



Belgrade, March 2022

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INTRODUCTION

Public Enterprise “Electric Power Industry of Serbia” 2021 Environmental Report was prepared on the basis of the recommendations regarding the contents and form – report template provided by the European Bank for Reconstruction and Development ([APPENDIX 1](#)), as well as on the basis of data on environment status monitoring submitted by the responsible persons of PE EPS Organizational units.

Hazardous and harmful substances air emission data have been provided on the basis of calculation based on measured mass concentrations, i.e. their flows and units’ (boilers) operating hours in 2021.

An overview of the legislation of the Republic of Serbia related to environmental protection on the basis of which the evaluation and comparison of measured values of pollutants and other parameters with the permissible values were performed, is provided in [APPENDIX 2](#).

Abbreviations used in the Report are provided in [APPENDIX 3](#).

I PUBLIC ENTERPRISE “ELECTRIC POWER INDUSTRY OF SERBIA“

Public Enterprise "Electric Power Industry of Serbia" Belgrade is a vertically organized enterprise, 100% state-owned. The founder of PE EPS is the Republic of Serbia and the founder's rights are exercised by the Government of the Republic of Serbia. The bodies of the Public Enterprise "Electric Power Industry of Serbia" are the Supervisory Board and the Director.

The main activity of the Public Enterprise "Electric Power Industry of Serbia" is energy activity: electricity supply, activity code 35.14 - electricity trade.

The mission of "Electric Power Industry of Serbia" is secure supply of the customers with electricity, under the market conditions, with continuous production, improvement of service quality and customers satisfaction, promoting environmental awareness and improving the general well-being of the community.

The vision of "Electric Power Industry of Serbia" is to be a socially responsible, market-oriented and profitable company, competitive in the regional market and harmonized with the highest standards of business operation and sustainable development, recognized as a reliable partner to national and international companies.

Public Enterprise "EPS Trgovanje" Ltd. Ljubljana was founded on July 1st, 2014 as the first public enterprise (PE) that PE EPS founded abroad for electricity trading.

PE EPS has founder's rights in three public companies in Kosovo and Metohija. Since June 1999, PE EPS has been unable to manage its capacities in Kosovo.

Coal Production in PE EPS

In PE EPS, coal is produced by the following Organizational units of PE EPS: Branch MB “Kolubara”, “Kostolac” TPPs-OCMs Branch and PE “Kosovo” OCMs**. The amounts of produced raw and dried coal (except for Kosovo OCMs**) in 2021 are given in Table 1.

Table 1

PUBLIC ENTERPRISE “ELECTRIC POWER INDUSTRY OF SERBIA”						
COAL PRODUCTION IN 2021						
Organizational unit	Coal production (t)			Overburden removal (m ³ čm)		
	Planned	Achieved	%	Planned	Achieved	%
BRANCH MB “KOLUBARA” – OPEN CAST MINES						
Field B	6.470.000	5.828.886	90,09	15.600.000	14.317.275	91,78
Field D	2.615.000	519.333	19,86	-	-	-
Field G	4.550.000	5.245.427	115,28	5.500.000	6.120.753	111,29
Tamnava – West Field	12.305.000	11.920.334	96,87	30.300.000	27.907.204	92,10
Radljevo	-	-	-	5.000.000	3.328.124	66,56
Field E	3.160.000	3.026.333	95,77	19.960.000	8.999.747	45,09
TOTAL (RAW COAL*): BRANCH MB “KOLUBARA” – OPEN CAST MINES	29.100.000	26.540.313	91,20	76.360.000	60.673.103	79,46
Kolubara Processing Plant (dried coal)	With dust	575.000	302.992	52,69		
	Without dust	525.000	291.205	55,48		
TPPs-OCMs “KOSTOLAC” – OPEN CAST MINES						
Drmno	9.350.000	9.393.439	100,46	46.500.000	45.701.592	98,28
TOTAL: “KOSTOLAC” TPPS-OCMS BRANCH – OPEN CAST MINES	9.350.000	9.393.439	100,46	46.500.000	45.701.592	98,28
TOTAL: OPEN CAST MINES PE EPS	38.450.000	35.933.752	93,46	122.860.000	106.374.695	86,58

* Total raw coal amount, partially used for dried coal production

** As of June 1999, PE EPS does not operate its Kosovo and Metohija capacities

Electricity Generation in PE EPS

In PE EPS, electricity is generated by the following thermal power plants: “Nikola Tesla” TPPs, “Kostolac” TPPs-OCMs, “Panonske” CHP, PE “Kosovo” TPPs*, and by the following hydropower plants: “Đerdap” HPP and “Drinsko – Limske” HPPs. Electricity generation data (except for PE “Kosovo” TPPs*) in 2021 are given in Table 2.

Table 2

PUBLIC ENTERPRISE “ELECTRIC POWER INDUSTRY OF SERBIA”			
ELECTRICITY GENERATION IN 2021			
Branch	Unit	Electricity generation (GWh)	
		at the generator	sent to grid
NIKOLA TESLA TPPs			
NIKOLA TESLA A TPP	A1 - A2	1.920,26	1.716,41
	A3 - A5	5.873,05	5.298,22
	A6	1.958,18	1.740,41
NIKOLA TESLA B TPP	B1 - B2	5.965,41	5.563,14
KOLUBARA A TPP	A1 - A4	261,00	250,59
	A5	478,02	430,67
MORAVA TPP	A	342,74	311,11
TOTAL: NIKOLA TESLA TPPs		16.798,66	15.310,55
“KOSTOLAC” TPPs-OCMs			
“KOSTOLAC” A TPP	A1	663,14	586,06
	A2	1.438,21	1.320,69
“KOSTOLAC” B TPP	B1	2.405,46	2.143,58
	B2	2.428,08	2.176,58
TOTAL: “KOSTOLAC” TPPs-OCMs		6.934,89	6.226,91
“PANONSKE” PPs			
NOVI SAD CHPP		687,82	630,08
ZRENJANIN CHPP		0,00	0,00
SREMSKA MITROVICA CHPP		0,00	0,00
TOTAL: “PANONSKE” POWER PLANTS		687,82	630,08
TOTAL: TPPs and CHPs		24.421,37	22.167,54
HYDROPOWER PLANTS			
“ĐERDAP” HPPs		7.610,69	7.574,01
“DRINSKO-LIMSKE” HPPs		4.096,89	4.076,62
SMALL HPPs		15,20	15,20
TOTAL: HYDRO POWER PLANTS		11.722,78	11.665,83
PE “ELEKTROKOSMET”**		/	/
TOTAL: PE EPS (exclusive of K&M)		36.144,15	33.833,37

* As of June 1999, PE EPS does not operate its Kosovo and Metohija capacities

Fuel Consumption in PE EPS Thermal Power Plants

Table 3 shows the solid, liquid and gaseous fuel consumption data by PE EPS TPPs and CHPs in 2021.

