Republic of Serbia Statistical Office of the Republic of Serbia

COMMUNICATION

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Environmental statistics

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, 2005							
	Total quantity of wastewater	Wastewater from municipalities with public sewage system, thous. m ³				Wastewater from	Number of households
		Total	From households	From industrial sector	Other users 2)	municipalities without public sewage system ³⁾	connected to sewage system network
Republic of Serbia	363 278	339 429	228 933	63 951	46 545	23 849	1 282 971
Central Serbia AP Vojvodina AP Kosovo and Metohia	270 000 93 278 	265 654 73 775 	181 201 47 732 	52 874 11 077 	31 579 14 966 	4 346 19 503 	982 693 298 278

Wastewater by origin, 2009¹⁾

¹⁾ Preliminary data.

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



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²⁾ 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

Wastewater by treatment methods, 2009¹⁾

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

¹⁾ Preliminary data.

Wastewater in Serbia, 2007-2009⁴⁾

Number of connecting pipes 483 581 597 909 982 693 Total urban wastewater, thous. m ^{3 1)} AP Vojvodina Wastewater from municipalities with public sewage system 72 235 73 386 73 775 From households - 25 548 11 077 From other users ²⁾ 28 126 ⁴⁾ 15 234 14 966 Treated urban wastewater, thous. m ³ 21 417 21 957 21 516 Primary treatment 665 968 770 Secondary treatment 20 752 20 989 9 353 Sewage network 3 377 3 703 3 709 Main collectors 479 3 244 459		51514, 2001 2000			
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Treated urban wastewater, thous. m³ 54 938 48 126 56 037 Primary treatment 7 371 4 065 5 151 Secondary treatment 1 395 1 570 12 085 Total length of public sewage system network, km 13 2 67 13 779 13 832 Main collectors 2 100 2 239 2 107 Collecting networks 11 165 11 540 1 1725 Number of connecting pipes 63 027 882 753 1 280 971 Collecting networks 295 808 280 342 270 000 Wastewater from municipalities with public sewage system - 50 051 52 874 From nidustrial sector - 50 051 52 874 From nidustrial sector - 50 051 52 874 Secondary treatment 25 420 21 052 29 448 Tertiary treatment 1 395 1 570 692 Sewage network 9 890 10 076 10 123 Main collectors 1 985 1 577 692 Sewage network 9 880 10 076 10 123	Wastewater from municipalities with public sewage system From households From industrial sector	366 600 248 375	349 176 224 803 75 599	339 429 228 933 63 951	
Primary treatment 7 371 4 065 5 151 Secondary treatment 1395 1570 12 085 Swage network 1395 1570 12 085 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 Collecting networks 11 165 15 440 11 725 Number of connecting pipes 639 027 882 753 1 280 971 Total urban wastewater, thous. m ³ 1 295 808 220 321 270 000 Wastewater from municipalities with public sewage system 50 051 52 874 From nother users ²¹ 90 099 ⁶¹ 33 521 26 169 34 521 Primary treatment 53 521 26 169 34 521 Secondary treatment 1395 1570 692 Sewage network 13 835 81 597 909 982 693 Main collectors	From other users ²⁾	118 225 ⁴⁾	48 774	46 545	
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 11 440 11 725 Number of connecting pipes 639 027 882 753 1 280 971 Total urban wastewater, thous. m ^{3 1} 295 808 280 342 270 000 Wastewater from municipalities with public sewage system 204 266 192 199 181 201 From obserbolds 204 266 192 199 181 201 From obserbolds 204 266 192 199 181 201 Primary treatment 6 706 3 097 4 381 Secondary treatment 25 420 21 052 29 448 Secondary treatment 1 395 1 570 692 Sewage network 9 890 10 076 10 123 Main collectors 8 267 8 296 8 475 Number of connecting pipes 8 267 8 296 8 475 Number of connecting pipes 8 2492 9 210 9 3 278 Wastewater from munici	Primary treatment Secondary treatment Tertiary treatment	7 371 46 172	4 065 42 491	5 151 38 801	
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Total urban wastewater, thous. m ³ ¹) 295 808 280 342 270 000 Wastewater from municipalities with public sewage system From nouseholds 204 266 192 199 181 201 From nouseholds - 50 051 52 874 From other users ²¹ 90 099 ⁴⁾ 33 540 31 579 Treated urban wastewater, thous. m ³ 3 521 26 649 34 521 Primary treatment 25 420 21 052 29 448 Tertiary treatment 25 420 21 052 29 448 Tettiary treatment 25 420 10 076 10 123 Sewage network 1 395 1570 692 Statia length of public sewage system network, km 9 890 10 076 10 123 Main collectors 8 267 8 296 8 475 Number of connecting pipes 483 581 597 909 982 693 Total urban wastewater, thous. m ³ 1) Wastewater from municipalities with public sewage system 72 35 73 386 73 775 From industrial sector - 25 48 11 077 From industrial sector -	Number of connecting pipes	639 027	882 753	1 280 971	
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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 483 581 597 909 982 693 AP Vojvodina Total urban wastewater, thous. m ^{3 1)} Wastewater from municipalities with public sewage system 84 492 95 210 93 278 From households 73 386 73 775 From industrial sector - 25 548 11 077 From other users ²¹ 28 126 ⁴¹ 15 234 14 966 Primary treatment 665 968 770 Secondary treatment 20 752 20 989 9 333 Tetal ength 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 155 446 284 844 298 278	Primary treatment Secondary treatment Tertiary treatment	6 706 25 420	3 097 21 052	4 381 29 448	
Total urban wastewater, thous. m ^{3 1)} 84 492 95 210 93 278 Wastewater from municipalities with public sewage system 72 235 73 386 73 775 From households - 25 548 11 077 From other users ²⁾ - 25 548 11 077 Zes 126 ⁴⁾ 15 234 14 966 Treated urban wastewater, thous. m ³ 21 417 21 957 21 516 Primary treatment 665 968 770 Secondary treatment - - 11 393 Sewage network - - 11 393 Total length of public sewage system network, km 3 377 3 703 3 709 Main collectors 2 898 459 3 250 Number of connecting pipes 2 898 459 3 250 Wastewater - - - - Wastewater - - - - Wastewater - - - - - Treated urban wastewater, thous. m ³ - - - - - - - - - <td< td=""><td>Total length of public sewage system network, km</td><td>1 623 8 267</td><td>1 180 8 296</td><td>1 648 8 475</td></td<>	Total length of public sewage system network, km	1 623 8 267	1 180 8 296	1 648 8 475	
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Primary treatment 665 968 770 Secondary treatment 20 752 20 989 9 353 Tertiary treatment - - 11 393 Sewage network - - 11 393 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 155 446 284 844 298 278 Mastewater	Wastewater from municipalities with public sewage system From households From industrial sector	72 235 44 109	73 386 32 604 25 548	73 775 47 732 11 077	
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 155 446 284 844 298 278 Mater Wastewater	Primary treatment Secondary treatment Tertiary treatment	665	968	770 9 353	
AP Kosovo and Metohia Wastewater	Total length of public sewage system network, km Main collectors Collecting networks	479 2 898	3 244 459	459 3 250	
Wastewater					
	Westewater				

¹⁾ Total waste water from municipalities with and without public sewage system, atmospheric water excluded. ²⁾ 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. ⁴⁾ 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 41of 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_5^{50} 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 COD⁶⁾ 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 then 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.

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 $^{^{5)}}$ BOD_5 – Biological Oxygen demand after five days $^{6)}$ COD – Chemical Oxygen demand in $KMnO_4$