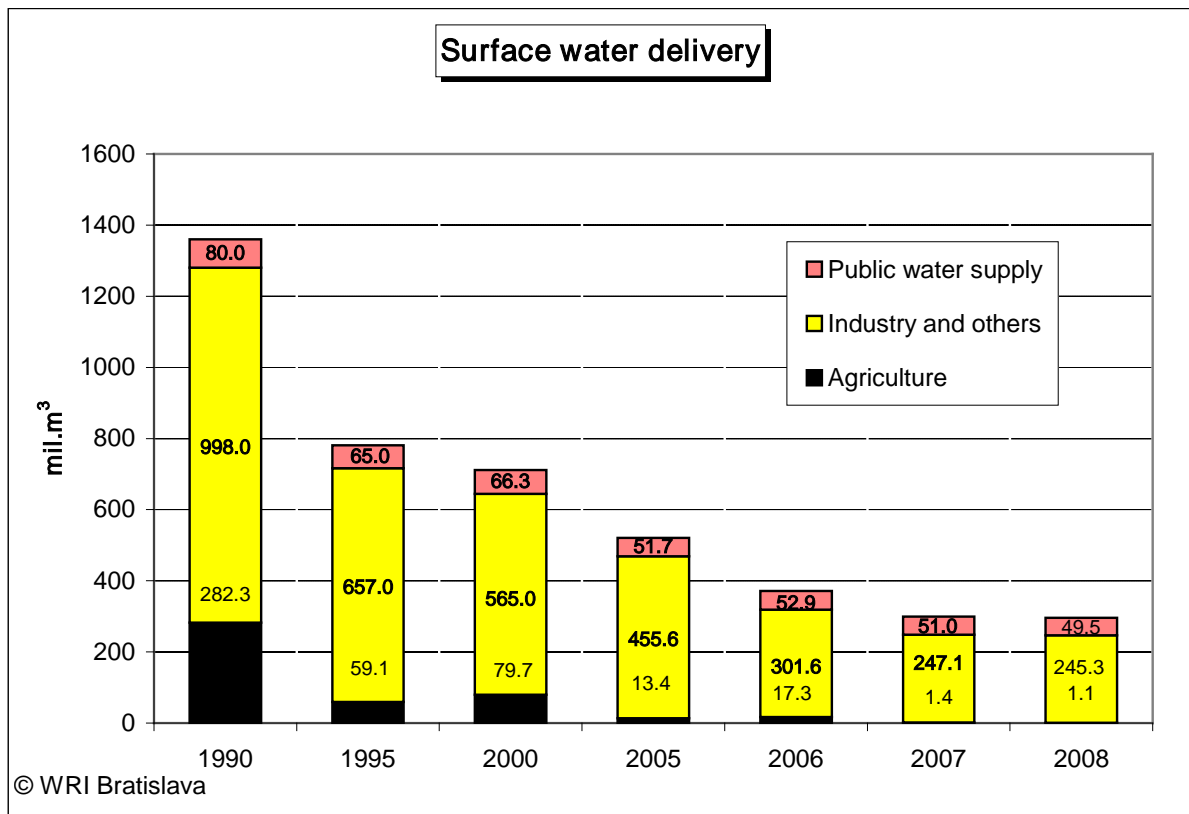
Charged surface water supply from surface resources in Slovakia has been experiencing downward trend since 1990. In 2008 decrease in water supply by 3,555 thousand m³ to volume of 295,920 thousand m³ was recorded, i.e. by 1,2 % compared to 2007. It was 5,495 thousand m³ more than stated in the approved change of water abstraction plan. Drop in water supply was only in SWME - Branch Enterprise Košice where supplies have decreased by 9,937 thousand m³. Other branches recorded slight increase. Water supply for public water supply systems decreased by 1,507 thousand m³ compared to 2007. Slight decrease by 1,744 thousand m³ was recorded in surface water supply for industry and other consumers. Decrease by 304 thousand m³ was recorded in agriculture supplies. The biggest consumer of surface water for industry is Slovenské elektrárne which used 63,738 thousand m³ in 2008. The second biggest consumer is Slovnaft which used 54,453 thousand m³ of surface water.

Surface Water Supply (charged) [thousand m³]

Table no. 7.1.1.1

	Branch Bratislava	Branch Piešťany	Branch Banská Bystrica	Branch Košice	SWE Total
Surface water supply (total):	66,612	97,640	53,890	77,778	295,920
thereof: public water supply	0	11,031	12,682	25,788	49,501
industry and others	66,612	85,553	41,200	51,990	245,355
agriculture	0	1,056	8	0	1,064

Figure no. 7.1.1.1

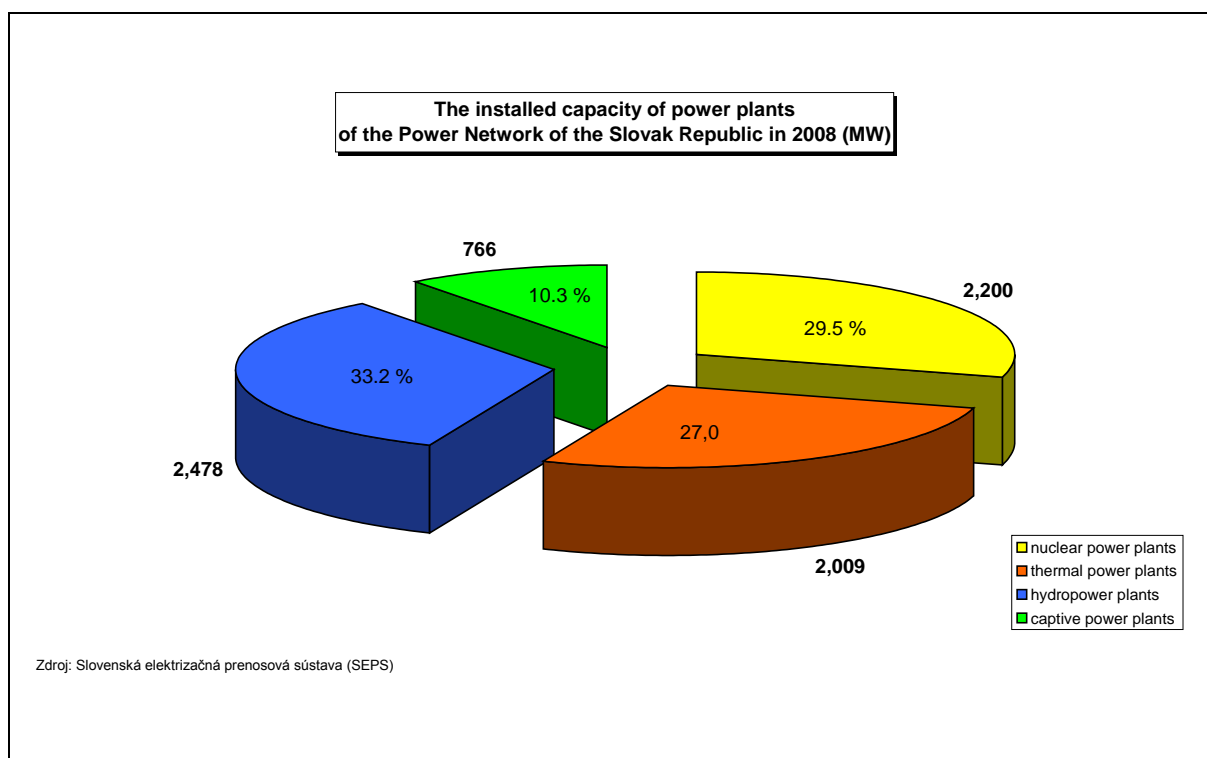


Hydropower Potential

In 2008 the Power Grid of the Slovak Republic (PG SR) continued working within European system UCTE. According to the data of the Slovak Electricity Supply System (SESS) for the year 2008 the Slovak Republic did not cover the consumption of electric energy from domestic sources. The country consumed totally 29 830 GWh, domestic production was 29 309 GWh.

The installed capacity of power plants of the Power Grid of the Slovak Republic in 2008 was 7,453 MW (figure no. 7.1.1.2.). Maximum load was recorded on January 1, 2008 at the amount of 4,342 MW at the frequency 50.012 Hz. Proportion of production in nuclear power plants represented 56.0%, in thermal power stations 18.9 %, in hydropower plants 14.3 % and in captive power stations 9.0 %. Production in hydropower plants was influenced by hydrological conditions and reached the value 4,284 GWh which is approximately the same number as in the year 2007 (4,485 GW). Gabčíkovo Waterworks produced 2,154.877 GWh.

Figure no. 7.1.1.2



Today, there is 196 small-scale hydropower plants (SHPs) connected to the electricity supply system with the total installed capacity of 70,109.58 kW, out of which 31 small-scale plants with installed capacity of 8,550 kW are managed by SWME, Žilina.

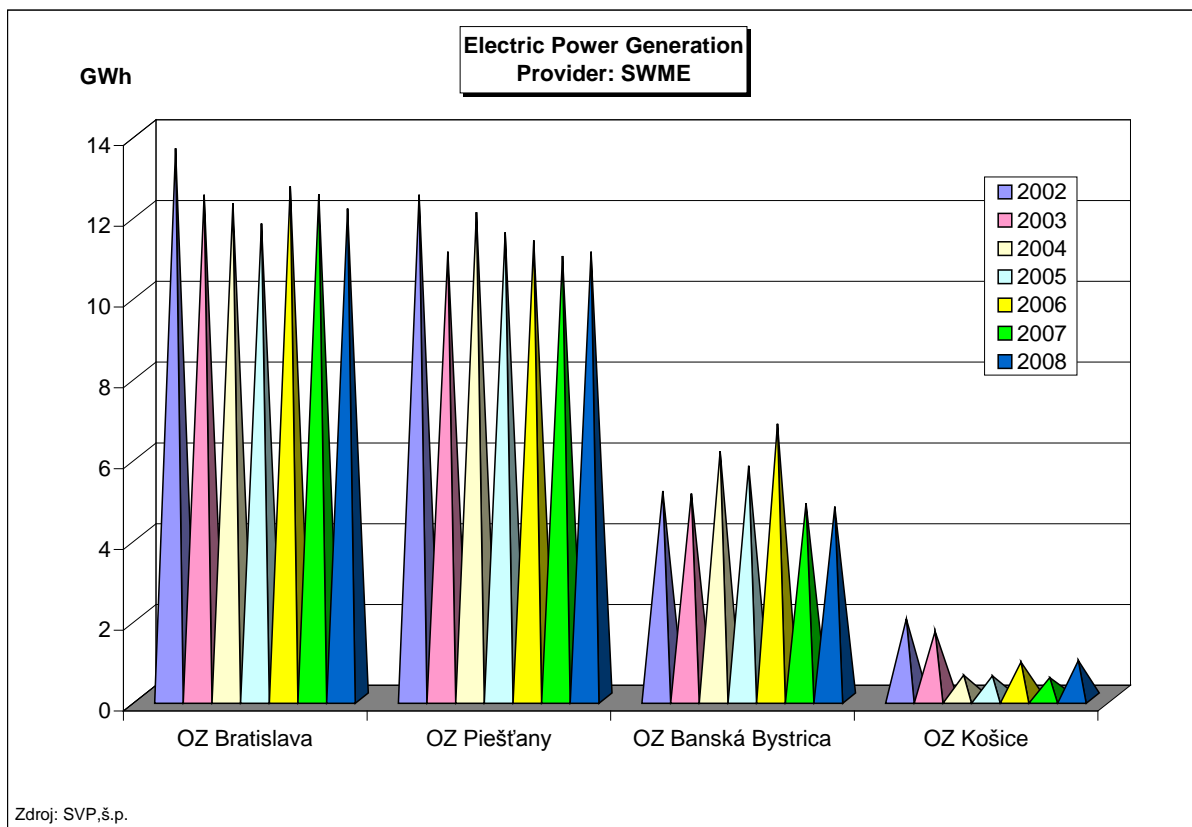
In 2008, individual organizational units of the Slovak Water Management Enterprise directly managing small-scale hydropower plants generated 28.843 GWh. This is increase of production by 0.088 GWh compared to 2007.

Part of produced electric energy was used in production and operational premises and facilities of the company. The rest was transferred into public power grid. Detailed overview of produced electric energy in the years 2002 – 2008, installed capacity and the number of small-scale hydropower plants in 2008 in the operation of the Slovak Water Management Enterprise is shown in the Table no. 7.1.1.2 and the Figure no. 7.1.1.3.

Table no. 7.1.1.2

Organizational unit of the SWME	Number of constructed SHPs	Installed capacity (MW)	Production of electric energy [GWh]						
			2002	2003	2004	2005	2006	2007	2008
Bratislava Branch	5	3.018	13.61	12.46	12.26	11.75	12.669	12.477	12.123
Piešťany Branch	12	3.095	12.46	11.05	12.03	11.53	11.332	10.947	11.047
Banská Bystrica Branch	12	2.215	5.13	5.06	6.11	5.75	6.793	4.824	4.740
Košice Branch	2	0.222	1.96	1.65	0.57	0.55	0.891	0.507	0.933
SWME Total	31	8.550	33.16	30.22	30.98	29.58	31.685	28.755	28.843

Figure no. 7.1.1.3



From the viewpoint of operation of water management and power structures the most significant investments were the works related to repairs of the left navigation lock of Gabčíkovo Waterworks in 2008. Due to the malfunction being an obstacle for smooth operation it was necessary to replace the hydro-cylinders of right navigation lock. In connection with the change to Euro currency the modification of existing informational systems was made as well as the implementation of new hardware and software equipment.

Considering legislation process, the Act no. 283/2008 Coll. of July 2, 2008 amending the Act no. 656/2004 Coll. on energy sector and amendment of some acts in wording of later provisions was issued.

Irrigation Systems

Irrigation systems are constructed on an agricultural land covering 321 thousand ha. They include 441 irrigation networks and 487 pumping stations.

Within the system of adjustments of water regime on agricultural soil there are built also drainage systems of 450 thousand ha as a part of hydromelioration facilities.

Hydromelioration Bratislava, state enterprise has been the operator of main melioration machinery of irrigation and drainage since July 7, 2003.

The Ministry of Agriculture decided about the change of present mode of operation and use of irrigation systems in a way that since 2007 the irrigation systems have been rented out to agro-entrepreneurs, associations of agro-entrepreneurs or in case of no interest of before mentioned subjects they can be offered to present operators as well.

In 2008 the total amount of rented irrigation areas was 225,071 ha in the following way:

Region	Area (ha)	Number of units
Záhorie	12,534	15
Podunajsko	62,304	72
Dolné Považie	63,347	57
Horné Považie	35,899	34
Ponitrie	10,030	24
Pohronie a Poiplie	23,491	27
Bodrog a Hornád	17,466	14
Total	225,071	243

The extent of real water abstraction designed for irrigation in 2008 irrigation season was mostly affected by numerous rains in vegetation period which created some space for an option of not such a strong need of irrigation systems use for agro-entrepreneurs in some regions. At the end of July the registered abstracted irrigation water was only in the amount approximately 6.6 million m³ and in August the increase to 8.5 million m³ was recorded.

Irrigation water abstraction in individual regions is the following:

Region	Abstraction (thousand m ³)
Záhorie	1,612
Podunajsko	1,560
Dolné Považie	3,462
Horné Považie	681
Ponitrie	144
Pohronie a Poiplie	1,034
Bodrog a Hornád	11
Total	8,504

Allocated financial means for preservation of operation capability of hydro-melioration facilities were assured by the contract in the amount of 18.0 million SKK (0.597 mill. €). In 2008 these were fully given and spent by the Hydromelioration state enterprise.

These financial means were used for the purpose of maintenance and repair of hydro-melioration property of the state. Financial means for investment purposes were not granted.

Waterways

Slovak Water Management Enterprise Žilina is the river authority and operator of waterways. Concerning international-legal regime on the waterways monitored and

administrated by the enterprise – the Danube, Morava and Váh as well as not monitored waterways - Small Danube, Danube branch system and the old Danube riverbed which are used for the purpose of sports and recreation, the scope of activities of the SWME is divided into more areas:

- *The Danube* as the monitored international waterway being subject to the regime AGN and observing the recommendations of the Danube Committee for necessary parameters of waterway.
 - Within water management activity in the process of regulation of water course and waterway (in line with the cooperation, regulations and requirements of water management authorities and organizations of Austria and Hungary through the Transboundary Waters Committee) there was implementation of the following activities: adjustment and regulation works, dredging operations, regulation of bank reinforcement, construction of spurs, distribution on water by ships, port maintenance, ice breaking, flood protection activities, structures on waterways, dams, dispatching operation, daily reports within international conventions, etc.
 - Within navigation which must be performed by the Slovak Republic pursuant to international conventions and current legislation in close cooperation with State Navigation Authority Bratislava and navigation authorities of Austria and Hungary, there was demarcation of the Danube, Morava and Váh shipways and all structures administrated by Bratislava Branch where any navigation or projects are possible. Permanent operation of supervisory boat at Gabčíkovo Waterworks and operation of the ferry in the headrace canal of Gabčíkovo Waterworks are difficult and very rare activities in the Slovak Republic.
- *The Morava* - as far as 6.00 river kilometre monitored international waterway belonging to the category with necessary parameters of the Danube River. Then up to the border with the Czech Republic it is a perspective monitored waterway currently intended for sport and recreation purposes. Navigation marks are kept pursuant to the “Regulations of Navigation Safety” valid on the international waterways.
- *The Váh* - national monitored waterway of the international importance operated by the Slovak Water Management Enterprise – Branch Enterprise Bratislava from the Danube mouth to the Small Danube mouth into the Váh River in Kolárovo. The section was demarcated pursuant to the valid Navigation Regulation issued by the State Navigation Authority Bratislava. In 2008 river training works were performed.
- *Other - not monitored waterways* serving mainly the purpose of sport and recreation:
 - Small Danube – maintenance of flood and navigation passability as well as marking navigation barriers such as small-scale hydropower plants, bridges, footbridges, etc.
 - the old Danube riverbed and Danube branch system – following the order of the Water Management Construction, state enterprise; these activities were done: operation works, maintenance and demarcation of navigation structures and operation of navigation locks in Čunovo and Gabčíkovo.