Table 3

PUBLIC ENTERPRISE "ELECTRIC POWER INDUSTRY OF SERBIA"						
FUEL CONSUMPTION IN 2021						
Organizational unit	Unit /boiler	Fuel				
		Coal	Heavy fuel oil	Oil	Gas	Biomass
		t	t	t	Stm ³	t
BRANCH "NIKOLA TESLA" TPPs						
"NIKOLA TESLA" A TPP	A1	1.389.706	16.743	-	-	-
	A2	1.711.635	12.816	-	-	-
	A3	3.132.910	6.264	-	-	-
	A4	3.445.379	4.214	-	-	-
	A5	2.958.248	4.694	-	-	-
	A6	3.142.262	4.823	-	-	-
"NIKOLA TESLA" B TPP	B1	2.858.473	9.302	-	-	-
	B2	6.616.097	21.776	-	-	-
"KOLUBARA" A TPP	K1	247.776	-	1.200	-	-
	K2	-	-	-	-	-
	K3	21.909	-	285	-	-
	K4	120.063	-	719	-	-
	K5	148.723	-	789	-	-
	K6	867.934	-	2.607	-	-
"MORAVA" TPP	A1	435.659	1.012	882	-	-
TOTAL: BRANCH "NIKOLA TESLA" TPPs		27.096.774	81.644	6.482	-	-
BRANCH "KOSTOLAC" TPPs-OCMs						
"KOSTOLAC" A TPP	A1	949.531	-	2.206	-	-
	A2	1.841.174	-	1.854	-	-
"KOSTOLAC" B TPP	B1	2.749.342	2.342	-	-	-
	B2	2.786.877	2.529	-	-	-
TOTAL: BRANCH "KOSTOLAC" TPPs-OCMS		8.326.924	4.871	4.060	-	-
BRANCH MB KOLUBARA – ORGANIZATIONAL UNIT "PROCESSING PLANT"						
VREOCI HEATING PLANT	K1 and K2	239.267	476,50	-	-	-
TOTAL: BRANCH MB KOLUBARA		239.267	476,50	-	-	-
BRANCH "PANONSKA" CHPs						
"NOVI SAD" CHP	A1 (K1 and K2)	-	-	-	-	-
	A2 (K3)	-	-	-	-	-
	Stack, both units – continuous measurements	-	-	-	228.896,477	-
"ZRENJANIN" CHP	A1	-	-	-	-	-
	A2	-	-	-	200,638	-
"SREMSKA MITROVICA" CHP	A3 (K3 and K4)	-	-	-	-	-
	S2400 1-3	-	-	-	1.015,010	-
	Biomass boiler	-	-	-	92,605	5.833
TOTAL: BRANCH "PANONSKA" CHPS		-	-	-	230.204,730	5.833
TOTAL: PUBLIC ENTERPRISE "ELECTRIC POWER INDUSTRY OF SERBIA"		35.662.965	86.991,50	10.542	230.204,730	5.833

Emission of Substances from Thermal Power Plants Affecting the Air Quality

Data on complete emission of substances from thermal power plants affecting the air quality in 2021 for PE EPS organizational units (except for PE Kosovo TPPs*) are given in Table 4.

Table 4

PUBLIC ENTERPRISE "ELECTRIC POWER INDUSTRY OF SERBIA"				
AMOUNTS OF EMISSIONS OF SUBSTANCES FROM THERMAL POWER PLANTS AFFECTING THE AIR QUALITY IN 2021				
Organizational unit	t / year			
	Particulate matter	SO ₂	NO _x (NO ₂)	CO ₂
"NIKOLA TESLA" TPPs BRANCH	6.155,84	198.496,79	25.207,56	18.783.024,00
"KOSTOLAC" TPPs-OCMs BRANCH	1.242,06	80.767,75	9.310,56	6.355.777,93
"PANONSKE" CHP BRANCH	4,02	3,87	1.209,18	428.017,03
BRANCH MB KOLUBARA - ORGANIZATIONAL UNIT "PROCESSING PLANT"	72,79	1.185,30	172,03	289.347,80
TOTAL: PUBLIC ENTERPRISE "ELECTRIC POWER INDUSTRY OF SERBIA"	7.474,71	280.453,71	35.899,33	25.856.166,76

Work Injuries in PE EPS

Table 5 shows data on the number of work injuries in 2021 for PE EPS Organizational units.

Table 5

PUBLIC ENTERPRISE "ELECTRIC POWER INDUSTRY OF SERBIA"						
WORK INJURIES IN 2021						
Organizational unit	Number of employees	Injuries - number of employees ratio				
		Minor	Severe	Fatal	Total	%
"KOLUBARA" MB BRANCH	11.446	150	52	0	202	1,76
"KOSTOLAC" TPPs-OCMs BRANCH – OPEN CAST MINES	2.076	6	2	0	8	0,39
OPEN CAST MINES:	13.522	156	54	0	210	1,55
"NIKOLA TESLA" TPPs BRANCH	2.274	26	3	0	29	1,28
"KOSTOLAC" TPPs-OCMs BRANCH – THERMAL POWER PLANTS	746	0	1	0	1	0,13
"PANONSKE" CHPs BRANCH	370	8	0	0	8	2,16
THERMAL POWER PLANTS:	3.390	34	4	0	38	1,12
"ĐERDAP" HPPs BRANCH	760	1	1	0	2	0,26
"DRINSKO-LIMSKE" HPPs BRANCH	432	5	2	0	7	1,62
"RENEWABLE ENERGY RESOURCES" BRANCH	57	0	1	0	1	1,75
HYDRO POWER PLANTS:	1.249	6	4	0	10	0,80
PE EPS HQ	934	4	0	0	4	0,43
BRANCH "EPS SUPPLY"	1.141	1	5	0	6	0,53
TOTAL: PUBLIC ENTERPRISE "ELECTRIC POWER INDUSTRY OF SERBIA"	20.236	201	67	0	268	1,32

Note: Relevant data on fatalities are given in the Section relating to the relevant PE EPS Organizational unit.

