

# COMMUNICATION

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**Environmental statistics**

## ZS40

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### Wastewater discharged

The Communication contains selected statistical data on wastewater discharged by public sewage system. The tables present 2009 data on wastewater by origin and wastewater by treatment methods.

Total quantity of wastewater in 2009 decreased by 3.3% compared to the referent period 2008, out of which in municipalities with public sewage system, wastewater decreased by 2.8% relative to 2008 and in municipalities without public sewage system, wastewater decreased by 9.6% compared to 2008.

In 2009, regarding the municipalities with public sewage system, discharged wastewater of households increased by 1.8% relative to 2008, industrial sector produced 15.4% less wastewater, while discharged wastewater of other users decreased by 4.6% relative to 2008.

In 2009, treated wastewater increased by 16.4% compared to 2008 and the most frequently applied method was secondary treatment that purified 8.7% more wastewater than in 2008.

Share of treated wastewater in total discharged wastewater in 2009 increased by 19.8% if compared to 2008.

The data refer to the Republic of Serbia and its subteritories. Starting from 1999, the Statistical Office of the Republic of Serbia does not have available certain data for AP Kosovo and Metohia, which are therefore not included in the data for the Republic of Serbia (total).

#### Wastewater by origin, 2009 <sup>1)</sup>

	Total quantity of wastewater	Wastewater from municipalities with public sewage system, thous. m <sup>3</sup>				Wastewater from municipalities without public sewage system <sup>3)</sup>	Number of households connected to sewage system network
		Total	From households	From industrial sector	Other users <sup>2)</sup>		
<b>Republic of Serbia</b>	<b>363 278</b>	<b>339 429</b>	<b>228 933</b>	<b>63 951</b>	<b>46 545</b>	<b>23 849</b>	<b>1 282 971</b>
Central Serbia	270 000	265 654	181 201	52 874	31 579	4 346	982 693
AP Vojvodina	93 278	73 775	47 732	11 077	14 966	19 503	298 278
AP Kosovo and Metohia	...	...	...	...	...	...	...

<sup>1)</sup> Preliminary data.

<sup>2)</sup> Other users include water from enterprises from the following divisions: agriculture, forestry, fishing, hospitals, schools, hotels, restaurants and other public utilities, other public water supply systems, as well as water for own consumption

<sup>3)</sup> Wastewater from municipalities without public sewage system is estimated as 90% of water quantities distributed to those municipalities.

### Wastewater by treatment methods, 2009 <sup>1)</sup>

	Treated wastewater quantity, thous. m <sup>3</sup>				Wastewater discharged from municipalities with public sewage system	Share of treated wastewater in total wastewater discharge by percentage
	Total	Primary treatment	Secondary treatment	Tertiary treatment		
<b>Total</b>	<b>56 037</b>	<b>5 151</b>	<b>38 801</b>	<b>12 085</b>	<b>339 429</b>	<b>16,5</b>
Central Serbia	34 521	4 381	29 448	692	265 654	13,0
AP Vojvodina	21 516	770	9 353	11 393	73 775	29,1
AP Kosovo and Metohia	...	...	...	...	...	...

<sup>1)</sup> Preliminary data.