- In 2008 in the section of Komárno – Šaľa waterway no commercial use of cargo vessel was recorded.
- Section of the Hron River from Polonka to Kamenný Most (from 243,000 river km to 6,990 river km) is used for sport purposes (water tourism). To increase the safety of water tourists it is necessary to check the marking of all dangerous spots on water course as well as forbidden sections (cascades, weirs, etc.) before the beginning of water season.

Slovak Water Management Enterprise, Košice Branch operates waterways on water reservoirs Veľká Domaša, Zemplínska Šírava a Ružín I. where annual demarcation of navigation channels is made on before mentioned water bodies as well as their regular monitoring and maintenance during navigation season.

Pursuant to valid generally binding Regulation of the Regional Office in Košice no. 1/2003 on modification of water use for vessels with internal combustion engines, the Bodrog water course is ranked among waterways in the section from state border with Hungary – 0.00 river km to the confluence of the Latorica River and Ondava River in 15,00 river km. Demarcation of the navigation channel in this section is not currently provided by the administrator. In 2008 the Slovak Water Management Enterprise provided the elaboration of navigation schedule with demarcation of navigation channel in related section of the Bodrog River. Currently we are expecting the approval of navigation schedule by the State Navigation Authority after preceding commentary procedure.

Special-Purpose Fish Management

Special-Purpose Fish Management within the Slovak Water Management Enterprise Banská Štiavnica was provided in the following 8 water reservoirs: Turček Reservoir, Nová Bystrica Reservoir (SWME, Piešťany Branch), Hriňová Reservoir, Klenovec Reservoir, Málinec Reservoir, Rozgrund Reservoir (SWME, Banská Bystrica Branch), Bukovec Reservoir, Starina Reservoir (SWME, Košice Branch).

Also in 2008 there were fish management measures taken in above-mentioned water supply reservoirs necessary for proper fulfilment of the tasks related to the special-purpose fish management.

Total costs for fish planting in water reservoirs reached the financial amount 1,503,061 SKK in 2008.

Within the bio-melioration procedures the activities were implemented in the territory administrated by the Slovak Water Management Enterprise, Košice Branch, Bodrog River Basin Authority Trebišov in the following localities – compensating reservoir Malá Domaša in Slovenská Kajňa, Filling Station Kamenná Moľva and Filling Station Streda nad Bodrogom. At the same the research was done on the Udoč Canal.

7.1.2 Groundwater

Groundwater, as one of important natural resources, represents invaluable, easily available and the most appropriate drinking water resource from quantitative, qualitative and

economic viewpoints. Sufficient amount, better quality, low treatment costs and potentially low risk of contamination make groundwater a dominant resource of drinking water.

Assessment of relations between potential available groundwater quantity and used groundwater quantity is carried out through the annual water management balance developed by SHMI.

Basic evaluation unit of groundwater balance is a hydrogeological region with its subsequent classification into sub-regions. According to valid hydrogeological regionalization (1995) the territory of Slovakia was divided into 141 hydrogeological regions.

Groundwater Resources

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Groundwater Resources

Despite favourable hydrological and hydro-geological conditions for creation, circulation and accumulation of ground water there is one disadvantage in the Slovak Republic – unbalanced distribution. The most significant amounts of ground water are registered in Bratislava and Trnava Region. On the other hand the lowest amount of ground water is registered in the area of Prešov and Nitra Region.

Based on water management balance data, natural resources of Slovakia are amounted to $146.7 \text{ m}^3 \cdot \text{s}^{-1}$. As of December 31, 2008 groundwater resources represented the amount of $77,079 \text{ l} \cdot \text{s}^{-1}$, i.e. more than 52 % of natural resources. The Committee for Available Groundwater Quantity Classification approved $45,824.2 \text{ l} \cdot \text{s}^{-1}$, representing 59.5 % of available groundwater amount and 31.2 % of natural groundwater resources.

The total available groundwater amount represents the sum of available resources approved by the Committee for Available Groundwater Quantity Classification and supplies not approved by the Committee which are determined following the volumes documented from hydro-geological observations and surveys.

Total available groundwater resources as of December 31, 2008:

- approved by the “Committee”: $45,824.2 \text{ l} \cdot \text{s}^{-1}$
- not approved by the “Committee”: $31,255.3 \text{ l} \cdot \text{s}^{-1}$
- total: $77,079.5 \text{ l} \cdot \text{s}^{-1}$

Compared to the previous year there was recorded an increase in available groundwater resources by 248.7 l.s^{-1} (0.32 %) in 2008. The increase of approved available groundwater resources was 1.49% (difference by 674.5 l.s^{-1}). On the contrary other available groundwater resources in comparison with 2007 decreased by 1.34% (by 425.8 l.s^{-1}) which was caused by the transfer of a part of not approved resources to approved ones. Majority of available resources in 2008 – more than 59 % is comprised of available resources approved by the “Committee”.

According to documented available groundwater resources it can be stated that current and also expected water demand is well assured.

Groundwater Use

Groundwater is preferentially intended for drinking water supply under the Water Act - Section 3, Paragraph 4.

Groundwater abstraction has been following the downward trends in Slovakia since 1990. In 2008 used groundwater resources amounted to $11,122.1 \text{ l.s}^{-1}$ that represents a decrease by 243.9 l.s^{-1} (2.1 %) compared to 2007.

Data on groundwater abstraction are included in the SHMI Water Abstraction Register. The data are provided by the consumers based on responsibilities resulting from the Water Act and Decree of the Ministry of Environment No. 221/2005 Coll.

In 2008 the SHMI Water Abstraction Register listed 5460 resources of Slovakia. Review of groundwater abstraction in Slovakia in 2007 and 2008 according to their purpose of use are listed in table no. 7.1.2.2.

Table no. 7.1.2.2

Purpose of use	Water abstraction [l.s^{-1}]		Difference	
	2007	2008	[l.s^{-1}]	[%]
Public water supply	8,441.6	8,468.8	27.2	0.3
Food industry	383.9	285.0	-98.9	-25.8
Other industries	891.3	823.0	-68.3	-7.7
Agriculture – animal production	267.8	253.3	-14.5	-5.4
Agriculture – plant production	146.3	67.5	-78.8	-53.9
Social needs	333.4	271.2	-62.2	-18.7
Other	901.7	953.3	51.6	5.7
Total	11,366.0	11,122.1	-243.9	-2.1

Source: SHMI Bratislava

In the assessment of ground water use in Slovakia according to the purpose it can be stated that there was the increase of water consumption in public drinking water supply of the inhabitants and other use. On the contrary, abstractions decreased globally in other sectors.

From the viewpoint of water management use the ratio of usable amounts and abstractions varies in individual hydro-geological regions.

Groundwater Balance

Groundwater management balance deals with the relation existing between available groundwater resources and water requirements in related year and it is a parameter of use rate of water resources by expressing the balance status. Following the results of water management balance in 2008, 123 regions were in good balance condition, 17 regions were in satisfactory balance condition and 1 region was in bad balance condition out of the total number 141 hydro-geological regions in the Slovak Republic. It is necessary to say that in several hydro-geological regions in good or satisfactory balance condition - mainly in some water supply localities of great importance – bad, critical or emergency balance condition was recorded which refers to improper and excessive use of groundwater resources. Unfavourable balance condition (critical and emergency) in evaluated territory, or exceeding determined ecological limits, indicates the need to implement new and supplementary resources (hydro-geological surveys) or necessity to reduce abstraction from available water resources. On the contrary favourable balance condition (good satisfactory) and observance of ecological limits indicates the possibility of further trouble free use of ground water resources.

Globally we can say that due to abstraction decrease and increase of available groundwater resources there is improving tendency of groundwater balance condition in the Slovak Republic.

Groundwater Quality

Ministry of Environment of the Slovak Republic provides locating and assessing the condition of ground water through the Slovak Hydro-meteorological Institute. Systematic ground water quality monitoring within the national monitoring programme has been provided by the Slovak Hydro-meteorological Institute since 1982.

In line with the strategy for the implementation of the Water Framework Directive in the Slovak Republic the Programme of Water Condition Monitoring for 2008 - 2010 was prepared. This document included the requirements to collect all the information on water condition necessary to be reported to the European Commission in required quality.

The division of the territory of Slovakia into important water management areas for the purpose of monitoring was cancelled in line with the requirements of WFD. Since 2007 the territory has been divided according to boundaries of the groundwater bodies. Monitoring of ground water chemical condition was classified into basic and operational monitoring.

Within the basic monitoring all ground water bodies were covered by at least one abstraction site. In 2008 the ground water quality was monitored in 133 objects of basic monitoring. These objects are either a part of state monitoring network of the Slovak Hydro-meteorological Institute or the springs not affected by point pollution sources. Ground water samples were taken twice a year in 40 quaternary objects, once a year in 49 pre-quaternary objects and three times a year in 44 pre-quaternary karst objects.

Operational monitoring was done in all ground water bodies assessed as risk because of reaching not good chemical condition. Monitoring network was enlarged by adding 34

piezometric wells in the territory of Žitný ostrov where the levels 1 – 3 are monitored, what is 84 levels altogether. The region of Žitný ostrov represents a separate part of the SHMI monitoring network because it plays an important role in the whole process of monitoring of water quality changes in Slovakia since this region is the most significant drinking water resource in our territory. In the region of Žitný ostrov the samples were taken 4 times a year for basic monitoring and twice a year for additional monitoring in spring and autumn periods (extreme groundwater levels). To meet the requirements of the Directive no. 91/676/EHS related to water protection against pollution caused by nitrates from agricultural sources, the pollution caused by nitrogenous substances was monitored in 116 objects in vulnerable territories in Slovakia within operational monitoring in 2008. Next in 2008 in Slovakia (Žitný ostrov excluding) within operational monitoring 212 objects were monitored because there is an assumption of potential infiltration of pollution into ground water from potential pollution source or related group. The frequency of sampling was twice a year in 156 quaternary objects, once a year in 28 pre-quaternary objects and three times a year in 28 pre-quaternary karst objects.

The results of laboratory analyses were assessed under the Regulation of the Slovak Government No.354/2006 Coll. on Drinking Water Requirements and Drinking Water Quality Control. The assessment is performed using comparison of measured and limit values of all analysed indicators. The results will be published in the annual report "Groundwater Quality in Slovakia for 2008" and biennial report "Žitný ostrov Groundwater Quality for 2007 - 2008".

Within the basic monitoring objects of ground water the recommended value of the percentage of water saturation by oxygen determined in the field was reached in 66 % of samples. Measured pH values were in the range of limit values with the exception of 9 samples, conductivity exceeded the indicating value specified by the Government Regulation 5 times of out the total number of 259 specifications.

The issues of unfavourable oxidation-reduction conditions are becoming essential which is being pointed out by the most frequently exceeded acceptable concentrations of the total Fe (53 times), Mn (57 times) and NH_4^+ (11 times). Besides these parameters there was sporadic exceeding in case of Cl^- , SO_4^{2-} and NO_3^- , CHSK_{Mn} , soluble substances at 105 °C and H_2S . Increased concentrations of the following trace elements were recorded: Al (8 times), As (8 times), Pb (3 times) a Sb (6 times) and Ni (one time). Pollution caused by specific organic substances has only local impact; majority of specific organic substances was specified under the detection limit. Limit values in this group were exceeded only in the case of naphthalene. In the group of parameters of general organic substances the determined limit was not met by total organic carbon (twice) in the object 235690 Nová Ves nad Žitavou.

In the objects of operational monitoring, including the territory of Žitný ostrov, groundwater has relatively low oxygen content which is also confirmed by the fact that recommended value of the percentage of water saturation by oxygen was reached only in 15 % of samples. The values of conductivity measured in the field exceeded the indicating value specified by the Government Regulation 61 times out of the total number of 666 specifications; pH with the exception of 9 samples was in the interval of limit values. Mn and

total Fe are the most frequently exceeded parameters which means that unfavourable situation of oxidation-reduction conditions is ongoing. Besides these parameters the exceeded limit values of Cl^- and SO_4^{2-} indicate the impact of anthropogenic pollution on ground water quality. Out of the group of basic parameters the soluble substances at 105 °C (45 times), H_2S (21 times) and Na (5 times) were not suitable. Land use pattern (agricultural areas) is reflected into increased contents of oxidized and reduced forms of nitrogen in ground water. Ammonium ions NH_4^+ (82 times) and NO_3^- (66 times) participated mostly in that exceeding. In the objects of operational monitoring the acceptable value specified by the Regulation was exceeded by 6 trace elements (Al, As, Sb, Cd, Ni and Pb) in 2008. Increased contents of Al (11 times) and As (32 times) were mostly recorded. The presence of specific organic substances in ground water is the indicator of human activity impact. Wider scale of specific organic substances was recorded in the objects of operational monitoring in 2008. Impact of anthropogenic activity on groundwater quality is also expressed by increased concentrations of CHSK_{Mn} (15 times).

The purpose of the monitoring programme indicates that monitoring objects of the basic monitoring are situated in the areas not affected by human activity, therefore ground water show better quality in comparison with the objects of operational monitoring designed to catch the impact of significant sources of ground water pollution.

Geothermal water is groundwater serving as a medium for accumulation, transport and exploitation of heat from rock environment. It is bound to the Triassic dolomites, limestones and pudding-stones or neogene andesites and their pyroplastics.

Today, there are 26 geothermal regions (structures) that at the same time represent geothermal water bodies pursuant to WFD. Thermal-power potential of geothermal water in all prospective regions is 5,538 MW. Geothermal waters were verified by using wells in 22 localities.

There are 120 geothermal wells (5 negative) in Slovakia. Their total capacity is $1,787 \text{ l.s}^{-1}$ and water temperature moves from 18 to 129 °C. Geothermal water was acquired through wells 92 – 3,616 m deep. Well capacity was moving between the tenths of a litre to 100 l.s^{-1} . Na- HCO_3 , Ca-Mg- HCO_3 and Na-Cl water type with mineralization 0,4 – 90,0 g.l^{-1} is prevailing. The heat capacity of these wells (to referential temperature limit 15 °C) is 306.8 MWt which represents 5,5 % out of the total potential of geothermal energy in the Slovak Republic.

Currently geothermal water is used totally in 36 localities in agriculture, house heating and for recreational purposes with total heat capacity 131 MWt which represents 2.3 % of the total potential of geothermal energy in the Slovak Republic and 42.7 % of total heat capacity of registered geothermal wells. Out of this we can see that this energy source is not used fully. One possible reason can be high costs for drilling the geothermal wells, providing necessary technology and equipment as well as low awareness about possibilities of supporting the projects from domestic or foreign sources. Despite before mentioned barriers there has been recorded the increase of interest in geothermal energy use in recent years.

Natural healing water resources, natural mineral water resources, mining water and geothermal water are described in detail in the Report on Water Management in the Slovak Republic in 2006.

7.2 Drinking Water Supply

The total number of inhabitants supplied with drinking water from public water supply network increased in 2008 compared to the previous year only by 16.7 thousand inhabitants to 4,670.4 thousand inhabitants that is 86.29 % out of the total number of population of the Slovak Republic. High prices of drinking water make inhabitants disconnect themselves from public water supply system and build their own drinking water sources; however, the quality of such water mostly does not meet hygienic requirements. Development of public water supply system is regionally unbalanced.

The largest proportion of supplied population is in the Bratislava Region. Higher proportion than the total average is also in Trenčín, Žilina and Trnava Region. The public water supply network development in Banská Bystrica, Košice and Prešov regions falls behind the total average. Much more differentiated condition concerning drinking water supply occurs in particular districts where the proportion of supplied inhabitants is moving up from approximately 60 % (Vranov nad Topľou, Sabinov, Bytča, Košice – environs) up to the saturation level (Bratislava, Prievidza, Martin, Banská Bystrica, Partizánske, etc.).