PE EPS Employees' Health Protection

Table 6 presents data on employee's health protection, which includes obligatory medical examination prior to employment, as well as periodical examinations with the aim of determining employees' work ability, conducted during 2021 in PE EPS Organizational units.

Table 6

PUBLIC ENTERPRISE "ELECTRIC POWER INDUSTRY OF SERBIA"											
EMPLOYEES' WORK ABILITY IN 2021											
Organizational unit	Number of employees	Periodic examinations				For work					
		Referred to examination		Examined		Able		Limited ability		Disabled	
		no.	%	no.	%	no.	%	no.	%	no.	%
BRANCH MB "KOLUBARA"	11.446	10.214	89,24	9.333	91,37	6.608	70,80	2.525	27,05	200	2,14
"KOSTOLAC" TPPs-OCMs BRANCH - OCM	2.076	1.358	65,41	1.335	98,31	1.188	88,99	131	9,81	16	1,20
OPEN CAST MINES:	13.522	11.572	85,58	10.668	92,19	7.796	73,08	2.656	24,90	216	2,02
"NIKOLA TESLA" TPPs BRANCH	2.274	1.833	80,61	1.818	99,18	1.639	90,15	163	8,97	16	0,88
"KOSTOLAC" TPPs-OCMs BRANCH	746	563	75,47	554	98,40	517	93,32	36	6,50	1	0,18
"PANONSKA" CHPs BRANCH	370	272	73,51	270	99,26	134	49,63	136	50,37	0	0,00
THERMAL POWER PLANTS:	3.390	2.668	78,70	2.642	99,03	2.290	86,68	335	12,68	17	0,64
"ĐERDAP" HPPs BRANCH	760	0	0,00	0	0,00	0	0,00	0	0,00	0	0,00
"DRINSKO-LIMSKE" HPPs BRANCH	432	127	29,40	126	99,21	93	73,81	32	25,40	1	0,79
"RENEWABLE ENERGY RESOURCES" BRANCH	57	37	64,91	37	100,00	37	100,00	0	0,00	0	0,00
HYDRO POWER PLANTS:	1.249	164	13,13	163	99,39	130	79,75	32	19,63	1	0,61
PE EPS HQ	934	0	0,00	0	0,00	0	0,00	0	0,00	0	0,00
BRANCH "EPS SUPPLY"	1.141	0	0,00	0	0,00	0	0,00	0	0,00	0	0,00
TOTAL: PUBLIC ENTERPRISE "ELECTRIC POWER INDUSTRY OF SERBIA"	20.236	14.404	71,18	13.473	93,54	10.216	75,83	3.023	22,44	234	1,74

1. BRANCH MINING BASIN “KOLUBARA”

The core activities of Branch MB “Kolubara” comprise mining, processing and transportation of coal. Organizationally, it is comprised of the Head Office and four organizational units:

1. Open Cast Mines
2. Processing Plant
3. Projekt and
4. Metal

The following open cast mines are active in the Organizational unit “Open Cast Mines – Baroševac”:

1. “Field B/C”
2. “Field D”
3. “Tamnava West Field“
4. “Field G” and
5. “Field E”

The Sector for Environmental Protection and Improvement deals with environmental tasks and its role is to prevent, control, mitigate and remediate all forms of environmental pollution. This Sector comprises the following four Divisions:

1. Enviromental Protection and Enhancement Division – the organizational unit “Open Cast Mines – Baroševac”;
2. Biological Reclamation Division;
3. Waste and Hazardous Substances Division; and
4. Enviromental Protection and Enhancement Division – the organizational unit “Processing Plant”- Vreoci.

A. BRANCH MB KOLUBARA – OU“OPEN CAST MINES”

1.1. Overview and Status of Permits

The overview and status of permits, licenses and other necessary approvals realized in 2021 are shown in Table 7.

Table 7

BRANCH MB KOLUBARA – OU “OPEN CAST MINES”			
Overview and status of permits in 2021			
Open cast mine	Permits, licenses and other necessary approvals obtained in 2021 Project name and status	Applications for new or extension of existing permits	Note
Field B/C	The approval on performing mining works according to the Supplementary Mining Design of Field C on the exploitation field 321 of the cadastre of exploitation fields, on the territory of the city municipality of Lazarevac No. 310-02-01085/2015-02 dated 28.11.2018 Decision on the use and utilization of the IV ECS system on the OCM Field C No. 310-02-00002/2019 - 02 dated 6.03.2020 The approval on performing mining works according to the Supplementary Mining Design of the Open Cast Mine Field C No. 310-02-01517/2021-02 dated 30.11.2021	-	-
Field D	-	-	-
Field E	Decision on approving the performance of mining works according to the Main Mining Design of the Open Cast Mine Field E No. 310-02-01494/2021-02 dated 24.12.2021	-	

BRANCH MB KOLUBARA – OU “OPEN CAST MINES”			
Overview and status of permits in 2021			
Open cast mine	Permits, licenses and other necessary approvals obtained in 2021 Project name and status	Applications for new or extension of existing permits	Note
Veliki Crljeni	-	Request for the withdrawal of the Request for obtaining approval for the performance of mining works No. 04.02-219377/1-17 dated 04.05.2017 according to the Supplementary Mining Design for the Expansion of the Open Cast Mine Veliki Crljeni, No. 04.02-553855/1-20 dated 10.11.2020	-
Tamnava West Field	Approval for the trial run of the mobile bench drive head station with the belt B=1600 mm No. 310-02-01974/2020-02 dated 23.12.2020 Decision on approval for the use and utilization of the spreader 12000 PA 200/2200-15+55+60 with tripper car constructed according to the Supplementary Mining Design Tamnava West Field approved by the Decision No. 310-02-00587/2014-03 dated 25.08.2014, received on 26.10.2021 No. 310-02-01924/2020-02.	Request for obtaining approval for the performance of mining works under the Supplementary Mining Design of the Open Cast Mine Tamnava West Field dated 03.06.2020; Supplement to the documentation for obtaining approval for the performance of mining works under the Supplementary Mining Design of the Open Cast Mine Tamnava West Field dated 21.01.2021	-
Field G	Decision on trial run of the mobile shifting station MRS 1800 on the OCM Field G No. 310-02-00031/2021-02 dated 01.03.2021 Approval for the trial run of the mobile bench drive head station with the belt B=1600 mm (internal marking E-3) on the Open Cast Mine Field G No. 310-02-01246/2021-02 dated 14.06.2021 Approval for the trial run of the mobile bench drive head station with the belt B=1600 mm (internal marking E-2), on the open cast mine Field G No. 310-02-00793/2021-02 dated 27.10.2021	-	-
Radljevo – North	Decision on approval for the project holder PE EPS of the Study on Environmental Impact Assessment of the project of opening and construction of the Open Cast Mine Radljevo No. 353-02-1483/2012-02 dated 12.12.2012 Decision on approval of the use and utilization of the mining facilities of I ECS system at the OCM Radljevo – North No. 310-02-01600/2019-02 dated 17.08.2020	-	-