### Wastewater in Serbia, 2007-2009<sup>4)</sup>

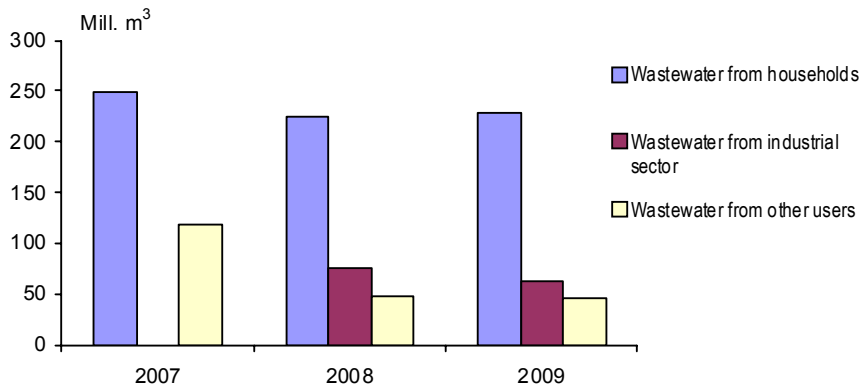
	2007	2008	2009
<b>REPUBLIC OF SERBIA</b>			
<b>Total urban wastewater, thous. m<sup>3</sup> <sup>1)</sup></b>	<b>380 300</b>	<b>375 552</b>	<b>363 278</b>
<b>Wastewater from municipalities with public sewage system</b>	<b>366 600</b>	<b>349 176</b>	<b>339 429</b>
From households	248 375	224 803	228 933
From industrial sector	-	75 599	63 951
From other users <sup>2)</sup>	118 225 <sup>4)</sup>	48 774	46 545
<b>Treated urban wastewater, thous. m<sup>3</sup></b>	<b>54 938</b>	<b>48 126</b>	<b>56 037</b>
Primary treatment	7 371	4 065	5 151
Secondary treatment	46 172	42 491	38 801
Tertiary treatment	1 395	1 570	12 085
<b>Sewage network</b>			
Total length of public sewage system network, km	13 267	13 779	13 832
Main collectors	2 102	2 239	2 107
Collecting networks	11 165	11 540	11 725
Number of connecting pipes	639 027	882 753	1 280 971
<b>Central Serbia</b>			
<b>Total urban wastewater, thous. m<sup>3</sup> <sup>1)</sup></b>	<b>295 808</b>	<b>280 342</b>	<b>270 000</b>
<b>Wastewater from municipalities with public sewage system</b>	<b>294 365</b>	<b>275 790</b>	<b>265 654</b>
From households	204 266	192 199	181 201
From industrial sector	-	50 051	52 874
From other users <sup>2)</sup>	90 099 <sup>4)</sup>	33 540	31 579
<b>Treated urban wastewater, thous. m<sup>3</sup></b>	<b>33 521</b>	<b>26 169</b>	<b>34 521</b>
Primary treatment	6 706	3 097	4 381
Secondary treatment	25 420	21 052	29 448
Tertiary treatment	1 395	1 570	692
<b>Sewage network</b>			
Total length of public sewage system network, km	9 890	10 076	10 123
Main collectors	1 623	1 180	1 648
Collecting networks	8 267	8 296	8 475
Number of connecting pipes	<b>483 581</b>	<b>597 909</b>	<b>982 693</b>
<b>AP Vojvodina</b>			
<b>Total urban wastewater, thous. m<sup>3</sup> <sup>1)</sup></b>	<b>84 492</b>	<b>95 210</b>	<b>93 278</b>
<b>Wastewater from municipalities with public sewage system</b>	<b>72 235</b>	<b>73 386</b>	<b>73 775</b>
From households	44 109	32 604	47 732
From industrial sector	-	25 548	11 077
From other users <sup>2)</sup>	28 126 <sup>4)</sup>	15 234	14 966
<b>Treated urban wastewater, thous. m<sup>3</sup></b>	<b>21 417</b>	<b>21 957</b>	<b>21 516</b>
Primary treatment	665	968	770
Secondary treatment	20 752	20 989	9 353
Tertiary treatment	-	-	11 393
<b>Sewage network</b>			
Total length of public sewage system network, km	3 377	3 703	3 709
Main collectors	479	3 244	459
Collecting networks	2 898	459	3 250
Number of connecting pipes	<b>155 446</b>	<b>284 844</b>	<b>298 278</b>
<b>AP Kosovo and Metohia</b>			
<b>Wastewater</b>	...	...	...
<b>Sewage network</b>	...	...	...

<sup>1)</sup> Total waste water from municipalities with and without public sewage system, atmospheric water excluded.