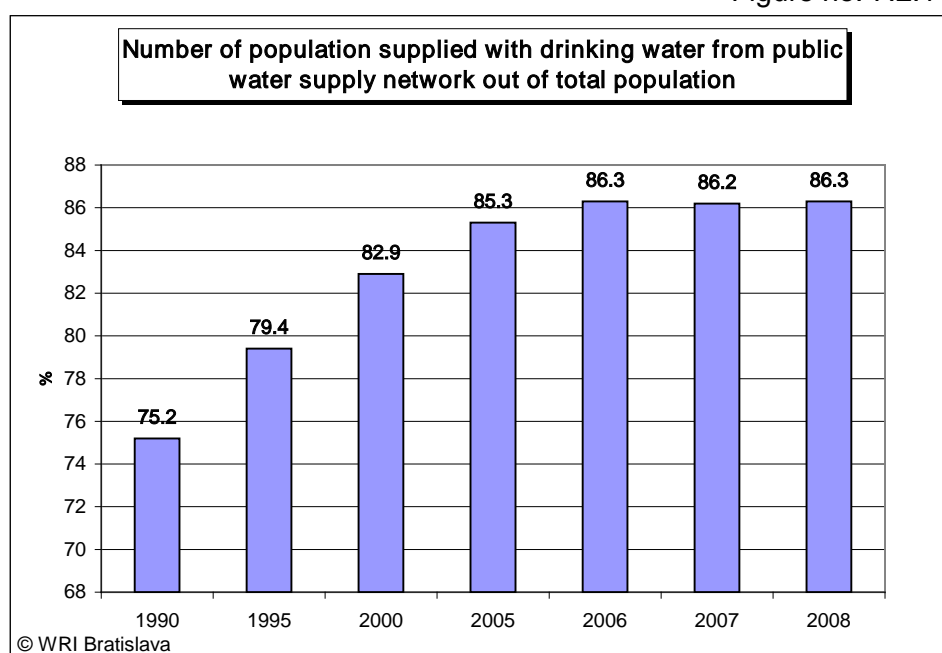
Development of the total number of inhabitants and the number of inhabitants supplied with drinking water [in thousand]

Table no. 7.2.1

	1995	2000	2005	2006	2007	2008
Total number of inhabitants	5,363.7	5,400.6	5,386.7	5,390.4	5,401.0	5,412.3
Supplied with drinking water from public water supply network	4,256.8	4,479.2	4,594.1	4,653.4	4,653.7	4,670.4
Proportion [%]	79.4	82.9	85.3	86.3	86.2	86.3

Source:WRI

Figure no. 7.2.1



Drinking water supply and development of water supply network
in administration of water companies, local authorities and other subjects Table no. 7.2.2

No	Indicator	Unit	Year				
			2006	2007	2008	Expectation	
						2009	2010
1	Number of inhabitants supplied from water supply network	thousand	4,653.4	4,653.7	4,670.4	4,696.9	4,723.2
2	Capacity of water resources	l.s ⁻¹	33,545.7	32,736.0	33,876.1	33,401.5	33,197.0
3	Length of water supply networks	km	26,356.9	26,898.7	27,377.3	27,753.8	28,161.2
4	Capacity of ground water resources	l.s ⁻¹	27,713.0	26,904.7	27,128.4	27,715.7	27,566.2
5	Water produced in water management facilities	mil. m ³	334.3	321.6	318.3	317.9	316.9
	Of which: water produced from ground water	mil. m ³	280.6	271.0	257.8	269.5	269.0
6	Water intended for use	mil. m ³	339.2	326.3	323.4	323.1	322.3
7	Water invoiced in total	mil. m ³	225.0	224.8	220.4	221.4	220.7
	Included: for households	mil. m ³	152.1	153.0	146.0	145.7	145.0
8	Water not invoiced	mil. m ³	114.2	101.5	103.0	101.7	101.6
	Of which: Water loss in pipes	mil. m ³	94.2	87.6	88.9	89.1	88.0
9	Specific water consumption (of water invoiced in the households)	l.inhab. ⁻¹ .day ⁻¹	89.5	89.9	85.6	85.0	84.1

Source: Water Research Institute

In the facilities of water companies, local authorities and other subjects there was produced 318.0 mil. m³ of drinking water in 2008 which means the decrease by 3.3 mil. m³ compared to 2007. Compared to 1990 the amount of water intended for use was almost doubled compared to 2008. The table no. 7.2.2 indicates that the decrease of invoiced water was the same as of produced water – in 2008 it decreased by 4.4 mil. m³, even the amount of water invoiced for households decreased by 7.0 mil. m³. Amount of invoiced water represented 68.2 % out of the total amount of water intended for supply.

Since water supply to households decreased again and the number of supplied inhabitants increased, the specific drinking water consumption for households decreased again to the number of 85.6 inhab.⁻¹.day⁻¹ in 2008. It is alarming situation not only because this water abstraction is close to hygienic minimum but mostly because the high costs for drinking water lead to construction of own sources of drinking water with the quality often far behind the hygienic standards.

The volume of not invoiced water increased to 103.0 mil. m³ which is 31.8 % of water intended for supply. Water loss in pipes (27.5 % of water intended for use) covers 86.3 % of this number. The measures for reduction of water loss in pipes to acceptable level corresponding with European trends should be adopted and implemented.

Construction of public water supply network led to an increase in number of technical facilities and structures. Compared to 2007 the total length of water supply systems in Slovakia (water companies, local authorities and other subjects) increased by 478.6 km up to the total length 27,377.3 km. (Data on water supply and water supply network development are listed in the table no. 7.2.2).

Figure no. 7.2.2

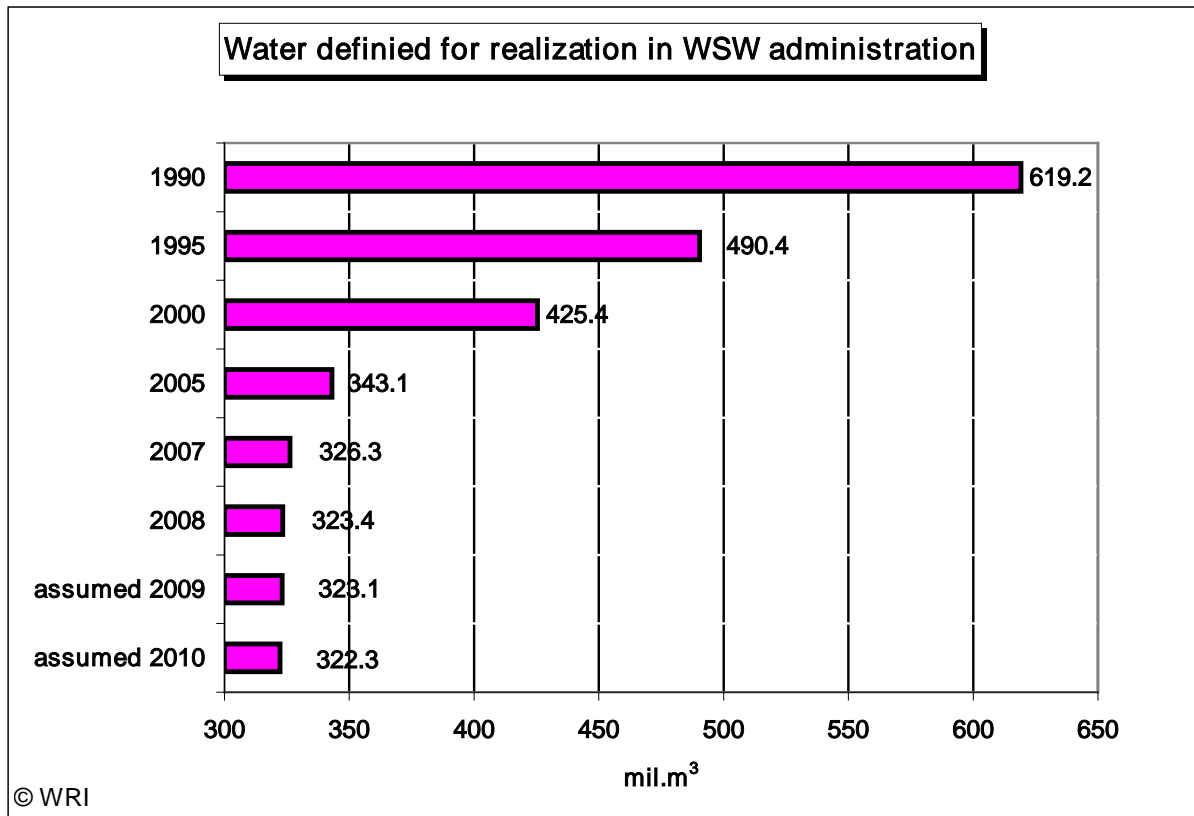
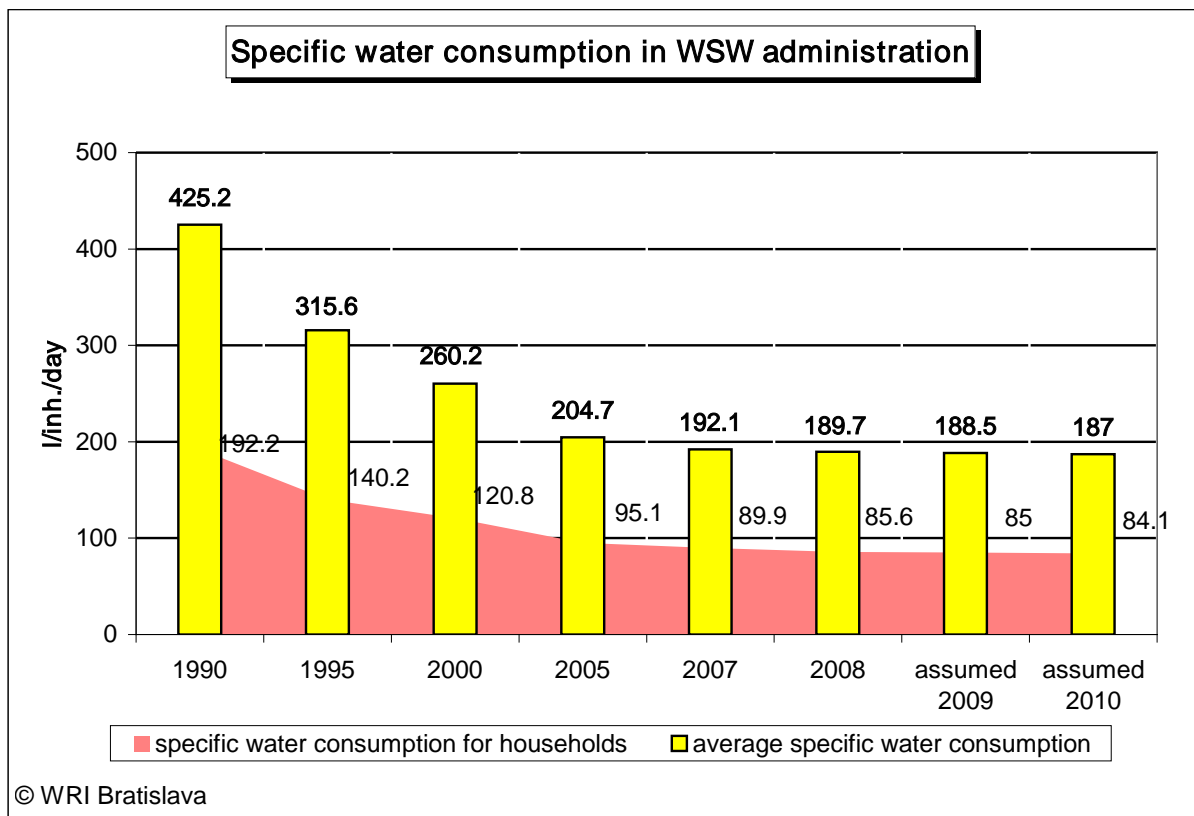


Figure no. 7.2.3



Drinking water quality

Assessment of drinking water quality in public water supply systems is based on the results of the control of public water supply system operators – water companies. Public water supply system operators control drinking water quality within operational control as well as the quality of raw and treated water during treatment technological process.

Public health authorities control ground water quality directly at consumer's place and in case of some deflection the water companies should be able to demonstrate where this deflection comes from.

Water quality is assessed on the basis of the number of determinations of individual water quality parameters exceeding related hygienic limits. Government Regulation no. 354/2006 Coll. setting requirements on water intended for human consumption came into effect on June 1, 2006.

In 2008 as many as 11,382 drinking water samples from sampling sites in water distribution network were analyzed in laboratories of water companies. In these laboratories 287,783 analyses were done concerning particular parameters of drinking water quality.

In 2008 the portion of drinking water analyses meeting hygienic limits reached the value 99.45 %.

Number of samples meeting the requirements for drinking water quality concerning all parameters reached the value 91.84 % in 2008.

Exceeding the limit values in drinking water samples in line with the Government Regulation no. 354/2006 Coll. on requirements for drinking water and drinking water quality control

Table 7.2.3

Year	2005	2006	2007	2008
Amount of drinking water samples not meeting the limits with HLV	2.10 %	1.32 %	2.03 %	2.34 %
Amount of analyses of drinking water quality parameters not meeting the limits with LV, HLV and IV.	0.55 %	0.32 %	2.46 %	1.02 %
Amount of analyses meeting hygienic limits (%)*	99.32 %	99.44 %	99.32 %	99.45 %
Amount of samples meeting the requirements for drinking water quality in all parameters (%)*	89.59 %	91.18 %	89.78 %	91.84 %

IV – indicating values, LV – limit values, HLV – highest limit values, LVRR – limit values of referential risk

* Parameter Free chlorine is not included in the amounts.

7.3 Wastewater Collection and Treatment

Development of public sewerage system falls behind the development of public water supply network in the Slovak Republic. In 2008 the number of residents connected to public sewerage system increased by 49.6 thousand to the total number of 3,196.6 thousand inhabitants representing 59.06 % out of the total number of population. Unfavourable situation is in particular regions and districts. Trnava, Žilina and Nitra regions are below the nationwide average value. At the district level the worst situation is in the districts of

Komárno, Námestovo, Čadca and Košice-environs where the proportion of inhabitants living in houses connected to public sewerage system is lower than 30 %.

Development of public sewerage system and volume of discharged wastewater through public sewerage system administrated by state companies of water and sewage works is listed in the table no. 7.3.1 and figure no. 7.3.1.

Wastewater discharge and development of sewerage system managed by water companies, local authorities and other subjects

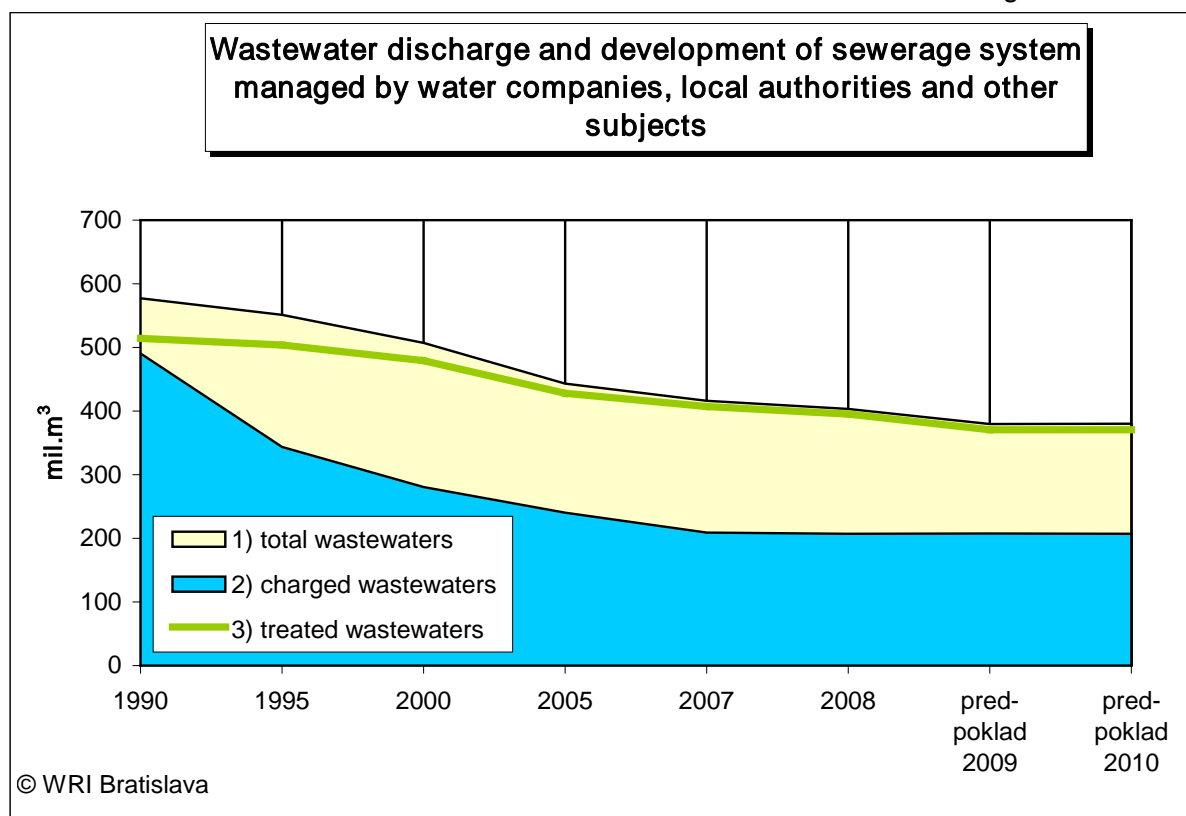
Table no. 7.3.1

No	Indicator	Measure	Year				
			2006	2007	2008	Expectation	
						2009	2010
1	Number of inhabitants connected to public sewerage system	thousand	3,100.5	3,147.0	3,196.6	3,250.8	3,290.2
	Of that: in houses connected to sewerage system with WWTP	thousand	3,031.1	3,060.8	3,106.9	3,175.8	3,214.0
2	Length of sewerage networks	km	8,016.1	8,496.5	9,266.4	9,650.0	9,900.0
3	Water discharged to watercourses altogether	mil.m ³	452.6	416.1	403.5	399.6	389.9
	Of that: treated wastewater	mil.m ³	439.4	407.8	395.3	380.4	375.7
4	Volume of discharged wastewater	mil.m ³	212.2	209.0	207.0	207.4	207.0
	Of that: sewerage water	mil.m ³	128.4	115.9	112.8	114.3	114.2
	industrial and other wastewater	mil.m ³	83.8	93.1	94.2	93.1	92.8