1.2. Monitoring and Environmental Impacts

1.2.1. Air Quality Measurements

During 2021, the air quality was measured only with own capacities, i.e. using automatic analyzers PM₁₀, PM_{2.5}, SO₂, NO/ NO₂/ NO_x, CO and O₃, and in accordance with the annual sampling plan. During the heating season, large exceedances of suspended particles were found at almost all measuring points. Certain exceedances were linked to coal self-ignitions in open cast mines, of which the responsible persons were informed. According to the inspector's order, a 10-day measurement of PM_{2.5} and UTM was performed in June 2021, but there were no exceedances.

1.2.2. Emission Measurements of Matters Affecting Water Quality

▪ Dewatering System Water

Water originating from the preliminary dewatering and dewatering systems represents a technological part of the coal exploitation system. Waters pumped (mining wastewaters) from these systems are discharged without treatment over a sedimentation tank into the surrounding recipients, as follows:

- OCM "Field B/C", Baroševac into the river Peštan and into the river Turija;
- OCM "Field D", Medoševac into the river Peštan;
- OCM "Tamnava West Field" into the river Kolubara, and
- OCM "Field G" into the river Kolubara.

In accordance with the law, the quality control of the recipients is carried out by the authorized laboratory.

Table 8 shows the pumped water quality results from the open cast mines (from the sedimentation tank into the recipient) in 2021.

Table 8

BRANCH MB KOLUBARA – OU "OPEN CAST MINES"				
Water quality in 2021				
Parameters	OCM "Field G"	OCM Field "B/C", Baroševac	OCM "Field D" Medoševac	OCM "Tamnava West Field"
Electrical conductivity (µs/cm)	461 - 555	451 - 587	720 - 764	461 – 5589
pH	7.4 - 7.8	7.3 - 7.6	7.3 – 7.7	7.1 - 7.7

▪ Sanitary waters

Open cast mines are supplied with drinking water from regional water supply systems: Medoševac, Kalenić, Junkovac, and Tamnava - East Field. Table 9 shows the data on the quantities of wastewater generated from the drainage of mines and quantities of drinking water used in 2021. The amount of generated sanitary wastewaters can be estimated on the basis of the quantity of the supplied drinking water.

Table 9

BRANCH MB KOLUBARA – OU "OPEN CAST MINES"		
Water quantity in 2021 (m ³ /year)		
Open cast mine	Total amounts of pumped water (m ³)	Supplied drinking water (m ³)
Field B/C + mines HQ	938.023,00	96.225,00
Field D	4.662.321,04	133.725,00
Field G	2.864.387,00	192.050,00
Tamnava West Field	9.679.034,00	88.125,00
Radljevo	248.584,00	7.500,00
Auxiliary machinery	-	94.200,00

1.2.3. Emission Measurements of Matters Affecting Soil Quality

During 2021, the quality of land was measured at 21 locations. After spatial analysis and comparison with measurements from previous years, the stated exceedances of certain heavy metals were concluded to originate from the natural background.

▪ Overview of Expropriated and Reclaimed Areas

The maintenance of reclaimed areas is envisaged by the Branch Business Plan, together with temporary reclamation measures on new areas. Final reclamation measures are carried out after the completion of mining operations, based on the adopted Kolubara Region Spatial Plan.

Within Biological Reclamation Division, Forestry Office manages 611.30 ha of reclaimed areas (forests and forestry land). Within the Management Basis, within Field "D", there are 49.28 ha of expropriated forests and forestry land.

Within Biological Reclamation Division, Agriculture Office conducts the biological reclamation measures on 93.84 ha of reclaimed area. In 2021, infrastructural and mining works were conducted on the reclaimed areas of 13.56 ha, so this area was not cultivated. Moreover, regular agricultural production is conducted on the expropriated lots of 13.60 ha (0.9 ha of expropriated areas is leased to third parties).

The overview of expropriated and reclaimed areas prior to 2021 is shown in Table 10.

Table 10

BRANCH MB KOLUBARA – BRANCH “OPEN CAST MINES“ BAROŠEVAC																			
Review of reclaimed areas prior to 2021																			
Open cast mine /Facility	Expropriated areas (ha)	Land area registered in the cadastre (ha)		Land area whose use has been changed (ha)		Land containing buildings (ha)		Dump site areas (ha)				Reclaimed areas (ha)							
		until 2020	in 2021	until 2020	in 2021	until 2020	in 2021	Inside		Outside		Forests		Arable land		Orchards		Nurseries	
								until 2020	in 2021	until 2020	in 2021	until 2020	in 2021	until 2020	in 2021	until 2020	in 2021	until 2020	in 2021
Field D	2.340,40	2.318,42	10,18	802,97	7,58	20,27	-1,62	1.240,17	-9,60	0,00	0,00	430,44	0,00	51,00	0,00	7,00	0,00	0,00	0,00
Field B	1.176,35	1.172,93	-1,57	521,00	5,36	19,31	-0,47	461,64	-0,20	0,00	0,00	111,65	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Auxiliary machinery	3,98	3,98	0,00	0,54	0,00	3,98	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Mines HQ	4,53	17,96	-13,57	1,29	-0,62	17,65	-13,58	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
South Field	460,00	422,03	28,47	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Field G	406,88	266,49	-38,72	0,09	-0,09	0,00	0,00	65,33	63,40	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Field E	723,27	676,18	34,19	7,07	0,00	13,18	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Tamnava East Field	2.001,22	1.944,64	0,30	82,67	0,00	94,04	0,00	507,95	-24,88	0,00	0,00	60,63	0,00	49,40	0,00	0,00	0,00	0,00	0,00
Veliki Crijeni Field	153,79	161,03	1,01	0,00	0,00	23,21	0,00	19,82	-2,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Tamnava West Field	1.898,56	1.840,96	20,20	70,13	0,00	48,37	-1,92	877,10	40,99	0,00	0,00	8,58	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Radljevo	449,09	376,78	-346,06	4,90	-2,77	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
TOTAL:	9.618,07	8.907,14		1.497,99		222,42		3.239,72		0,00		611,30		100,40		7,00		0,00	

1.2.4. Environmental Noise Measurement

During 2021, the measurement of noise in the environment was performed with our own capacities. No exceedances were found.