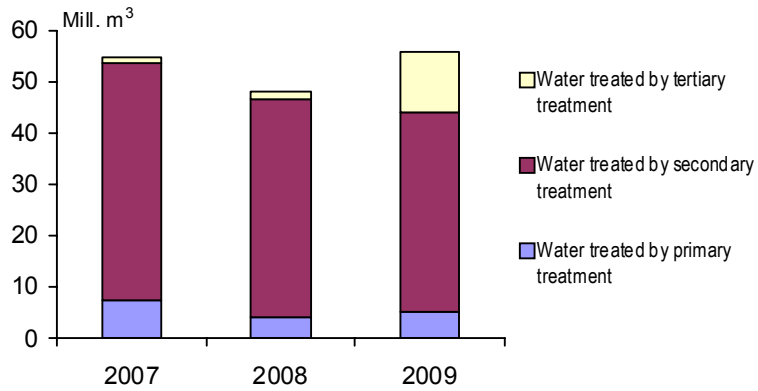
<sup>2)</sup> Wastewater from other users include water from enterprises from the following divisions: agriculture, forestry, fishing, hospitals, schools, hotels, institutions, trades and other public utilities, as well as water for own consumption.

<sup>4)</sup> Wastewater quantities in 2007 include water from industrial sector.

### Wastewater by origin, 2007-2009



### Treated wastewater by treatment method, 2007-2009



## Methodological explanations

Data on wastewaters and treated waters are collected from the reporting units that manage sewage systems. Activity of the reporting units is defined in division 41 of the Classification of Activities- abstraction, treatment and distribution and division 90- sewage and refuse disposal, sanitation and similar activities.

Data on public sewage system have been collected since 1953. The survey was conducted annually (1953-1965; 1974-1991), three-annually (1966-1974; 1992-2000) and from 2005, due to users' requests and significance of indicators based on these data, the survey has been conducted annually.

Regarding the geographical aspect, the survey encompasses enterprises that perform their activities on the whole territory of the Republic of Serbia.

Data are collected by the reporting method, meaning that the reporting unit completes the questionnaire based on its available documentation and records. In case the respective documentation and records are not available, experts provide estimations based on wastewater sewage system functioning, equipment and characteristics of the network and supporting facilities for wastewater treatment. The completed questionnaire is delivered by the reporting unit to the competent statistical authority on the territory of the enterprise's head office.

**Wastewater** is water which is, after use, treated as wastewater and transported to treatment plant or let out into recipient (underground or surface water). Wastewater quantities do not include atmospheric water. Quantities of wastewater are determined by water meter or are estimated according to regulations related to the particular activity group.

**Treatment of wastewater** means water purification from hazardous and harmful substances and radionuclides contained, thus making water innocuous for further use.

**Primary treatment** is treatment of wastewater by a physical and/or chemical process involving collecting of suspended solids, or other process in which the BOD<sub>5</sub><sup>5)</sup> of the incoming wastewater is reduced by at least 20% before discharge and the total suspended solids of the incoming wastewater are reduced by at least 50%.

**Secondary treatment** is treatment of wastewater by a process generally involving biological treatment with a secondary settlement or other processes, resulting in a BOD removal of at least 70% and a COD<sup>6)</sup> removal of at least 75%.

**Tertiary treatment** is continuation of secondary treatment of nitrogen and/or phosphorous and/or any other pollutant affecting the quality or a specific use of water: microbiological pollution, colour etc. The following minimum treatment efficiencies define tertiary treatment: organic pollution removal of at least 95% for BOD and 85% for COD, and at least one of the following- nitrogen removal of at least 70%, phosphorus removal of at least 80% and microbiological removal achieving a faecal coliform density less than 1000 in 100 ml.

**Public sewage system** (sewage system network) includes the network of channels and pipes that serves the drainage of wastewater and atmospheric water from settlements.

**Length of collectors' network** is the length of sewage system network of closed street channels, i.e. pipes for drainage of wastewater and atmospheric water from settlements, without connecting pipes and networks in the houses.

**Main collector** is the channel that transports wastewaters to treatment plants or water recipients.

**Connecting pipe** presents the place of object – street sewage system connection, i.e. connection of the objects through which wastewaters reach sewage network system.

<sup>5)</sup> BOD<sub>5</sub> – Biological Oxygen demand after five days

<sup>6)</sup> COD – Chemical Oxygen demand in KMnO<sub>4</sub>

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