Amount of discharged wastewater (water collected - charged) includes only water companies and other entities: Water and Sewage Company, Ltd., Hlohovec; Mondi SCP, Ružomberok; KOMVaK, Komárno; (without data concerning local authorities)

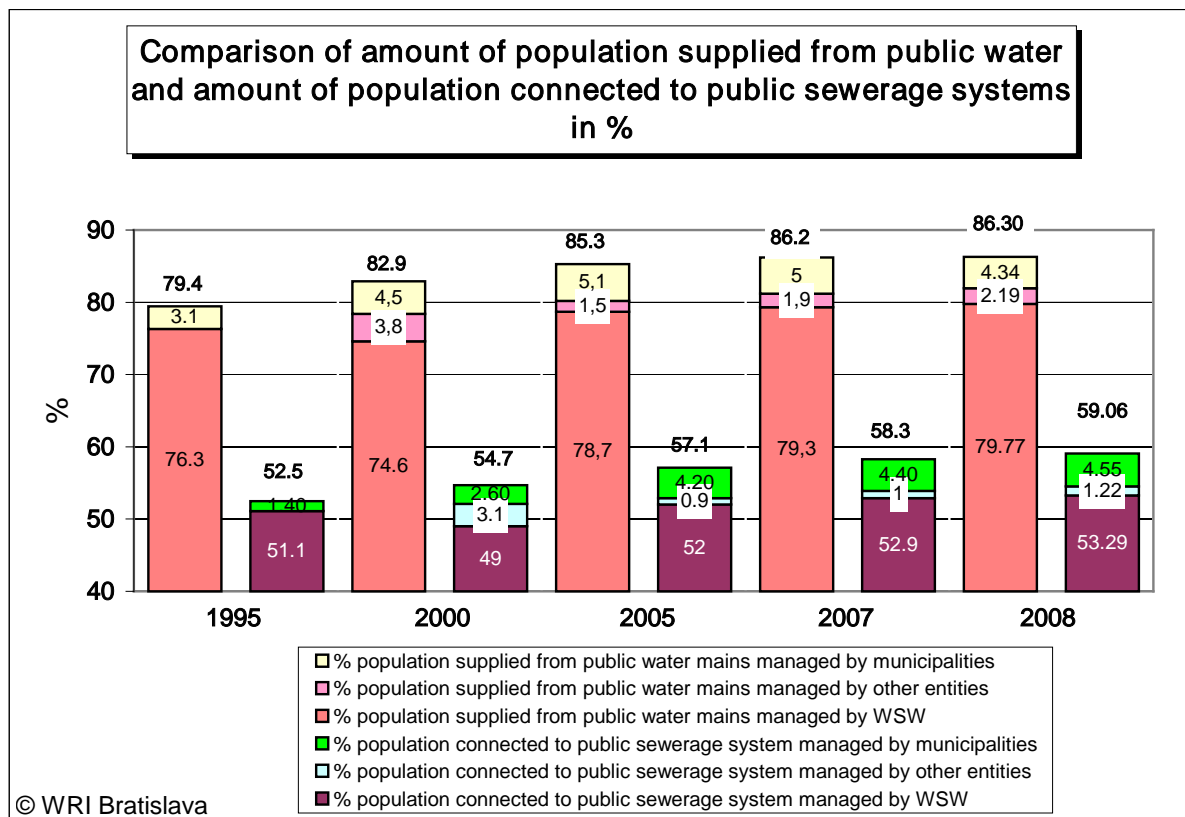
Source: Water Research Institute

Figure no. 7.3.1



Existing trend leads to significant differences in development of water supply systems and sewerage system that have an impact on environment and in connection with the requirements of the EU directives they increase investments for their implementation into practice in the Slovak Republic (figure no. 7.3.2).

Figure no. 7.3.2



7.4 Disposal and Production of Sewage Sludge

In 2008 sludge production covered 57,810 tons of dry mass. Out of this quantity 38,368 tons (66.4 %) were used in agriculture, 10,766 tons (18.6 %) were temporarily stored and 8,676 tons (15.0 %) were put at landfills. In 2008 no sewage sludge was directly applied to agricultural land. 33,455 tons of sludge dry mass were used for production of compost and 4,913 tons of sludge for soil processes.

The overview of sewage sludge generation for WWTP and sludge disposal methods in the period from 2001 to 2008 is shown in the table no. 7.4.1. Data concerning the quantity of sludge applied to soil include also the sludge added to soil in a form of compost and sludge used in soil processes.

Table no. 7.4.1

Year	Sludge production (dry mass) t/r	of which					
		application into soil		temporarily Stored		put on disposal site	
		t/r	%	t/r	%	t/r	%
2001	53,350	37,855	71.0	8,493	15.9	7,002	13.1
2002	51,270	41,960	81.8	4,870	9.5	4,440	8.7
2003	54,340	39,330	72.4	6,900	12.7	8,110	14.9

Year	Sludge production (dry mass) t/r	of which					
		application into soil		temporarily Stored		put on disposal site	
		t/r	%	t/r	%	t/r	%
2004	53,110	42,530	80.1	5,860	11.0	4,720	8.9
2005	56,360	39,120	69.4	8,710	15.5	8,530	15.1
2006	54,780	39,405	71.9	6,130	11.2	9,245	16.9
2007	55,305	42,315	76.5	9,400	17.0	3,590	6.5
2008	57,810	38,368	66.4	10,766	18.6	8,676	15.0

In the connection with the increasing requirements for waste water treatment – implementation of the Council Directive 91/271 EEC on Urban Waste Water Treatment, it is necessary to reckon with the increase of sludge production by approximately 20 – 40 %. Strategic approach of meeting the conceptual objectives based on provision of corresponding collection and treatment of waste water in the agglomerations over 10 000 p. e. and in the agglomerations from 2,000 to 10,000 p. e. is currently determined by the requirements of the Directive 91/271/EEC with the deadlines being the part of the Water Act – December 31, 2010 or 2015.

7.5 Additional Benefits of Water Management

In 2008 restoration measures were implemented in the following areas:

- Authority of Strážovské vrchy Protected Landscape Area
- Authority of Dunajské luhy Protected Landscape Area
- Authority of Záhorie Protected Landscape Area
- Authority of Vihorlat Protected Landscape Area

In 2008 there were activities in the following wetlands:

Ramsar Locality (RL) Domica, RL Demänovská dolina Caves, RL Turiec Wetlands, RL Dunajské luhy, RL Parížske močiare, RL Morava Flood Plain, Trilateral Ramsar Platform, RL Rudava Alluvial Deposit and RL Šúr.

Restoration of natural water regimes was done in RL Šúr, RL Dunajské luhy, RL Rudava Alluvial Deposit and RL Turiec Wetlands.

8 MONITORING AND INFORMATION SYSTEM

Monitoring System

Monitoring of ground and surface water is done in a complex way in the river basins and sub-basins and it is specified under the Decree No. 221/2005 of the Ministry of Environment of the Slovak Republic determining the details on detection and assessment of ground and surface water condition, its monitoring, water source inventory and water balance.

The Slovak Hydro-meteorological Institute is responsible for the framework project named Partial Monitoring System – Water and it is charged with coordination of the project via hydrological services and implementation of monitoring programmes in accordance with the above-mentioned decree.

In 2008 the Partial Monitoring System - Water consisted of the following monitoring sub-systems:

1. Quantitative indicators of surface waters
2. Quantitative indicators of groundwaters
3. Surface water quality
4. Groundwater quality
5. Thermal and mineral waters
6. Irrigation waters
7. Recreational waters

Subsystems 1 to 4 are provided by the Ministry of Environment of the Slovak Republic through the Slovak Hydro-meteorological Institute. Providing the function of the subsystems 5 Thermal and mineral waters and 7 Recreational waters are in charge of the Ministry of Health. Providing the function of the subsystem 6 Irrigation waters is within the competence of the Ministry of Agriculture.

Activities related to Partial Monitoring System – Water for 2008

Surface Water Quantity Parameters

In 2008 monitoring of surface water amount was done in 419 gauging stations of basic monitoring network. 7 gauging stations out of 419 abovementioned stations are located in the territory of neighbouring state. Besides abovementioned stations there were 2 functional stations where water levels and discharges were monitored.

Out of the total number of 421 gauging stations (including the stations established during related year) were all stations equipped with automatic measuring devices based on pressure scanning. It means that the network of stations is 100 % automated what fulfils the quality objectives of the Slovak Hydro-meteorological Institute.

In 2008 in monitoring network of surface water amount there were 2,341 direct measurements (hydrometerings) done, necessary for creation and updating the measuring curves. It was 6 hydrometerings on average on one gauging station enumerating the discharge which is a slight increase compared to preceding years.

According to bilateral agreements with the neighbouring countries 229 joint measurements with hydrological services of Austria, Hungary, Poland, Czech Republic and Ukraine were carried out in 2008. Verification of data, time orders and measuring curves was done. Representatives of the Slovak Hydro-meteorological Institute participated in the meetings of working groups of Transboundary Water Committees (TWC). International rivers are measured five to nine times a year based on bilateral agreements with neighbouring countries and approved plans.

Basic monitoring element in suspended load monitoring is water turbidity or the content of suspended load in surface flow. Monitoring of suspended load includes daily water sampling in surface flow, control water sampling, general measurement of suspended load, laboratory processing of samples (filtration and weighting), basic data processing,

assessment and consequent archiving in the SHMI archive and databank of the Hydrological Information System (HIS).

Outputs of basic processing include annual tables of water levels and discharges containing average daily, monthly and extreme values. These are stored in paper form along with monthly reports from observers in central archive of the SHMI. Data archiving related to the content of suspended load (water turbidity) are daily values of suspended load content processed in annual cycle.

Groundwater Quantity Parameters

The total number of objects within the groundwater monitoring network was 1,497 in 2008. The network is divided as follows:

- *Monitoring network of wells* (springs with and without intake structures and springs used for water supply situated in all basic hydro-geological bodies, mainly in Mesozoic). Total number of monitored wells is 358 (424 springs). Some wells have more springs which are monitored separately. Temperature and yield was measured everywhere.
- *Monitoring network of groundwater levels* (wells built mostly in quaternary – fluvial, eolian and fluvio-glacial sediments, less frequently in pre-quaternary rocks). Monitoring of groundwater levels is made on 1,139 objects.

Basic interval of monitoring is once a week in Wednesday. Measuring interval of automated devices is 1 hour. Average daily value is calculated based on measurements carried out during 1 day.

Monitoring in all objects of groundwater quantity monitoring network was provided by local observers. Systematic and conceptual development of automated monitoring process using equipment for groundwater level measurement still continues. At the end of 2008 as many as 652 automatic machines and 3 limnigraphs operated at observation structures.

After hydrological year was over the verified data were transferred to related registers of hydrological databank (4 registers for levels and temperatures of ground water and 4 registers for capacity and temperature of spring water). Monthly reports from observers or annual tables of average daily groundwater levels and well capacity were submitted to central archive of the SHMI. Moreover, data in electronic form were stored in related registers of HIS.

In 2008 development of technological line for archiving the hourly records in the central SHMI database continued. Works in 2008 were focused on finishing of archiving the hourly data of quantitative groundwater monitoring – probes and consequently on verification of level regime at individual structures during the whole monitoring period (indicating the causes of measurement failures and so on) and verification and preparation of data for central databank of the SHMI for the years 2004 – 2007. At the same time it was agreed that hourly databank of ground water quantity monitoring would be independent data register in hydrological information system of HIS SHMI.

Independent role of the SHMI databank – ground water quantity in 2008 – was providing the data and parameters from monitoring stations of groundwater quantitative monitoring till

2007 for preparing the national methodology of assessing the quantitative condition of groundwater bodies in quaternary sediments and pre-quaternary rocks. This activity was a part of WFD implementation process in the area of ground water.

In 2008 the works within the project SK05/IB/EN-01 continued. The objective of this project is to create operation and communication information system for the General Water Register. The intention of the project is gradual transformation of database system of hydrological information from Ingres to Oracle including additional extended procedures and map exports. Pilot testing of the whole system started at the end of the year.

Surface Water Quality Parameters

In 2008 surface water quality was monitored within the approved Programme of Water Condition Monitoring for 2008 taking into account 314 sampling sites. For the reason of costs minimization a part of sampling sites was monitored for several purposes.

Basic monitoring network consists of 171 sampling sites out of which 35 sampling sites will be monitored within verification of water body characterization, 68 within monitoring of referential conditions, 38 will be included in transboundary water monitoring, 75 within water course characterization and 9 sampling sites were included within the Decision No. 77/795/EHS.

Sampling of physical-chemical parameters was maximally harmonized with the time of sampling of biological quality parameters.

The results of analyses from particular laboratories were collected at the SHMI. Afterwards, the results were stored in the MAGIC information system and processed for the need of check, preparation of yearbook, preparation of water balance and other purposes.

Groundwater Quality Parameters

Groundwater quality monitoring programmes are in the process of changes that result from related EU legislation requirements, namely WFD and Directive 2006/118/ES on protection of groundwater against pollution and quality deterioration. In line with the strategy for WFD implementation in the Slovak Republic the Programme of Water Condition Monitoring for 2008 – 2010 was elaborated with included requirements for collecting all information on water condition which will have to be reported to the European Commission in required quality.

In 2008 totally 1,039 samplings and measurements in situ were made in 549 objects monitored in Slovakia with the monitoring frequency 1 – 4 times a year. Within the basic monitoring 264 analyses and measurements in situ were made in 135 objects. Within the operational monitoring 775 samplings and measurements in situ were made in 414 objects. Within the operational monitoring 248 groundwater samples were taken from 34 objects monitored in the territory of Žitný ostrov (with the frequency 2 - 4 times) and 116 samples of nitrogenous substances were taken in vulnerable areas of Slovakia. Two localities were monitored for the purpose of Czech-Slovak transboundary monitoring.

Compared to the year 2007 the frequency of ground water sampling was higher as well as the group of monitored parameters was enlarged mainly by specific organic substances –

some pesticides and relevant substances defined for Slovakia according to the Programme of Pollution Reduction.

To provide representative sampling the method airlift was used for cleaning in 100 objects of the State Groundwater Monitoring Network.

Thermal and Mineral Water

Monitoring in Slovakia includes 39 localities out of which 36 localities provide data transfer to a central database of the Ministry of Health of the Slovak Republic through the local information system (Baldovce, Bardejov, Bojnice, Brusno, Budiš, Cígelfka, Čerín, Čilistov, Číž, Dudince, Korytnica I, Korytnica II, Kováčová, Kláštor pod Znievom, Lipovce, Lúčky, Lúka, Martin, Maštinec, Mníchova Lehota, Nimnica, Nová Ľubovňa, Piešťany I, Piešťany II, Rajecké Teplice, Santovka, Sklené Teplice, Slatina, Sliach, Smrdáky, Sulín, Tornaľa, Trenčianske Mitice, Trenčianske Teplice, Turčianske Teplice, Vyšné Ružbachy). In total, there are 156 objects included in monitoring system - 101 recognised natural and healing mineral resources and 55 other observation resources.

In 2008, monitoring of selected parameters using automatic measuring equipment was provided in 30 localities on 63 resources: Baldovce, Bardejov, Bojnice, Budiš, Čerín, Čačín, Čilistov, Číž, Dudince, Kláštor pod Znievom, Korytnica I, Lipovce, Lúčky, Lúka, Martin, Mníchova Lehota, Nimnica, Nová Ľubovňa, Piešťany I, Piešťany II, Rajecké Teplice, Sielnica, Sklené Teplice, Slatina, Sliach, Sulín, Tornaľa, Trenčianske Mitice, Trenčianske Teplice, Turčianske Teplice a Vyšné Ružbachy.