1.2.5. Waste

In 2021, Waste and Hazardous Substances Division activities involved the establishment of waste management systems, the procurement of environmental protection equipment for waste management, signing of contracts with the operators licensed for sale – disposal of waste, reporting to the competent authorities, preparation of tender documentation and waste sale contracts implementation.

The waste generated within the Branch “Open Cast Mines Baroševac” in 2021 is shown in Table 11, according to the legislation of the Republic of Serbia in the field of waste management.

Table 11

BRANCH MB KOLUBARA – BRANCH “OPEN CAST MINES“											
Types of waste generated in 2021											
No.	Rulebook on Categories, Testing and Classification of Waste ("Official Gazette of RS", No. 56/2010, 93/2019 and 39/2021)		Measurin g unit	Open Cast Mine/Facility						Total:	Note
				"Field D"	"Field B"	"Tamnava West Field"	"Tamnava East Field"	Auxiliary Machi.	Generated waste quantities		
	Name	Index number									
1.	Waste printing toner other than those mentioned in 08 03 17	08 03 18	t	0,008	0,000	0,032	0,010	0,000	0,050	Waste printing toners	
2.	Ferrous metal filings and turnings	12 01 01	t	20,000	10,680	0,000	0,000	0,000	30,680	Iron and steel scrap, metal chip, clean waste ferrous metals chip, waste ferrous metals chip with impurities	
3.	Non-ferrous metal filings and turnings	12 01 03	t	0,350	0,000	0,000	0,000	0,000	0,350	Bronze, brass scrap	
4.	Spent waxes and fats	12 01 12*	t	0,000	0,000	0,000	0,790	0,000	0,790	Waste fat	
5.	Mineral-based non-chlorinated hydraulic oils	13 01 13* 13 01 10*	t	1,300	0,000	1,592	0,000	0,000	2,892	Hydraulic oils	
6.	Mineral-based non-chlorinated engine, gear and lubricating oils	13 02 05*	t	0,800	3,000	4,500	2,290	139,613	150,203	Engine oil, gear oils	
7.	Other insulating and heat transmission oils	13 03 10*	t	0,400	0,500	0,000	0,000	0,000	0,900	Transformer oils	
8.	Oily water from oil/water separators	13 05 07*	t	0,000	0,000	0,000	0,000	65,180	65,180	Separator residue, liquid waste from the oil pit (emulsion)	
9.	Other emulsions	13 08 02*	t	2,740	8,620	9,460	0,000	14,200	35,020	Waste emulsions, mechanical emulsions and solutions without halogenated matters, waste sludge from cleaning facilities	
10.	Wastes not otherwise specified	13 08 99*	t	0,000	0,000	2,000	0,000	0,000	2,000	Fats and oils with impurities	
11.	Packaging containing residues of or contaminated by hazardous substances	15 01 10*	t	0,000	0,350	0,300	0,000	14,620	15,270	Waste metal barrels of oil and lubricants, waste barrels of grease and oil, metal packaging of paints, varnishes and thinners	

BRANCH MB KOLUBARA – BRANCH “OPEN CAST MINES“										
Types of waste generated in 2021										
No.	Rulebook on Categories, Testing and Classification of Waste ("Official Gazette of RS", No. 56/2010, 93/2019 and 39/2021)		Measuring unit	Open Cast Mine/Facility						Note
				"Field D"	"Field B"	"Tamnava West Field"	"Tamnava East Field"	Auxiliary Machi.	Total:	
	Name	Index number		Generated waste quantities						
12.	Absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated by hazardous substances	15 02 02*	t	0,400	0,000	1,502	0,500	0,345	2,747	Oil and air filters, oiled glass wool, work suits, cloths, work suits
13.	Absorbents, filter materials, wiping cloths and protective clothing other than those mentioned in 15 02 02	15 02 03	t	0,500	0,630	0,000	0,000	5,217	6,347	PP equipment, workwear, personal protective equipment, air filters
14.	End-of-life tyres	16 01 03 19 12 12	t	0,000	0,000	0,000	0,000	65,790	65,790	Pneumatics
				100,000	8,820	0,000	0,000	0,000	108,820	Steel cord conveyor belt, sealing rubber, scrapers, idler rings
15.	End-of-life vehicles, containing neither liquids nor other hazardous components	16 01 06	t	0,000	0,000	0,000	0,000	200,000	200,000	Discarded vehicles without liquids and hazardous substances
16.	Oil filters	16 01 07*	t	0,000	0,000	0,000	0,000	4,517	4,517	Waste oil filters
17.	Brake pads containing asbestos	16 01 11*	t	0,500	0,000	0,000	0,000	0,300	0,800	Waste from asbestos braids and brake linings
18.	Hazardous components other than those mentioned in 16 01 07 to 16 01 11 and 16 01 13 and 16 01 14	16 01 21*	t	0,000	0,000	0,000	0,000	0,500	0,500	Greased hydraulic hoses
19.	Wastes not otherwise specified	16 01 99 17 04 05	t	0,000	0,000	0,000	0,000	2.045,000	2.045,000	Waste construction machinery and parts thereof
20.	Discarded equipment containing hazardous components other than those mentioned in 16 02 09 to 16 02 12	16 02 13*	t	0,000	3,900	0,000	0,000	0,000	3,900	Power rectifiers containing mercury
21.	Lead batteries	16 06 01*	t	0,000	0,360	1,900	0,000	14,883	17,143	Lead-acid batteries
22.	Laboratory chemicals consisting of or containing hazardous substances, including mixtures of laboratory chemicals	16 05 06*	t	0,000	0,000	0,003	0,000	0,000	0,003	Lab. chemicals

BRANCH MB KOLUBARA – BRANCH “OPEN CAST MINES“										
Types of waste generated in 2021										
No.	Rulebook on Categories, Testing and Classification of Waste ("Official Gazette of RS", No. 56/2010, 93/2019 and 39/2021)		Measurin g unit	Open Cast Mine/Facility						Note
				"Field D"	"Field B"	"Tamnava West Field"	"Tamnava East Field"	Auxiliary Machi.	Total:	
	Name	Index number		Generated waste quantities						
23.	Copper, bronze, brass	17 04 01	t	0,320	0,882	0,000	0,000	0,000	1,202	Copper, copper strips, copper lacquer wire, insulated copper coils, scrap tin bronze, scrap aluminium bronze
24.	Aluminium	17 04 02	t	0,000	0,780	0,000	0,000	0,000	0,780	Waste aluminum sheet, couplings
25.	Iron and steel	17 04 05	t	41,000	70,160	9,190	3,000	0,000	123,350	Alloy steel (platform segments, crusher hammers, excavator teeth)
				4,000	6,480	0,000	0,000	0,000	10,480	Iron and steel with rubber coating, padded idlers
				10,000	253,660	0,000	0,000	0,000	263,660	Iron over 6 mm (rails, parts of structures, idlers and shafts)
				13,000	150,047	0,000	34,000	0,000	197,047	Iron and steel over 3 mm (sheets, electrical switching cabinets. vulcanization container, sheet metal profiles, mixed category cabinets)
				154,500	105,200	1.014,165	1,700	0,000	1.275,565	Iron and steel over 3 mm (sheets, idlers, shafts, structures, steel ropes, pieces of various sizes and shapes, unclassified, steel ropes, sheets, steel bodies, structures, crates, pontoons, rails)

BRANCH MB KOLUBARA – BRANCH “OPEN CAST MINES“										
Types of waste generated in 2021										
No.	Rulebook on Categories, Testing and Classification of Waste ("Official Gazette of RS", No. 56/2010, 93/2019 and 39/2021)		Measuring unit	Open Cast Mine/Facility						Note
				"Field D"	"Field B"	"Tamnava West Field"	"Tamnava East Field"	Auxiliary Machi.	Total:	
	Name	Index number		Generated waste quantities						
26.	Cables other than those specified under 17 04 10	17 04 11	t	7,320	39,360	45,000	0,800	0,000	92,480	High voltage copper cables incl. insulation
				2,680	0,000	0,000	0,000	0,000	2,680	Low voltage copper cables incl. insulation
				0,000	0,000	1,000	0,000	0,000	1,000	Telephone cable
27.	Insulation materials containing asbestos	17 06 01*	t	0,420	0,000	0,000	0,000	0,000	0,420	Building insulation boards containing asbestos, hardboard
28.	Plastics and rubber	19 12 04	t	0,000	0,000	19,220	0,000	0,000	19,220	Wipers, sealing rubber, rubber rings conveyor belt with canvas
29.	Pesticides	20 01 19*	t	0,100	0,000	0,000	0,000	0,000	0,100	Waste pesticides and insecticides
30	Discarded electrical and electronic equipment other than those indicated under 20 01 21 and 20 01 23 containing hazardous components	20 01 35*	t	0,000	0,297	0,000	0,500	0,000	0,797	Electro-hydraulic latches, electronic equipment, other
31.	Discarded electrical and electronic equipment other than those indicated under 20 01 21, 20 01 23 and 20 01 35	20 01 36		0,040	22,940	0,020	0,000	0,000	23,000	El. tools, devices and equipment (used electric machines and electric motors, tools, other)
32.	Plastics	20 01 39	t	0,000	0,090	0,005	0,000	0,015	0,110	Plastic rings, chairs, PET packaging

B. MB KOLUBARA BRANCH – ORGANIZATIONAL UNITS "PRERADA" AND "KOLUBARA METAL"

B.1. OU „PRERADA“

Within Branch MB „Kolubara“ – OU “Prerada” performs the processing and enrichment of raw coal from open cast mines “Field B/C” and “Field D”. Obtained coal is used to supply the power plants, market sale, for industrial consumers, etc.

Within OU “Prerada” there are the following organizational units:

- Operations centre
- Dry separation – unit
- Coal enrichment – unit
 - Wet separation
 - Drying and classification plant
 - Heating plant
 - Maintenance
- Railway transport – unit
- Coal and wastewater testing centre (accredited laboratory)

All units were constructed based on the valid designs and they possess the necessary utilisation permits.

1.1. Overview and Status of Permits

Overview and status of permits for 2021 for OU “Prerada” is given in Table 12.

Table 12

BRANCH MB KOLUBARA - OU„PRERADA“			
Overview and Status of Permits in 2021			
Unit	Permits, licenses and other necessary approvals, obtained in 2021 (number and date). Project name and status	New requests for obtaining or extension of valid permits	Note
OU „Prerada“, Vreoci	Decision - On issuing the Water permit - To the Applicant PE “Electric Power Industry of Serbia” Belgrade, Branch MB Kolubara, - OU "Prerada", a water permit is issued for the supply of technical water (water intake, pumping station, pipeline and access road) from the river Kolubara CM Vreoci, municipality of Lazarevac, for the needs of the unit OU "Prerada"(No. 325-04-0:433/2019-07).	-	Expiry date 14.07.2026
OU „Prerada“, Vreoci	JVP “Srbijavode” issues the water permit with the new validity period to the Applicant PE “Electric Power Industry of Serbia”, Branch MB Kolubara,OU Prerada, for oil derivatives storage for the Heating Plant Unit and discharges atmospheric waste water and steam condensate used to heat fuel oil inside the Heating Plant Unit, Prerada, located on CP 1828/1 CM Vreoci, urban municipality of Lazarevac, Belgrade area, No. 04.08-584512/1-2021).	-	Expiry date 31.10.2024

1.2. Monitoring and Environmental Impact

1.2.1. Air Quality Measurements

No air quality measurements and monitoring were performed within the OU “Prerada” impact zone in 2021. Air quality in the area of the Branch MB “Kolubara” organisational units is monitored by the City of Belgrade automatic air quality monitoring network.

Belgrade automatic air quality monitoring network, under the jurisdiction of the City of Belgrade, inter alia includes the measuring points on the territory of Lazarevac in the town centre, where soot, SO₂, NO₂, O₃ and PM₁₀ are measured.

1.2.2. Emission Measurements of Matters Affecting Air Quality

OU Heating Plant Vreoci is a thermal and power facility generating superheated steam used in technological processes, for heating of industrial facilities and the town of Lazarevac, of the capacity 2x60 MW. Flue gases are treated by an electrostatic precipitator and discharged into the air through an 80m high chimney.