In remaining 9 localities selected parameters are measured manually or partially manually in intervals according to a valid decision for utilization of resource. Thus, the values are manually inserted into the database LIS (local information system). The data files are stored manually and data analysis protocols and trials of natural healing and natural mineral waters conducted by accredited laboratories, which are listed by the State Commission for spa. The collected data from LIS IKZ are sent at regular intervals (at least once per month) in synchronised files to the CIS of the Ministry of Health SR.

Monitoring, evaluation and archiving of regime parameters of natural healing and natural mineral resources under the authorization to use the source control and qualitative indicators of natural healing and natural mineral water is carried out by the Ministry of Health SR – Spa and Spring Inspection Office continuously, according to the message transmission system of synchronised files. Processed documents are used as a basis for designing and implementing the measures to protect natural resources and natural healing mineral resources.

Irrigation water

In 2008, irrigation water quality was monitored in the whole territory of Slovakia in 80 sampling sites. In total, 497 samples were registered. Laboratories of the Soil Science and Conservation Research Institute in Bratislava performed sampling and chemical analyses.

The quality of irrigation water in individual sampling sites was monitored once a month from April to October.

The measured results show that irrigation water meets the quality categories under the requirements of the standard STN 75 7143 as follows:

Category 1	235 sampling sites (28.7 %)
Category 2	47 sampling sites (58.8 %)
Category 3	10 sampling sites (12.5 %)

The irrigation water quality decrease was caused by increased pH values, higher content of dissolved substances, calcium and microbiological pollution. The most frequent cause of irrigation water quality decrease was still microbiological contamination, caused mainly by coliform bacteria, faecal coliform bacteria, enterococcus and chemical contamination, mainly caused by higher content of calcium and high pH values.

The users of the irrigation source were informed on the quality, which did not correspond to the first grade of water quality in accordance with STN 75 7143. Each operator, lessee of the respective pumping station received a report on the quality of irrigation water.

In 2008, there was no pollution of irrigation water caused by heavy metals, NEL and PCB. Similarly the limit concentration of atrazine, simazine, cadmium, lead, mercury and nickel, which are included in the list of priority substances pursuant to the Water Act, was not exceeded in irrigation water in monitored localities.

Recreational waters

We distinguish two main types of recreational water in our conditions – natural recreational localities, mainly sand pits, gravel pits, lakes, delimited parts of water courses and dammed water reservoirs having besides other purpose also recreational utilization. The second type is represented by artificial swimming pools filled with thermal and non-thermal water (usually water from public water supply system).

The requirements on water quality and responsibilities of swimming pools providers were defined under the Act No. 355/2007 Coll. on support, development and protection of public health and amendment of some acts, in the governmental Regulation No. 87/2008 Coll. on Requirements on Natural Bathing Facilities and in the Decree of the Ministry of Health SR 72/2008 in the specifications concerning the Requirements on Quality of Bathing Water and its monitoring.

The bathing season is considered the period from 15 June to 15 September. The actual start and completion of operation of each bathing facility are determined by the operator depending on weather and readiness to operate the swimming pool. In 2008, for bathing facilities with organised recreation (pool has an provider who is responsible for quality of service) the operation of swimming pools was permitted by regional authorities of public health on a basis of proving the bathing water quality and state of readiness to start the season. During the next period swimming pools and their hygienic mode of operation were monitored at defined intervals according to current needs.

The maximum use of capacity was in July and August. In the second half of the season the weather was changeable, unsuitable for swimming and therefore in August the operation of swimming pools, particularly natural and non-thermal, was limited.

Natural bathing waters

In total 70 natural sites were monitored in 2008, namely gravel pits, sand pits and dammed water reservoirs having also recreational utilization besides other purpose. Only 18 localities were available for organized recreation, on 10 it was partial organised recreation, which means that only nearby beaches were available without water or possibly care of water reservoir was divided between a municipality and operator of facilities in nearby beaches. Remaining localities hosted the so-called unorganized recreation and monitoring was carried out by regional authorities of public health, depending on the traffic and the current situation. For those sites of European importance which experienced more visitors, regular monitoring of the bathing water quality was carried out at the beginning and during the season. Approximate quality control of bathing water is carried out on water resources which are used for bathing by a small number of visitors.

Localities with water not suitable for swimming, which were monitored in the past for a longer time but currently are used only for fishing purposes (Health Campus Šahy) or localities with small visit rate (e. g. Ontáριο Biele brehy Sučany, Lipovec lakes – gravel in the district of Martin) have not been monitored this year.

35 natural sites, proclaimed to be suitable for bathing during the season were also monitored pursuant to the EC requirements by generally binding provisions of the Regional Environmental Office.

During the summer season 453 water samples were collected, on which 6,883 examinations of physical-chemical, microbiological and biological water quality indicators were carried out. A threshold or limit value of the set of indicators has been exceeded in 218 samples in 410 indicators.

Artificial bathing waters (swimming pools)

There are 181 bathing facilities with 503 swimming pools in Slovakia (185 thermal and 318 regular swimming pools). In 2008, 157 bathing facilities with 485 (of which 167 thermal and 318 regular) swimming pools were in operation. Out of 2,343 samples in total 36,913 physical-chemical, microbiological and biological parameters were analysed. Threshold values were exceeded in 1,134 cases in 2,264 parameters.

The detected deficiency was mainly related to meeting the water quality parameters suitable for bathing (microbiological parameters and free chlorine). Insufficient quality was mainly caused by inadequate technological processes used in treatment of pool water, insufficient pool refilling, low efficiency of recirculation and insufficient or excessive pool water disinfection.

Information system

In line with the Directive INSPIRE 2007/2/EC <http://inspire.jrc.ec.europa.eu/> and <http://www.sazp.sk/inspire/>) and related implementing rules on Metadata adopted by the European Commission on 14 May 2008, a requirement for creation of metarecords for services was incorporated. At the same time a catalogue service according to the standard OpenGIS® Catalogue Services Specification was created.

EnviroInfo is an Internet database application, available for wide public on website: <http://enviroinfo.enviroportal.sk>. It provides possibility of standardised creation, collection and availability of described information (metainformation - metadata) on documents, databases, maps, raster, vector and other data, which are important for environment, in terms of definition of information on environment according to the Act 205/2004 Coll. on collection and Dissemination of Environmental Information. At the same time it provides for fulfilment of Act 211/2000 Coll. on Free Access to Information as amended as well as the Directive 2007/2/EC INSPIRE.

According to a plan of unification of information systems (IS) operated by the Ministry of Environment of the Slovak Republic an analysis of IS was done as far as the computerised creation of meta-reports is concerned and IS EIA/SEA was selected - Assessment of environmental impact. A link between IS EIA / SEA and *EnviroInfo* provides a computerised collection of metadata and facilitates searching the data from a unified environment.

Information System of Environmental Authorities - ISÚŽP (www.sazp.sk/isuzp) - specialised subsystems of air, water, waste, nature, effects, accidents and IPPC (Integrated Information System of Pollution Prevention and Control). Currently, for each subsystem an application has been created, whether as separate or as a part of the information system, which also covers other activities related to the issue.

Access to information on environment is provided through *Enviroportal* (www.enviroportal.sk). It is a "place" where the outputs of different information systems are gathered. *Enviroportal* has two target groups. The first group of users is a professional, but also general public with an interest in environmental issues. Access to information for this group is provided via online services. The second group consists of staff from regional offices and district offices, the Ministry of Environment, as well as departmental staff organisations responsible for operating and updating data in multiple information systems. These users have access and rights to work with the data through authorised clients.

The Catalogue of Environmental Objects offers the basic foundation for the systematic development of governmental infrastructure, as well as non-governmental data.

The WRI in 2008 contributed to the work by developing the geographic information system of the Ministry of Environment, information system on the territory and tasks related to integrated management of the country. In development of the Central Repository of Geographic Information on Environmental and Water Protection some spatial data and database information was used. Within the work carried out on spatial data, strategy implementation of European Water directives a review of basic topological rules was done on a layer of water bodies. A layer of water bodies in the form of network was derived. This product allows fast cartography of geo-spatial data which were identified by the river kilometres. The applicability of this method was verified in processing the database of hydro-morphological changes. An update of digital layer of vulnerable areas has been also done. The results of this work were used in the reporting of the Nitrate Directive to the European Commission.

In 2008, an implementation of corporate technical information system within the Slovak Water Management Enterprise continued with the following activities:

- Linking the Dispatching Information System (DIS) with the Technical Information System (TIS);
- Creating the mobile TIS able to display water levels at gauging stations.

9 RISK FACTORS OF WATER MANAGEMENT, CAUSES AND CONSEQUENCES

9.1 Floods

Report on progress and consequences of floods in the Slovak Republic, which occurred in 2008 was prepared and submitted to the SR Governmental deliberation. River basins of Topla, Ondava, Torysa, Hnilec and Poprad in districts of Bardejov, Svidník, Stropkov, Prešov, Sabinov, Kežmarok and Stará Ľubovňa were the most affected localities. The most critical situation arose in the Topla river basin in Bardejov district. The most serious situation was in the Torysa and Hornád river basins. The flood situation required an emergency operation on water reservoir Ružín.

The consequences caused by floods in 2008

The total costs and damages caused by floods in 2008 (Table No. 9.1.1 and Figure. 9.1.1) were quantified at 1,377.381 million SKK (45.720 mil. €), of which the cost of flood safety works were estimated at 75.764 million SKK (2.514 million. €) and the cost of flood rescue operations were amounted at 108.055 million SKK (3.586 million €).

Property damage incurred at 1,193.491 million SKK (39.616 mil. €), including property damage 57.134 million SKK (1.896 million €), to 270.460 million SKK of municipal property (8.977 million €) and regions 271.866 million SKK (9.024 million €).

There was flood damage and distortion measures for watercourses, which incurred losses amounting to 310.218 million. SKK (10.296 mil. €).

In total, the floods affected 188 villages and towns where 1,675 houses (cellars, basements) were flooded. Floods damaged 56 administrative buildings, schools and health care facilities, 43 factories, warehouses and operations, 643 water resources, 2833.9 hectares of farmland, 204.3 hectares of forest land and 440.806 hectares of urban areas. Floods damaged 7.715 km of water supply systems, 2.949 km of sewerage systems, 138.051 km of river bank protections and 3.695 km of flood protection dikes. The floods affected a total of 10,742 inhabitants, including 691 people evacuated.

Financial consequences of floods in 2002 – 2008

Table no. 9.1.1

Floods - year	Number of municipalities affected by floods	Flooded areas in hectares	Flood damages in million SKK	Costs in million SKK		Total costs and damages in million SKK
				Rescue operations	Protection operations	
2002	156	8,678.0	1,525.7	58.1	50.1	1,639.90*
2003	41	744.0	43.9	5.7	4.2	53.79
2004	350	13,717.0	1,057.4	37.2	103.4	1,198.04

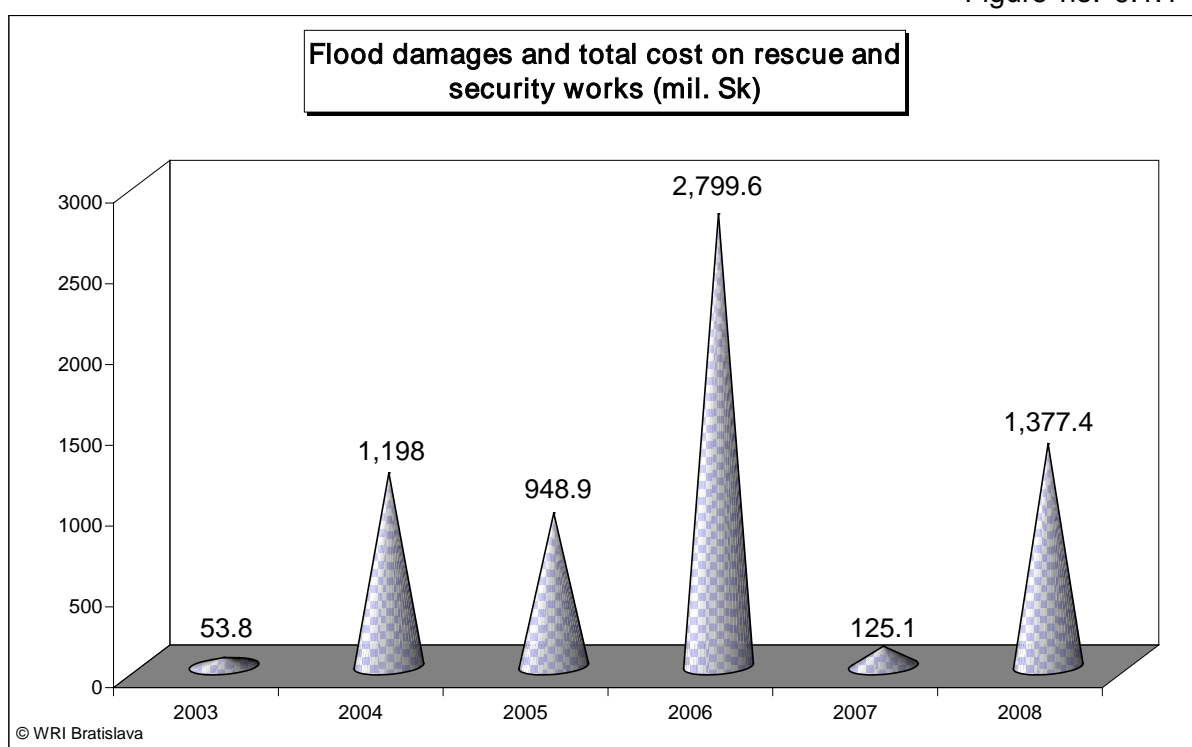
Floods - year	Number of municipalities affected by floods	Flooded areas in hectares	Flood damages in million SKK	Costs in million SKK		Total costs and damages in million SKK
				Rescue operations	Protection operations	
2005	237	9,236.8	800.5	67.8	80.6	948.92
2006	512	30,729.7	2,425.9	180.3	193.4	2,799.64
2007	60	339.5	109.6	9.1	6.4	125.11
2008	188	3,570.0	1,193.5	108.0	75.8	1,377.3

Source: Reports on floods in Slovakia in 2002, 2003, 2004, 2005, 2006, 2007, 2008 (Ministry of Soil Management of the Slovak Republic, Ministry of Environment of the Slovak Republic)

* amount of 6.0 million SKK – costs for mosquito insecticide is included

The total flood damages together with costs for rescue operations and protection measures in 2002 – 2008 are shown in figure no. 9.1.1.

Figure no. 9.1.1



9.1.1 Flood Protection Programmes

Flood Protection Programme in the Slovak Republic by 2010

The programme adopted by the government of the SR is not covered by the financial resources in variant of the 20.766 billion SKK (in Water management 18.415 billion SKK).

The Slovak Water Management Company, state enterprise used in total 4, 640.252 mil. SKK from the Programme of flood protection by the end of 2008, while the total difference between timetable and reality (16,981.375 million SKK) was – 12,341.123 million SKK. In 2008 these works were done within the programme in the amount of 815.693 million SKK, of which in total 363.956 million SKK were incurred from EU funds, 350.668 million SKK from the state budget and 101.069 million SKK from the own resources SWMC, š. p.,

Floods warning and forecast system (POVAPSYS)

The activities of the POVAPSYS project in 2008 were focused on operation and preparation of supporting documents for elaboration of a request with annexes according to the requirements of the Operation programme Environment on providing non-refundable financial contribution from the EU funds for POVAPSYS-2A.

A continuous operation of production and distribution of hydrological forecasts and warnings for the state administration and crisis management has been ensured (collection and processing of complex data from the observational network of automatic telemetric stations, control and securing information from automatic telemetric stations, regular generation and broadcast of radio-localisation products for the needs of POVAPSYS).

In accordance with concluded agreements maintenance of office software equipment, installation of automated ground stations and transfer of data into 4 regional collection centres has been done, then their transfer via the telecommunication network into surveillance centre in Bratislava

Financial resources provided from the transfer of the Ministry of Environment of the Slovak Republic in the amount of 32.500 million SKK were used in accordance with the task fulfilment POVAPSYS. The missing financial means necessary for reconstructions, and maintenance were used continuously from earnings.

Operation Programme "Environment" for the years 2007 - 2013

The Operation Programme "Environment" (OPE) represents a programme document of the Slovak Republic for provision of financial assistance from the EU funds for environment for the years of 2007 – 2013. OPE is based on the results of the current environmental situation analysis of the SR, the requirements arising from the environmental acquis, including the transitional periods provided for Slovakia in the Accession Treaty to the EU, existing EU legislation and international conventions on environment as well as the EU legislative measures currently being prepared. Their adoption is expected during the programming period 2007 - 2013 and will need to ensure their financial implementation. OPE is financed jointly by the European Regional Development Fund (ERDF) and Cohesion Fund (CF). The priority axis 2 deals with Flood protection.

The total eligible expenses of the projects approved within the 1st Call represent 322.743 million SKK (10.713 million €).

Investment projects for flood protection constructions prepared for the 2nd Call represent 846.930 million SKK (28.114 million €).

Investment projects for flood protection construction and flood risk management plans for the 3rd Call represent 904.557 mil. SKK (29.943 million €).

The main focus of *Operational Objective 2.1 Preventive Measures on Flood Protection* is to significantly decrease damages caused by floods by implementing preventive measures on flood protection, limit human activities caused by adverse impact on discharge conditions in river-basin influences and secure natural capacity of water accumulation by river-basin recovery.

The main focus of the *Operational Objective 2.2 Creation of Flood Warning and Forecasting System* is to complete the development of the Flood Warning and Forecasting System (POVAPSYS) by 2010 in accordance with the Flood Protection Programme of the Slovak Republic.

9.1.2 Action Programme of Sustainable Flood Protection in the Danube Basin

Implementation of the ICPDR Action Programme of Sustainable Flood Protection

The International Commission for the Protection of the Danube River (ICPDR) adopted the Action Programme of Sustainable Flood Protection in the Danube River Basin (further referred to as the Action Programme) on the 7th Conference of Ministers of the Member States responsible for Water Management held in Vienna on December 14, 2004.

The Implementation of the Action Programme in the Danube river basin is one of the topics at the agenda of Expert Working Group (further referred to as "EG") "Flood Protection" within ICPDR, in which Slovakia was represented by the Ministry of Environment of the Slovak Republic, Slovak Water Management Enterprise, Slovak Hydro-meteorological Institute and Water Research Institute.

The POVAPSYS project objectives are in compliance with the Action programme.

The activities related to the Action Programme of sustainable flood protection in the Danube river basin included mainly the following construction projects:

- Bratislava – Flood protection
- Dike regulation Malina, 2nd phase
- Dike regulation Malina, 3rd phase
- Dike reinforcement Morava km 89.5 – 97.05, 2nd phase
- Reconstruction of left protection dike Hrona Malá nad Hronom in 0.0 – 2.900 km
- Reconstruction of water guard house in Štúrovo
- Reconstruction of flood protection line in Štúrovo
- Komjatná - Komjatná brook regulation
- Krajné - stream Jablonka, flood protection measures in the area of municipality
- Dvorec – Inovec river training
- Nové Zámky – increasing of left-sided flood protection dyke Nitra in 6.466-7.795 km
- Radôstka - Radôstka stream regulation
- Korňa – Korňanka stream remodelling
- Žilina - Trnové, Trnovka stream regulation
- Trenčianska Turná - Hukov stream regulation
- Žilina - Rosinka, Rosinka stream regulation
- Waterworks Orava - reconstruction
- Waterworks Kráľová – reinforcement of left dike
- Čadca – Rieka stream regulation
- Pribylina – Račková stream regulation
- Gauging Station Môt'ová, providing stability of dam body
- Kokava nad Rimavicou, Rimavica stream regulation
- Water construction Kolpašská - reconstruction /providing stability of dam body/
- Brezno, regulation of discharge conditions in Kabátovský potok, r. km 1.182 – 1.583
- Banská Bystrica - Rakytovce, regulation of the Rakytovský stream
- Šahy - Homok, flood protection measures on Nemcov stream, r. km 0.000-0.479
- Šahy - Preseľany upon Ipeľ, protection measures for Kamenec stream
- Rudná, flood protection measures on the Stankovička stream, r. km 1,500.00 – 1,724.50
- Žihľava - Pôtor, regulation of Old river/ Stará rieka, r. km 9.450-9.810

- Šarišské Sokolovce – regulation of Veľký potok
- Nižný Klatov – regulation of the Nižnoklatovský potok
- Koškovce – reconstruction of the right dam Laborec
- Borša – reconstruction of polder.

9.1.3 Directive of the European Parliament and of the Council 2007/60/EC on the Assessment and Management of Flood Risks

The Directive 2007/60/EC of the European Parliament and the Council on the Assessment and Management of Flood Risks as of October 23, 2007 was published on November 6, 2007 in the Official Journal of the EU under the number L 288/27 in Volume 50 and came into force on November 26, 2007.

The objective of the Directive is to establish a legal framework for assessment and management of flood risks with the aim to reduce adverse effects of floods on human health, environment, cultural heritage and economic activities related to floods.

In January 2008 transposition of the Directive 2007/60/EC of the European Parliament and the Council on the Assessment and Management of Flood Risks into the Act 666/2004 Coll. on Flood Protection has been initiated and consequently to the generally legal binding regulations arising from the Act 666/2004 Coll.

9.2 Control Activity in Water Protection and Dealing with Emergency Water Quality Deterioration

The audit by the Water Protection Inspection (WPI) on behalf of Environmental Inspectorates, which falls under the Water Act, was focused primarily on inspection and adoption of preventive measures plans to prevent hazardous substances to be released into environment, and the procedure in case of escape – emergency plan. 554 inspections were done within the assessment of completeness and topicality of emergency plans. Inspection with NBL was done in 214 cases. In relation to the emergency water deterioration 242 inspections have been done and 199 inspections were focused on water management, operation and effectiveness.

379 (28.2 %) cases of law violation was reported from the total number of 1,341 inspections in 2008.

An overview of number of inspections carried out in the years 2005 - 2008, when a violation of the law was reported, is indicated in the table no. 9.2.1.

Table no. 9.2.1

Water Protection Inspection in	Act 364/2004 Coll.		Act 261/2002 Coll.		Act 163/2001 Coll.		Total	
	Number of inspections	Law violation	Number of inspections	Law violation	Number of inspections	Law violation	Number of inspections	Law violation
2005	1,467	332	43	4	4	0	1,514	336
2006	1,713	436	43	4	32	3	1,788	443
2007	1,567	356	59	5	11	0	1,637	361
2008	1,291	375	40	4	10	0	1,341	379

Emergency Water Quality Deterioration

102 cases of emergency water quality deterioration were reported by the Slovak Environmental Inspection (SEI).

Overview of reported cases in the years 2005 - 2008

Tab. no. 9.2.2

Year	Emergency water quality deterioration						
	Number of reported cases	Surface			Groundwater		
		Total Number	Rivers and reservoirs	Boundary rivers	Total number	Pollution	At risk
2005	119	66	2	5	53	2	51
2006	151	94	1	3	57	6	51
2007	157	97	1	4	0	4	56
2008	102	49	0	6	53	4	49

The most frequent cause of emergency water deterioration was transport, where oil substances were used in 65 cases (63.7 %), waste waters in 15 cases (14.7 %) and agricultural fertilisers in 7 cases (6.8 %). A pollutant was not identified in 6 cases (5.8 %).

The operation of the Communication Unit of the Basic International Warning Centre (PIAC 4) Slovakia was activated 5 times within the System of Early Warning in the Danube River Basin.

Based on public requests concerning environmental pollution, planned control operations and regular checks have been done. Detailed information concerning quality control and its evaluation is indicated in the annual reports of respective regional environmental authorities.

Based on emergency water quality deterioration the Communication Unit of the Basic International Warning Centre Slovakia (PIAC 04) within the System of Early Warning in the Danube River was not activated.

Testing of functionality of communication units PIAC to receive, confirm and send all types of messages used within the System of Early Warning within the Danube River was performed, which was initiated by the Secretary of the International Committee for Danube protection with the seat in Vienna.

10 ECONOMIC ANALYSIS OF WATER USE AND MANAGEMENT OF WATER SECTOR

Slovak Water Management Enterprise, state enterprise, Žilina

The Slovak Water Management Enterprise, state enterprise, reached in 2008 profit of 57.688 million SKK, which represents increase by 55.142 million SKK compared to I. plan amendment.

The total profits in 2008 amounted to 3,766.756 million SKK. Compared to I. plan amendment and budget for the year 2008 the profits were higher by 141.645 million SKK. In percentage share it is excess of the planned amount of the total profits by 4 %. Compared to 2007 profits rose to 28 %.

The decrease of profits was recorded in the item of energetic water by 59 thousand SKK, sale of grass stand from wooden material decreased in 85 thousand SKK, profits of water-management in 180 thousand SKK.

The costs amounted to the total amount of 3,709.068 million SKK, which represents an increase by 86,503 thousand SKK compared to the plan for the same period.

Production of surface water

By the Decision of the Regulatory Office for Network Industries No. 0002/2008/V as of October 29, 2007 the unit price for the surface water was set at 2.51 SKK. m⁻³. In terms of the Water Act, with effect as from July 1, 2004 collected irrigation water for agricultural land shall not be charged.

The total abstraction of surface water in 2008 represents the fact in physical units of 295,920 thousand m³ with a value of 742,752 thousand SKK. In comparison to the plan in 2008 abstraction was higher by 5,495 thousands m³, which in financial terms, represents an exceeding by 18.8 million SKK.

Water Management Construction, state enterprise, Bratislava

The Water Management Construction (WMC), state enterprise, reached good economic results, which were evidence of good decision-making of management, as well as national authorities. In 2008, the WMC also achieved a positive economic result. This favourable position and good adjustment of expenses throughout the year contributed to the stability of financial management. The WMC was able to ensure safe and smooth operation of all water constructions in Gabčíkovo and Žilina, pay all its obligations towards the State, as well as finance its activities by own resources.

All profits made by the WMC in 2008, according to the Slovak accounting standards are in the amount of 4,550.303 million SKK. To achieve profits, costs were incurred in total of 3,746.478 million SKK. Compared to the previous year it represented an increase of 13.54 %.

The costs amounted to 3,746.478 million SKK and grew by 3.87 %. The key business costs are those incurred for the purchase of electricity, the costs for services and asset depreciation. The financial costs were drawn in the amount of 413.395 million SKK. In 2008, the costs from economic activity accounted for 3,042.674 million. SKK and compared to 2007 they rose by 4 %. According to the international accounting standards, achieved profits accounted for an annual increase of 0.15 %. The costs in the amount of 3,201.191 million SKK were incurred and grew by 28.49 % compared to the previous year.

Hydroconsult, state enterprise, Bratislava

The total profit of Hydroconsult amounted to 11.603 million SKK. Compared to the previous year the profit has been increased by 13.915 million SKK. This resulted mainly from the increase of own performance as well as of decrease of sold subdeliveries including unfinished production. For 2008 Hydroconsult profits were in the amount of 11.680 million. SKK, which is by 7.400 million SKK less than in 2007.

Hydroconsult was not solving any governmental tasks.

The prevalent number of contracted orders was in 75 % for project preparation and documentation for building permission. The priority tasks were „Flood Protection Bratislava“ and „Water Supply and Implementation of Sewage System for Municipalities in the Micro-Region Hornád – Slanec“.

All operational costs were not covered by own production (own revenues) and a loss was reported. Approximately 98 % of contracted orders implemented in 2008 were acquired at the market of projection works outside enterprises under direct administration of the Ministry of Environment of the SR.

Water Companies

Infrastructural property of public water systems and public sewage systems was operated by 14 water companies and other subjects, which provided information to administrator of the Report on Water Management of the Slovak Republic in 2008. All subjects were included into the overview of indicators.

Earnings from selling their own products and services in individual water companies decreased compared to 2008 by 150 million SKK. Economic result after taxation represented in comparison to 2007 a decrease by 90 million SKK.

The costs compared to 2007 show a decrease by 202 million SKK. Depreciations were increased by 276 million SKK. A decrease by 703 million SKK was recorded at providing tangible and non-tangible investments, including a decrease by 1,289 million SKK in own resources.

Water companies in 2008 produced 287,864 thousand m³ of water in their own equipment. Invoiced drinking water represented 68.0 % of 195,837 thousand m³. The difference between water produced and water invoiced is 92.027 million SKK, which points to a considerable drinking water losses.

In comparison to the previous years it is possible to positively assess a decreasing trend of liabilities/ claims, which shows increasing of payment discipline of individual customers.

An overview on achieved economic results for individual groups of state enterprises and water companies and other subjects providing drinking water supply and waste water discharge, which is provided in the table 10.1.

[mil. SKK]

Table no. 10.1

Indicator	Year	Water companies	SWME	Other companies	Total water management
Revenues	2007	11,883	2,934	4,033	18,850
	2008	11,733	3,767	4,562	20,062
	Index 2008/2007	0.99	1.28	1.13	1.06
Expenditures	2007	11,645	3,913	3,631	19,190
	2008	11,443	3,709	3,763	18,915
	Index 2008/2007	0.98	0.95	1.04	0.99

Indicator	Year	Water companies	SWME	Other companies	Total water management
Net income after taxation	2007	294	-979	402	-283
	2008	204	58	799	1,061
	Index 2008/2007	0.69	-0.06	1.99	-3.75

10.1 Effect of Economic Tools

Drinking and Waste Water Pricing

Prices for drinking water production, distribution and supply by public water supply in 2008 increased compared to 2007 in average by 5.65 % and for waste water discharge and treatment by public sewage system by 5.16 %. Prices for drinking water production, distribution and supply by public water supply and for waste water discharge and treatment by public sewage system in total increased in 2008 on average by 5.42 % compared to 2007, while represented approximately price level of 2006. In total maximal water charges for municipal sewage network set for the year 2008 was in the range from 43.50 to 52.00 SKK/m³ without VAT. The price increase was caused, despite applying regulation measures, mainly by increasing costs for energy, authorised maximal grow of personnel costs, applying eligible costs related to fulfilment of obligations of the regulated subjects, which result from legislative regulations, but mainly by the decrease of specified water consumption, and water amount supplied and diversified.

The trend of decrease in the quantity of drinking water is continuing by public water supply and wastewater sewerage system. The reason for this unfavourable situation is, among other factors, the fact that while new water or sewerage networks are being built, building connections to end-users of drinking water, waste water producers are missing. To eliminate this condition a regulatory action was taken, which makes the regulated entities to use the capacity building of water management equipments (operating costs are calculated at newly built water facilities for at least 70 % of their projected capacity).

Drinking water

Table no.10.1.1

	Unit of measurement	2004	2005	2006	2007	2008
Eligible costs	Million SKK	4,874	4,876	5,393	5,488	5,215
Drinking water supply	tis.m ³	233,675	223,064	216,569	216,516	210,580
Average eligible costs	SKK.m ⁻³	20.86	21.86	24.91	25.35	18.08
Average price (without VAT)	SKK.m ⁻³	17.72	22.88	25.18	24.58	26.06
Price for the households (without VAT)	SKK.m ⁻³	18.45	21.96	25.41	25.09	26.31
Average price for others (without VAT)	SKK.m ⁻³	25.41	24.81	24.88	23.12	25.70

Waste water

Table no. 10.1.2

	Unit of measurement	2004	2005	2006	2007	2008
Eligible costs	mil. SKK	3,271	3,536	5,394	4,102	3,897
Volume of wastewater	thous.m ³	216,920	240,619	205,751	208,991	186,870
Average eligible costs	SKK.m ⁻³	15.08	14.70	18.66	19.63	20.85
Average price (without VAT)	SKK.m ⁻³	16.03	17.04	21.39	20.61	22.31
Price for the households (without VAT)	SKK.m ⁻³	11.42	15.75	20.87	20.50	22.23
Average price for others (without VAT)	SKK.m ⁻³	22.61	18.39	22.18	20.84	22.49