During 2021, individual measurements of matter emissions which affect the air quality were conducted by an accredited laboratory of the Occupational Safety Institute Novi Sad. The Monitoring Programme included measurements of flue gas conditions (temperature, pressure and humidity), flow rate, oxygen content, mass concentrations and emission factors for sulphur dioxide (SO₂), nitrogen oxides (NO_x-NO₂), carbon monoxide (CO), hydrogen chloride, hydrogen fluoride and powdery substances.

Legal compliance was evaluated by comparing the measured emissions prescribed by the Regulation stipulating air pollutants emission limit values (OG RS No. 6/2016) and the Large Combustion Plants Directive 2001/80/EC.

Table 13 provides an overview of the measurement results of individual air pollutants affecting the air quality for the Vreoci Heating Plant conducted in 2021.

Table 13

BRANCH MB KOLUBARA – OU “PRERADA”			
Individual measurements of air pollutants emission affecting air quality in 2021			
Mass concentrations of air pollutants (mg/Nm ³)			
Heat output MWth 120 (2 x 60MW)			
Organisational unit	Heating Plant Vreoci		
Boiler	1	2	2
Date	10.02.2021	09.02.2021	01.12.2021
SO ₂	1.425,93	1.683,96	1.585,06
NO _x (NO ₂)	252,45	173,21	216,21
CO	579,51	713,51	1.370,74
Particulate matter	97,26	95,79	74,26

Note: Pursuant to the Directive on the limitation of emissions of certain pollutants into the air from large combustion plants (Off. Gazette of RS, no. 6/16 and 67/21), Article 5 stipulates that old large combustion plants do not have to comply with individual ELVs if from the date of entry into force of the mentioned Directive they are included in the preliminary application for the National Emission Reduction Plan from the stationary large combustion plants. OC Vreoci is included in the National Emission Reduction Plan.

Table 14 provides an overview of emissions of substances affecting air quality: dust, SO₂, NO₂ and CO₂ for the OU “Prerada” in 2021. Annual emissions have been given on the basis of data obtained from the National Pollution Sources Register – TEAMS.

Table 14

BRANCH MB KOLUBARA– OU “PRERADA”				
Emissions of substances affecting air quality for 2021 (t/year)				
Facility	Heating Plant Vreoci			
	Прашкасте материје	SO ₂	NO _x (NO ₂)	CO ₂
BOILER 1	72,79	1.185,30	172,03	289.347,80
BOILER 2				
TOTAL: MB KOLUBARA BRANCH – OU “PRERADA”	72,79	1.185,30	172,03	289.347,80

Table 15 shows the fuel consumption for the “Prerada” Branch for 2021.

Table 15

BRANCH MB KOLUBARA– OU “PRERADA”		
Fuel consumption in 2021		
Facility	Heating Plant Vreoci	
	t/ year	
	Coal	Fuel oil
BOILER 1	239.267,00	476,50
BOILER 2		
TOTAL: MB KOLUBARA BRANCH – OU “PRERADA”	239.267,00	476,50

1.2.3. Emission Measurements of Substances Affecting Water Quality

Process water is used in the technological process and coal enrichment (Wet Separation, Drying Plant, Heating Plant) from the water intake from the Kolubara River reservoir. The largest process water amounts are used in the OU “Prerada” to generate superheated steam, ash and slag transport and wet coal separation. OU “Prerada” also operates the Vreoci waterworks, supplying potable water to industrial facilities and the Vreoci village.

Wastewater is generated during the technological process of lignite processing and enrichment (Wet Separation, Drying Plant, Heating Plant) - chemical treatment of boiler water and sanitary water treated by the wastewater treatment plant.

Wastewater treatment plant comprises a receiving tank, filter sedimentation tank, fast mixing tank, Emser filters, secondary sedimentation tank, lagoons and purified water collectors. The treated water from the wastewater treatment plant is discharged through the gauge station into a channel and transported to the Kolubara River via a 7km long channel.

The Monitoring Programme includes the following types of water:

- The Kolubara River water upstream of the wastewater discharge;
- Wastewater entering the treatment system;
- Wastewater leaving the treatment system;
- The Kolubara River water downstream of the wastewater discharge.

Testing includes the determination of physical-chemical and microbiological characteristics of water which are of hygiene, water management and technical-technological importance, as follows: water appearance, visible waste materials, water temperature, air temperature, turbidity, colour, pH, sulphates, conductivity, ammonia, total nitrogen, chloride, KMnO4 demand, COD, BOD₅, iron, manganese, and filtered water vaporisation residue, unfiltered water vaporisation residue, suspended solids, particulate matter, phenol matter, arsenic, mineral oil, and microbiological analysis of water.

Quality control of groundwater was performed in 8 piezometers (3 in the vicinity of the wastewater treatment plant and 5 in the vicinity of the ash and slag landfill in Medosevac).

During 2021, testings were carried out by the authorized and accredited laboratory of the Occupational Safety Institute Novi Sad. Reports presenting the quality control of the wastewater and treated water, the Kolubara River water and groundwater within the OU “Prerada” impact zone are submitted to: the Ministry of Environmental Protection, Public Water Company “Srbijavode”, City Administration - Department for Utilities and Housing Services - Water Division, PE Electric Power Industry of Serbia, and the Secretariat (City of Belgrade Environmental Division).

Table 16 shows the groundwater quality data analysis in the vicinity of the wastewater treatment plant. Evaluation of legal compliance was done by comparing the hazardous and harmful substances concentrations values measured in piezometers with remediation values of hazardous and harmful substances concentration and values indicating considerable groundwater contamination.

Table 16

BRNCH MB KOLUBARA -OU "PRERADA"		
Groundwater quality in 2021		
Concentration	PV ¹	Waste water treatment plant
Arsenic (mg/l)	0,06	All measured values were below remediation value (<0,01-0,043)
Phenols (mg/l)	2	All measured values were below remediation value (<0,02)
Mineral oils (mg/l)	0,6	All measured values were below remediation value (<0,01)

PV¹ - remediation values of concentrations of hazardous and harmful substances and values potentially indicating significant groundwater contamination under the Regulation establishing a program of systematic soil quality monitoring, indicators for assessing the risk of soil degradation and remediation programs development methodology (OG RS No. .88/2010 and 30/18)

Table 17 shows an analysis of the groundwater quality data in the vicinity of the ash and slag landfill in Medoševac. Legal compliance was established by comparing the measured values of groundwater pollutants concentrations in piezometers with remediation values of hazardous and harmful substances concentrations and values potentially indicating significant groundwater contamination.