Figure no. 10.1.1

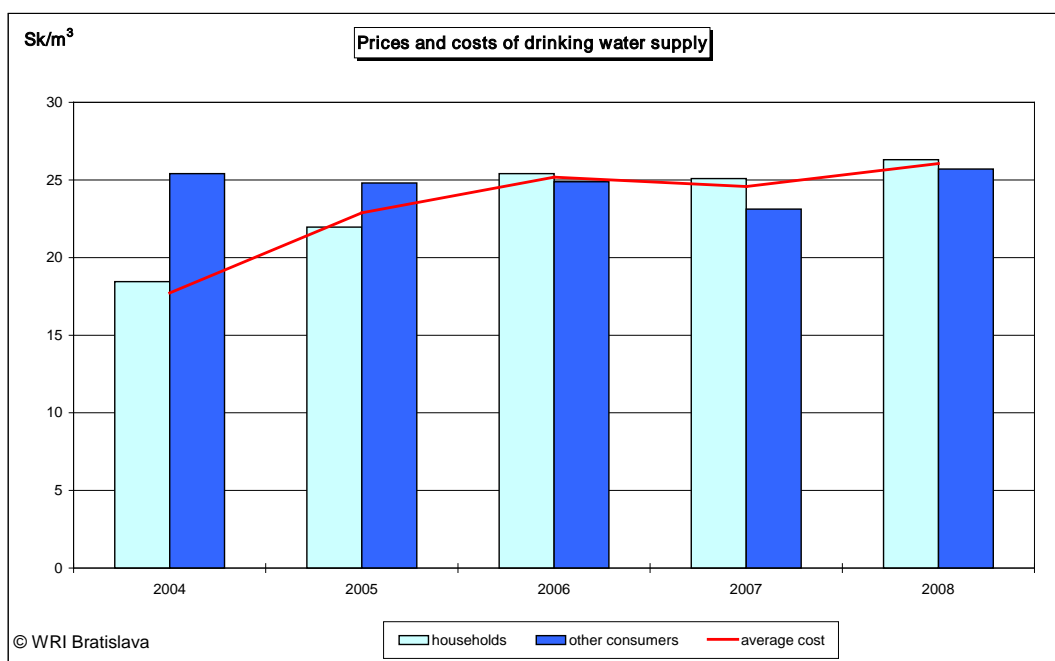
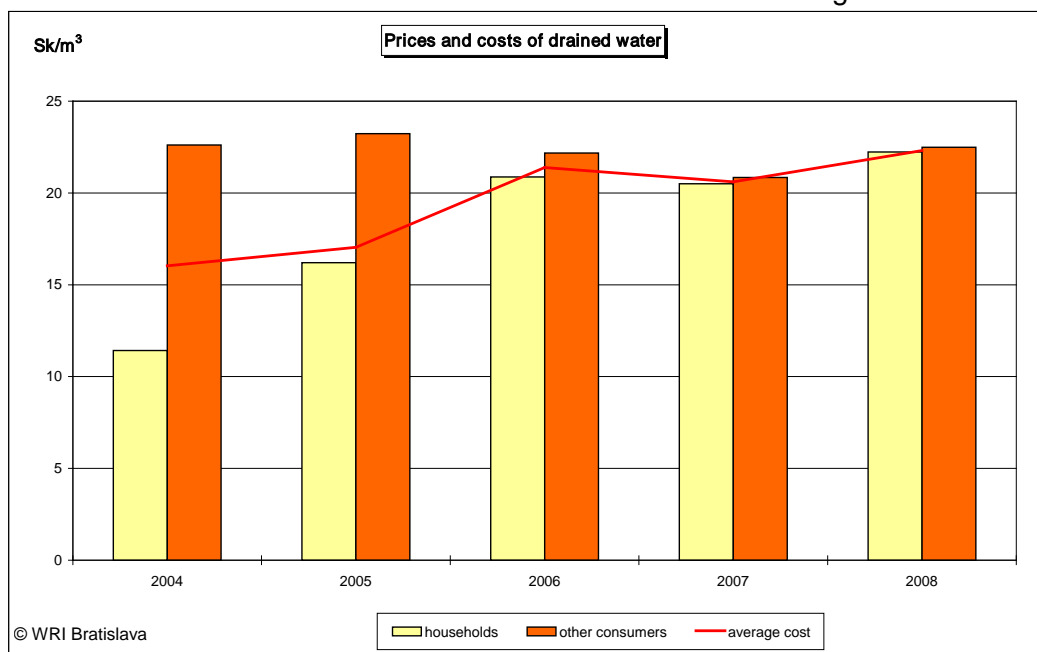


Figure no.10.1.2



Payments for Providing Water Management Services related to Usage of Surface Water

The Regulatory Office for Network Industries of the Slovak Republic has been determining the payments for usage surface water since 2005 in line with the governmental Regulation SR 755/2004 Coll. and 367/2008 Coll. and according to the Water Act, which determines payments subject to price regulation.

The SWME Žilina is dominant regulatory subject with monopoly position executing regulatory activities in this area.

The Regulatory Office for Network Industries determined by the Decision for 2008 the following:

- Maximum price for surface water abstraction in the amount of 2.51 Sk/m³, which was an increase by 11 % compared to 2007;
- Price for use of hydropower potential of water courses at hydraulic structures administrated by a water course administrator when the installed output is higher than 100 kW as tariffs to support smaller producers of electricity, the users of hydropower potential from 100 kW to 1,000 kW at 126 SKK / MWh, from 1,001 kW to 10,000 kW at 210 SKK / MWh and more than 10,000 kW at 427 SKK / MWh;
- Average price for use of hydropower potential of water courses increased by 8 % compared to 2007;
- Fixed price for abstraction of energetic water at hydraulic structures owned by the user of hydro-energetic potential of the water course when the installed output is higher than 10 MW in the amount of 0.0027 SKK/m³, whereby compared to the previous year the price has decreased by 10 %.

The procedure of price adjustment for providing water services related to the use of water course for 2009 was regulated by the Decree 5/2008.

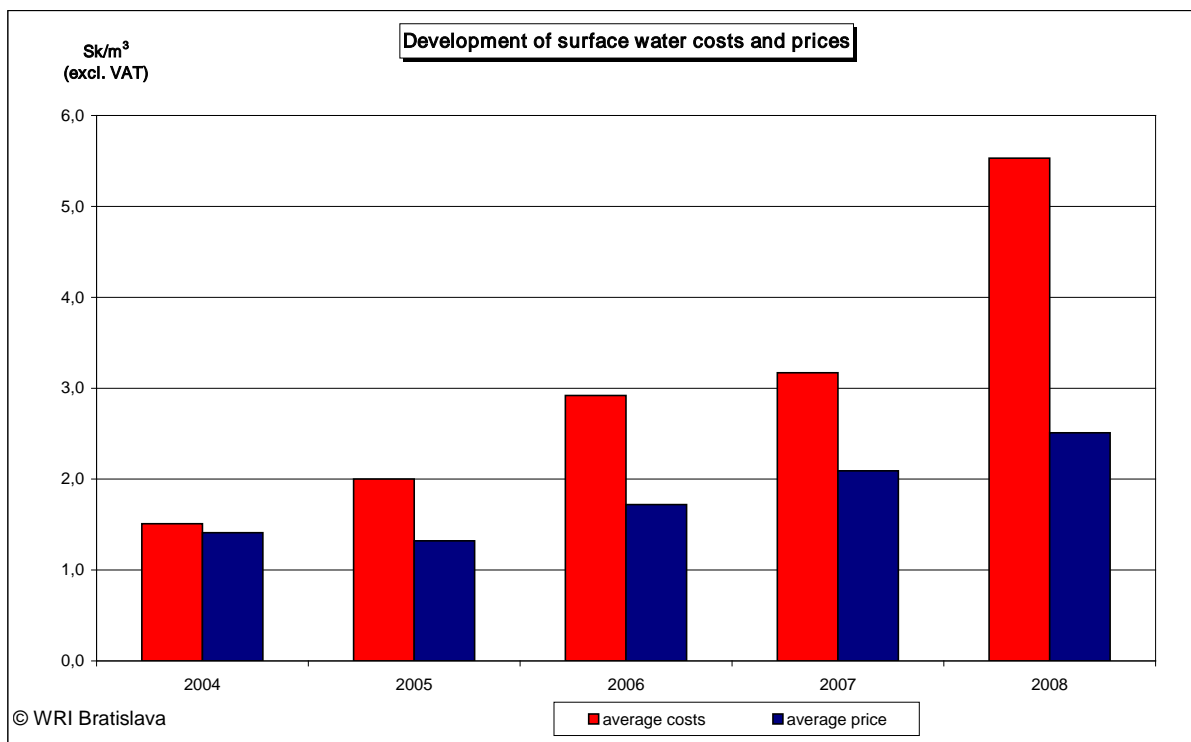
Despite implementation of rationalization and regulatory measures, higher growth of prices for water services in 2008 causes relatively constant and significant decline in water abstractions in all regulated water services.

Price Development for Surface Water out of Revenues (without VAT)
In the years 2004 - 2008 for SWME, Žilina

Table no. 10.1.3

	Unit of measurement	2004	2005	2006	2007	2008
Average costs	Sk.m ⁻³	1.1	2.00	2.92	3.17	5.53
Average price	Sk.m ⁻³	1.41	1.32	1.72	2.09	2.51

Figure no. 10.1.3



Taxes

In the assessed period, immovable property and land tax increase has been increased. A decrease was recorded in Value added tax, Construction tax, Road tax and Legal Entity Income Tax.

The range of tax burden by individual types of taxes can be seen in the following table.

[thous. SKK]

Table no. 10.1.4

Taxes	2004	2005	2006	2007	2008	Index 2008/2007
VAT (Value Added Tax)	291,370	1,168,971	933,546	625,838	596,261	95.27
Real Estate Tax	17,225	47,930	41,667	41,249	44,408	107.66
Of which: Land Tax	3,503	24,923	24,223	23,119	25,745	111.36
Building Tax	14,131	13,844	16,744	18,131	18,048	99.54
Road Tax	25,100	27,568	28,513	30,659	28,896	94.25
Legal Entity Income Tax	162,507	119,337	119,117	656,764	639,774	97.41

Loans

Bank loans and aids were increased compared to 2007 by the amount of 439.572 million SKK and long-term bank loans amount to 2,877.661 million SKK compared to 2007 were increased by 798.074 million SKK. Current bank loans amount to 723.855 million SKK compared to 2007 they were decreased by 486.917 million SKK.

[Thousand SKK]

Table no. 10.1.5

Loans	2004	2005	2006	2007	2008	Index 2008/2007
Bank loans and aids	8,006,287	9,236,752	3,336,404	3,161,943	3,601,515	113.90
Of which: long-term bank loans	7,540,767	8,635,023	2,354,211	2,079,587	2,877,661	138.38
Current bank loans	465,520	601,729	982,193	1,210,772	723,855	59.78

10.2 Labour Force, Salaries

Average annual registered number of employees by December 31, 2008 in state water management enterprises and water companies was 11,410. Compared to the previous year this number represents a decrease by 1,414 employees. The number of employees decreased mainly in water companies (1,149 employees) and the Slovak Water Management Enterprise (214 employees) and other subjects in the number of 51 employees.

The average salary in water management has been increased by 1,699 SKK compared to 2007 and in water companies by 1,026 SKK. Labour productivity from profits in water management has been decreased by 288 thousand SKK.

The overview of number of employees and emolument indicators in water management (WM) state enterprises and water companies is indicated in the table 10.2.1.

Table no. 10.2.1

Indicator	2004	2005	2006	2007	2008	Difference 2008- 2007	Index 2008/2007
Total Water companies employees	9,179	8,833	8,736	8,638	7,489	-1,149	0.87
Total SWME employees	4,149	4,129	4,097	3,922	3,708	-214	0.95
Other enterprises employees (WMC+HYCO)	301	285	281	264	213	-51	0.81
Total WM employees	13,629	13,247	13,114	12,824	11,410	-1,414	0.89
Average salary in WM total (SKK)	16,689	18,404	20,291	21,731	23,430	1,699	1.08
Average salary in Water companies total (SKK)	16,005	17,858	19,546	20,756	21,782	1,026	1.05
Labour productivity of revenues in WM (thous. SKK/head)	1,155	1,347	1,538	1,470	1,758	288	1.20

10.3 Capital Constructions and its Financing in Water Management Sector

The **Slovak Water Management Enterprise, state enterprise** provided in 2008 capital transfers for investment constructions in the amount of 311.700 million SKK, which were used for 28 investment activities in water management.

The own financial resources in the amount of 264.937 million SKK were used for financing investment constructions.

The investment activities financed by the resources from the EU funds were in the total amount of 374.939 million SKK and the amount of 47.893 million SKK was provided by the state budget to co-finance the projects.

The total volume of investments in constructions represented 1,000.487 million SKK.

The **Water Management Construction, state enterprise** used its own resources in amount of 462.171 million SKK. They were used mainly for areas SVD G-N and water work Žilina.

The Water Management Construction, state enterprise was dealing with projects in mandate of the Ministry of Environment of the Slovak Republic – preparation of state orders of the selected water management projects, which were financed from their own resources. During 2008 works on preparation of projects continued – water reservoir Tichý Potok and water work Slatinka.

Water companies used investments in the amount of 3,720.214 million SKK:

Constructions of water pipes and sewage system were financed in the amount of 3,948.984 million SKK.

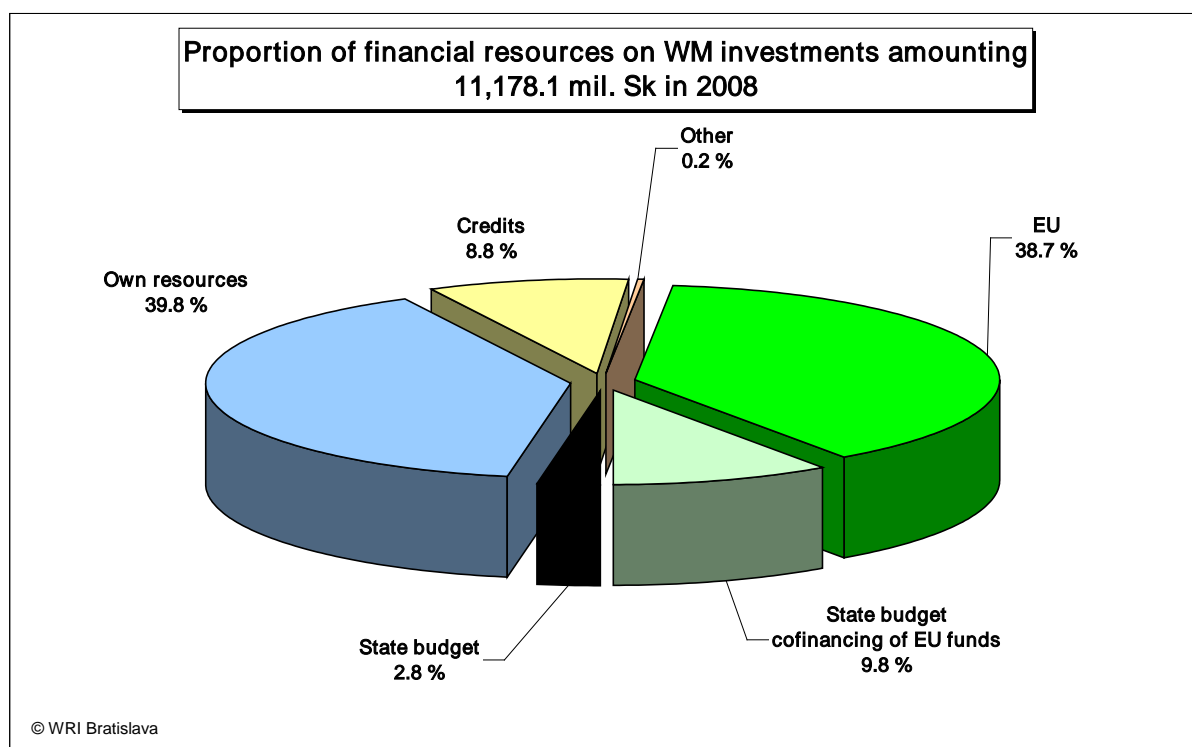
Investment activities in amount of 1,041.996 million SKK were co-financed by the state budget.

An overview of investment constructions financial resources in the years 2007 and 2008 is indicated in the following table and figure no. 10.3.1.

Table no. 10.3.1

Financial resources (in mil. SKK)	Slovak Water Management Enterprise		Water companies and others		Water Management Construction		Total Water Management	
	2007	2008	2007	2008	2007	2008	2007	2008
State Budget (SB)	50.0	311.7	-	-	-	-	50.0	311.7
Own resources	511.7	265.0	3,719.3	3,720.2	392.5	462.2	4,623.5	4,447.4
EU funds	27.3	374.9	2,904.6	3,949.0	-	-	2,931.9	4,323.9
Co-financing of SB to EU funds	5.0	47.9	764.0	1,042.0	-	-	769.0	1,089.9
Loans	-	-	677.7	988.1	-	-	677.7	988.1
Others	-	0.9	40.5	16.2	-	-	40.5	17.1
TOTAL	594.0	1,000.4	8,106.1	9,715.5	392.5	462.2	9,092.6	11,178.1

Figure no. 10. 3. 1



11 OVERVIEW OF RIVER BASIN MANAGEMENT PLANS AND PROGRAMMES

River Basin Management Plans

In terms of § 12 of the Water Act amendment (at present in the legislation adopting procedure) the following documents are elaborated in the SR:

- river basin management plans – for the administrative area of the Danube riverbasin (partial riverbasin Danube, Morava, Váh, Hron, Ipeľ, Slaná, Bodrog, Hornád and Bodva) and administrative area of the Vistula river basin (partial riverbasin the Dunajec and Poprad)
- and the Water Plan for Slovakia

In case of international river basins elaboration of common water management plan is required. Therefore plans for international river basin of the Danube and its sub-basin Tisa. For international Vistula river basin a common plan is not being processed. Individual water river basin management plans differ in level of detail. The most thorough are the water river basin management plans of partial river basins of the Slovak Republic and international river basin plans are the least thorough (the Danube and its sub-basin Tisa) The deadline for river basin management plans for the first planning cycle is December 22, 2009.

The first working version of the Draft on River Basin Management Plans of the Slovak Republic (January 23, 2009 – July 23, 2009) is now available on the website www.vuvh.sk/rsv ready for submission to written comments, the active participation and public consultation of water users, administrative regions, municipalities and governmental bodies concerned. Based on the results of comments and consultation, it will be completed in

the final form and submitted for approval. In terms of the Water Act amendment river basin management plans are adopted by the Ministry of Environment. Adopted plans for river basin management are the basis for the development of Slovakia's Water Plan and its Programme of Measures approved by the government of the Slovak Republic. The binding part will be issued by a Regulation. A copy of the adopted Slovak Water Plan shall be sent to the European Commission via the Permanent Representation of the Slovak Republic to the EU in the period by March 22, 2010.

Flood Risk Management Plans

In terms of § 5 of the draft with new wording of the Act on flood protection (at present in legislative process), the flood protection risk river basin management plans are elaborated according to the partial river basin management plans of the Vistula.

These plans are part of the set of international flood protection risk management plans and their elaboration is co-ordinated on international level. They are coordinated on level of international river basin of the Danube in the administered area of the Danube river basin and on level of international river basin of the Vistula within the administrative area of the Dunajec and Poprad.

For elaboration of the first plans of flood protection and flood risk management plans the deadline of December 22, 2015 has been set. Their evaluation and updates will be done in six year cycles co-ordinated with assessment and updates of river basin management plans.

The Flood risk management plan becomes a part of respective administrative river basin area after having been adopted.

The elaboration process of flood risk management plans is being prepared at present.

12 RESEARCH, EDUCATION, ENVIRONMENTAL TRAINING, PUBLICITY AND PROMOTION

12.1 Research

The following tasks and issues were solved within the scientific research activity in 2008 within the ***Water Research Institute Bratislava*** :

– *Scientific-technical projects:*

Waterworks Slatinka; Evaluation of Alleviation Process of the Žilina Water Reservoir Focusing on Section Profiles; Zemplín water way - INTERREG III.A; Flood Threat Maps and Flood Risk Maps in the Domanižanka river basin, 1st part; Hydraulic Calculations of Alternative Flushing of the Left-side Branch System of the Danube; Elaboration of Common Framework Landscape and Water Management Report and Evaluation of Implementation Possibilities and Planning of Particular Elements in the Bodrog Area - INTERREG III. A

-
- *International scientific and technical projects:*
NORMAN; SOCOPE (Source Control of Priority Pollutants in Europe); DINAMICS; CAPACITY BUILDING SUPPORT TO THE WATER SECTOR IN TURKEY, TR 06 IB EN 01
 - *Project acquired within the Operation programme of Environment:*
Water Monitoring in Slovakia
 - *International cooperation based on international agreements:*
Commissions of Danube countries (ICPDR, Danube Commission); Committee on Transboundary Waters
 - *Tasks over the framework of common transfer:*
Incidence study of building tunnel and its impacts on the groundwater flow by connecting the railway corridor TEN-T (Trans European Transport Network) to the airport and railway network in Bratislava; Gabčíkovo Waterworks, Čunovo section – calibration of hydraulic structures; Expertise related to the evaluation of pesticides fate and behaviour in the soil and water
 - *Framework and legislation documents:*
Draft Framework on Use of hydropower potential of rivers in Slovakia; Draft Act amending the Water Act; Draft Act on Flood Protection; Draft Act amending the Act No. 442/2002 Coll. on public water supply and public sewerage systems and amendment to the Act No. 276/2001 Coll. on regulation of network industries as amended by later regulations

In 2008, the National Reference Laboratory (NRL) received 6,988 samples and carried out 108,080 analyses including 88,648 accredited analyses and 19,432 not accredited analyses. Furthermore, NRL dealt with four specific research tasks.

In the authorised metrological workplace of the Calibration Laboratory for Flow and Water Meters 18 water meters for cold water together with 41 flow metres - heat meters were verified and 14 flow metres were calibrated.

136 current meters were calibrated in the accredited Calibration Laboratory for Flow and Water Meters.

In 2008, the WRI solved besides other tasks based on the contract and the Plan of Main Tasks in total 68 own tasks for consumers (companies, enterprising subjects, public administration) within the Slovak Republic. From 68 tasks, 56 tasks were finished and 12 tasks are overlapping into 2009.

18 tasks based on concluded contracts were solved.

Water management maps in the scale 1:50,000 were sold to legal and physical persons interested.

The **Slovak Water Management Enterprise, state enterprise, Žilina** dealt with the following tasks at the national level in 2008:

- Participation in solving tasks set in the timetable and specification of works on implementation of the WFD for 2008 for individual working groups created for this purpose in the process of implementation of the WFD in the Slovak Republic;
- Tasks arising from implementation of other related EU legislation, national, European and international standardisation;
- Processing of statements concerning investment and development focus and to related territorial documentation of regional development;
- Updates of intradepartmental task „Research on watercourses in urban areas of the Slovak Republic“;
- Water Management Balance for 2007 (processing of supporting documents for Quantitative water management balance);
- Processing of supporting documents for the yearbook Data on Water Management Capital Construction and Operation in Slovakia for 2007 as well as for Water Management Journal 2007;
- Preparation of medium-term investment programmes - Investment Development Programme, Programme of Public Works, Programme of Flood Protection in SR, arising from the long-term framework programmes of water plans and other framework water management documents;
- Solving water management development tasks and studies.

International projects solved in 2008:

- Improving flood management and flood protection planning in the river basin of Hornád in the territory of Slovakia;
- Development of the system of contacts between institutions based on international agreements on transboundary waters;
- River Basin Management Plan for Čierna Voda, Project UNDP/GEF: Integration of Principles and Ecological Management and procedures of ecological management into land and water management in East Slovakia (region Laborec - Uh); implementation of the document;
- Project UNDP/GEF: Integration of Principles and Ecological Management into Land and Water management Procedures in East Slovakia (region Laborec - Uh); preparation of supporting documents for sub-project: „Room for water in the Bodrog river basin“;
- Project WACO – in co-operation with the Dutch experts.

Research-development activity of the **Slovak Hydro-meteorological Institute Bratislava** was aimed at applied research in 2008.

The following research tasks have been dealt with:

- Assessment of groundwater resources Slovakia
- Determination of values for environmental standards of water quality

-
- Implementation of the WFD – Classification of surface waters and reference conditions
 - Satellite application for hydrology

International hydrological standards were transposed into national ones in the area of technical standardisation.

Results and conclusions have been presented within the „Improving system of river basin management“ within the common Hungarian-Slovak-Ukrainian Programme (INTERREG III B CADSES/TACIS).

The Resolution No. 817/2008 has been approved and the Memorandum of Understanding between the government SR and the Secretariat of the European Economic Committee UNO on the International Centre on water assessment IWAC has been signed. This activity is related to the location of IWAC Secretariat at the Slovak Hydro-meteorological Institute.

A significant part of international co-operation represented fulfilment of commitments within the Economic Commission for Europe UNO, Environmental programme UNO, the European Commission, UNESCO, Association of Research Institutes in the Area of Fresh Water and International Commission for Water Protection of the Danube River.

The main tasks of the Hydrological service in 2008 were these activities:

- providing performance of the Sub-Monitoring System - Water,
- processing documents for water management balance,
- management of General Register on Waters,
- issuing hydrological data, assessment and expertises on water amount and quality,
- issuing expertise assessment for plant protection,
- technical standardisation in hydrology (in the competence of the ME SR),
- preparation of the Decisions on approval of utilizable capacity of groundwater,
- establishment and administration of the National register of pollution,
- providing data and reports for EC and on basis of the Act on free access to information,
- cooperation in the preparation of water management legislation,
- international and national projects aimed at assessment and forecasts of water regime development, water balancing and water management, as well as preparation of supporting documents for adaptation measures in consequence of possible climate changes.

12.2 Education, Environmental Training

In 2008, within methodical and training activities the **Water Research Institute Bratislava** experts prepared the following trainings for employees of the Slovak Water Management Enterprise, state enterprise, water management enterprises in Slovakia and other persons interested in training, courses and workshops.

The WRI was organiser or co-organiser of the following expert conferences:

- Conference on the occasion of the World Water Day „Let us protect water – water will protect us“, co-organised,
- Conference HYDROCHÉMIA 2008, organised by the WRI,
- „XV. Consultations days of employees of the radiochemical laboratories from the Czech and Slovak Republic“, Červený Kláštor, organised by the WRI,
- „XV. Consultation days of employees of water management in radiological laboratories“, Červený Kláštor, organised by the WRI,
- „XI. Drinking water“, Trenčianske Teplice, conference co-organised,
- 5th conference with international participation: „Waste water“, Vysoké Tatry,
- 40th Conference of water managers in industry, co-organised.

Environmental education was provided by the **Slovak Water Management Enterprise, state enterprise, Žilina** by executing the following activities in 2008:

- involvement of expert employees in the activities related to organising the World Water Day and the Open Day,
- presentation of water construction operation, emergency service and flood protection,
- presentation of technology by experts,
- presentation of mobile analytical methods for measurement of indicators pH, conductivity and appliances for water sample abstractions related to monitoring of surface water quality,
- quizzes and presentation for students,
- presentations of employees in electronic media (in radio and TV broadcasting),
- organising press conferences for media,
- publication activity of employees,
- examiner's reports,
- publishing own periodicals (e.g. a journal issued by the Slovak Water Management Enterprise Piešťany („Hlas Váhu – The Voice of Váh River “).

The **Slovak Hydro-meteorological Institute Bratislava** supports development of human resources in all educational categories. In 2008, 16 employees continued and two employees started the postgraduate studies, 4 employees successfully completed PhD thesis and one of them graduated. Is a member of the Association of Employers in Water Management, is represented in the Slovak Committee for Hydrology, Department for Water Management of the Slovak Academy for Agricultural Sciences, Slovak Meteorological Society, Slovak Bioclimatological Society and GWP Slovakia. It closely co-operates with the Slovak Water Management Society and the Association of Hydrologists in Slovakia.

It has its own Scientific Council, which acts as an advisory body to the management, and is involved in organising scientific events: seminars, conferences, methodological consultations, competitive events - conferences for young hydrologists, water managers, workshops on the occasion of the World Water Day, workshops related to projects solution. SHMI also organises events within the Week of Science in Slovakia.

The results of the research and operational activity presented of different publications.

The SHMI establishes active contacts with Universities, the Slovak Academy of Science and departmental research institutes with the same or similar scope.

The library of the SHMI serves to its employees as a basic information source for their professional activities and dissemination of expert knowledge.

In 2008, environmental education by the **Slovak Environmental Agency Banská Bystrica** included the following activities:

- ENVIROFILM - XIV. International Environmental Film Festival;
- Services of environmental library;
- Practical environmental education - lectures, conferences and workshops were organised for co-ordinators of Environmental education in different places all around Slovakia;
- HYPERICUM was focused on getting to know surroundings and country of birth, nature protection, topography and environmental elements within all the Slovak regions and in the territory, which are involved into the NATURA 2000 network and protected birds' territories.

Camps

The Slovak Environmental Agency organised summer eco-campus with a specialised programme in four Centres of Environmental Education (CEE) of the Slovak Environmental Agency.

- ŠIŠKA – Exposition of Environmental Educational Programmes in CEE Drieňok Teplý Vrch;
- Contest: Children to Nature;
- Living Nature – BISEL. Biomonitoring of flowing surface water in terms of their pollution, coordinated by teachers of elementary and secondary schools according to the EU methodology;
- ProEnviro – Slovak contest;
- EnviroOtázniky – Slovak contest;
- Green school.

12.3 Publicity and Promotion

The Water Research Institute Bratislava published the year-books on the occasion of the following organised conferences and courses:

- Hydrochemistry 2008. „New analytical methods in water chemistry“;
- Microbiological course 2008;
- Basic microbiology in laboratory;
- Hydrobiological course 2008;
- Drinking and surface water (course of sampling).

In scientific (Current Contents) journals 16 scientific works were published, 28 articles in other expert magazines. (http://www.vuvh.sk/index.php/sk_SK/kniznica/kniznica-publikacna-cinnost).

The part of edition and publication activity is purpose-made publication: Report on Water Management in the Slovak Republic (http://www.vuvh.sk/index.php/sk_SK/dok), Lists of Slovak Technical Standards and OTN in water sector.

The *Water Management Journal* as the only comprehensive water management journal in Slovakia has been prepared and edited in the WRI and published by the Association of the Employers in Water Management in Slovakia.

Editorial activities of ***the Slovak Water Management Enterprise Žilina***:

- publishes their own expert materials, e.g. water quality year books, reports on fishing economy, reports on preparation and implementation of projects. e.g. “Floods in Slovakia in 1997-1999 - Elimination of consequences and precautionary measures”, annual reports, periodic press “Hlas Váhu – The voice of river Váh” and “Hlas Povodia – The voice of River Basin”) and other promotional information,
- co-operates with expert journals, e.g. Water Management Journal, Enviro-magazine, Water Management Magazine, etc.,
- promotes presentation activities of their employees at expert conferences and workshops.

Editorial activities of ***the Slovak Hydro-meteorological Institute Bratislava***:

- Expert periodicals: year books, reports, bulletins and assessments;
- Information materials: overview of publication activities by employees of the Slovak Hydro-meteorological Institute;
- Promotional and informational materials and conference proceedings.

In 2008, electronic text-book was issued from three competition conferences of young experts.

Cooperates with other periodicals (Water Management Journal, Water Management Reporter, Meteorological Reports, Enviromagazine, Acta Hydrologica Slovaca, and Environment). Is represented in body of editors of national and international journals. Supports promotion of its activity, mainly by co-operation with elementary, secondary schools and with Universities. Maintains contacts with public and media and organises traditional Open Day.

In 2008, ***the Slovak Environmental Agency Banská Bystrica*** published 6 regular and 2 special editions of Enviromagazine, Report on condition of environment of the Slovak Republic and thematic documents concerning educational activities.

The Environmental Education Department prepared a publication for practical environmental education and continuously issued educational and information documents for the project NATURA 2000 – Methodical guidelines for pupils of elementary schools NATURA

2000, card games – plants, vertebrates, invertebrates and a publication Getting to know plant and animal species of European importance in Slovakia I., II., III.

13 CONCLUSION

The fundamental objectives of water management are aimed mainly at:

- providing drinking water supply using public water supply systems together with wastewater collection and treatment by public sewerage systems to fulfil the commitments towards the EU,
- providing water for other economic purposes,
- preventing and mitigating the consequences of floods and droughts,
- environmental protection.

The basis of new water policy in the SR was integrated water resources management and protection in hydrological river basins – the so called integrated river basin management. In accordance with requirements of the European Directive the first working version of the *Proposal of River Basin Management Plans of the Slovak Republic* was developed by the end of 2008.

A significant step in the process of river basin management plans was elaboration of the *Overview of Significant Water Management Issues*, which serves as a supporting document for further working phase of implementation of the WFD.

The development of public water supply is done within the Plan of Development of Public Water Supply and Water Sewerage Systems. By implementing the mentioned Plan by 2015 the number of inhabitants served by the public water supply will increase from 86.3 % to more than 90 %. To ensure the proposed development of public water-supply it is necessary to build water-supply from the existing water resources to consumer-sites, water networks in municipalities, accumulation areas for providing continuous drinking water supply and water resources. Funds necessary for implementation of these constructions are estimated at 53.728 billion SKK (1.7834 billion €).

The situation is less favourable for wastewater discharge and treatment. In 2008, 59.1 % of the total population was connected to the public sewage system. To reach the EU level by 2015, there is a need of an amount of about 52.942 billion SKK (1.7574 billion €).

In both cases, it is crucial to provide the funds. An amount of 0.6927 billion € (20.868 billion SKK) is envisaged for an operational objective 1.2 Collection and treatment of urban wastewater in terms of commitments of Slovakia to the EU in the Operational Programme for Environment.

A less favourable situation is in meeting the requirements of the WFD for systematic water monitoring, which currently has 1.5 year delay at some biological quality elements.

The financial security of flood protection remains still a problem. At the end of 2008, the Programme of Flood Protection in the SR by 2010 is lagging behind compared to the timetable by 12.341 billion SKK (0.4096 billion €).

Within the Operational Programme Environment for the years 2007 – 2013, 120 million € have been planned for flood protection, which is 3.615 billion SKK. In addition to the EU resources, the funds from the state budget and own resources provided by the administrator of watercourses are envisaged.

LIST OF ABBREVIATIONS

AEWIS	Autonomous Early Warning and Information System
BE	Branch Enterprise
DE RA	Department of Environment of Regional Authority
DE DA	Department of Environment of District Authority
EEC	Economic justified costs
ES	European Standards
EU	European Union
GDP	Gross Domestic Product
HEP	Hydro-ecological Plan
HYCO	Hydro-consult, s.e., Bratislava
LA	Local Authorities
MA SR	Ministry of Agriculture of the SR
ME SR	Ministry of Environment of the SR
MUSES	Local landscape system of ecological stability
ORNI	Office for Regulation in Network Industries
OTN	Sectoral Technical Standards
Q_a	Long term Average rate of flow
Q_{min}	Minimal monitored rate of flow
Q_{100}	Water volume reached or exceeded once in 100 years
Q_{365d}	Flow exceeded approximately during 365 days in a year
RIS	River Information Services
RUSES	Regional landscape system of ecological stability
SB	State Budget
SHMI	Slovak Hydrometeorological Institute
SEI	Slovak Environmental Inspection
STN	Slovak Technical Standard
SWME	State Water Management Enterprise, s.e. Banská Štiavnica
TC	Technical Committees
VAT	Value Added Tax
WFD	Water Framework Directive
WMC	Water Management Construction
WMP	Water Management Plan
WRI	Water Research Institute Bratislava
WC	Water Company
WP	Work Packages
WSW	Water and Sewage Works
WWTP	Waste Water Treatment Plant

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