Table 17

BRNCH MB KOLUBARA -OU "PRERADA"		
Groundwater quality in 2021		
Concentration	PV ¹	Medoševac – ash and slag landfill
Arsenic (mg/l)	0,06	All measured values were below remediation value (<0,01)
Phenols (mg/l)	2	All measured values were below remediation value (<0,02)
Mineral oils (mg/l)	0,6	All measured values were below remediation value (<0,01)

Table 18 shows wastewater quality data analysis at the treatment plant inlet and outlet in 2021.

Wastewater treatment plant discharges do not adversely affect the quality of the recipient, i.e. the Kolubara River; there is no significant change in water quality of the Kolubara River.

Table 18

BRNCH MB KOLUBARA -OU "PRERADA"		
Wastewater treatment plant operating results in 2021		
Parameter	Concentration (mg/l)	
	Plant inlet	Plant outlet
Pollutant		
Suspended solids	5.560,00-5.820,00	1.010,00-1.810,00
Organic substances COD	5.489,00-5.680,00	1.449,60-1.532,00
Phenols	3,24-5,22	1,99-2,54
Arsenic	1,26-2,83	1,32-3,23

1.2.4. Emission Measurements of Matters Affecting Soil Quality

During 2021, no physical and chemical soil tests were performed at the location of OU "Prerada", since the previous measurements did not reach the values of pollution that require remediation measures in accordance with the Decree on the program of systematic monitoring of soil quality, indicators for risk assessment land degradation and methodology for the development of remediation programs ("Official Gazette of RS", No. 88/10).

1.2.5. Environmental Noise Measurements

Measurement of noise levels and the impact assessment of industrial plants of OU "Prerada" on the level of noise in the environment in 2021 was performed by the accredited laboratory " Occupational Safety Institute " a.d. Novi Sad. Noise levels were measured at two measuring points, as follows:

- Measuring point 1 is located on the north side of the complex, in the direction of Sušara, about 380 m from the building, 50 m from the railway. In a clean space without buildings and any reflective surfaces in the immediate vicinity.
- Measuring point 2 is located on the south side of the complex, in the direction of Dry Separation, about 200 m from the building, 50 m from the railway. In a clean space without buildings and any reflective surfaces in the immediate vicinity.

Table 19 shows the noise level data for the OU "Prerada" plant in 2021.

The evaluation of measured noise levels was done on the basis of limit values of outdoor noise indicators and relevant noise levels (additional noise indicators) prescribed by the Decree on noise indicators, limit values, methods for assessing noise indicators, harassment and harmful effects of noise on the environment. ("Official Gazette of RS", No. 75 / 10).

Table 19

BRANCH MB KOLUBARA – OU „PRERADA“					
Noise level in 2021 dB (A)					
Limit values of noise indicators Decree on noise indicators, limit values, methods for assessment of noise indicators, harassment and harmful effects of noise in the environment, "Official Gazette of RS", no. 75/10	* Indoors			For day and evening	For night
				35	30
	In open space	Tourist areas, camps and school zones		50	45
		Purely residential areas		55	45
		Business-residential areas, commercial-residential areas and children's playgrounds		60	50
		City center, craft, trade, administrative zone with apartments, zone along highways, main roads and city roads		65	55
Industrial, warehouse, and service areas and transport term without residential buildings		At the border of this zone, the noise must not exceed the noise limit values in the zone with which it borders			
OU Prerada	Measuring point 1		Measuring point 2		
25.01.2021.					
Reference time measurement interval (h)	*L _{Aeq,30min.}	**L _{RAeq,30min.})	*L _{Aeq,30min.}	**L _{RAeq,30min})	
12 For day and evening 06 - 18 o'clock	58,2	58	54,1	54	
	57,4	57	53,6	54	
4 For day and evening 18 - 22 o'clock	55,3	55	52,7	53	

*Noise level L_{Aeq,30min.} dB(A) day and night **Authoritative noise level L_{RAeq,30min.} dB(A)

1.2.6. Waste

Waste amounts generated in 2021 for OU "Prerada" are shown in Table 20 according to Serbian waste management legislation.

Table 20

BRANCH MB KOLUBARA – OU “PRERADA“					
Generated types of waste in 2021					
Official nomenclature of the Rules defining waste categories, its testing and classification (“ Official Gazette” RS No. 56/2010, 93/2019 и 39/2021)					
Number	Name	Index number	Unit	Waste amount	Note
1.	Waste printer cartridges other than the ones specified under y 08 03 17	08 03 18	t	0,110	Waste printer cartridges
2.	Plastic packaging	15 01 02	t	0,180	PET Packaging
3.	Packaging containing residues of hazardous substances or contaminated with hazardous substances	15 01 10*	t	0,100	Waste packaging from grease and oil
4.	Absorbents, filter materials (including oil filters not otherwise specified), wipes, protective clothing, contaminated with hazardous substances	15 02 02*	t	1,200	Oiled filters

BRANCH MB KOLUBARA – OU “PRERADA“					
Generated types of waste in 2021					
Official nomenclature of the Rules defining waste categories, its testing and classification (“ Official Gazette” RS No. 56/2010, 93/2019 и 39/2021)					
Number	Name	Index number	Unit	Waste amount	Note
5.	Laboratory chemicals consisting of or containing hazardous substances	16 05 06*	t	0,028	Chemistry from analysis
6.	Wood	17 02 01	t	80,000	Waste railway sleepers
7.	Iron and steel	17 04 05	t	15,100	Iron and steel over 6 mm
				109,660	Iron and steel over 3 mm
				11,960	Iron and steel below 3 mm
				1,540	Special types of stainless steel
8.	Cables other than those specified under 17 04 10	17 04 11	t	3,680	High voltage cables
9.	Dirt and stone other than those specified under 17 05 03	17 05 04	m ³	150,000	Gravel from the upper layer of the railway
10.	Plastic and rubber	19 12 04/16 01 03	t	42,885	Conveyor belt with canvas
11.	Paper and cardboard	20 01 01	t	3,480	Waste paper and cardboard
12.	Fluorescent tubes and other wastes containing mercury	20 01 21*	t	0,270	Fluorescent tubes
13.	Discarded electrical and electronic equipment other than that specified under 20 01 21, 20 01 23 и 20 01 35	20 01 36	t	14,540	Misc. el. equipment

B.2. OU “KOLUBARA-METAL“

MB “Kolubara” Branch – OU“Kolubara-Metal” performs designing, manufacturing, assembly and maintenance of mining, energy and processing equipment.

“Kolubara-Metal” comprises of the following organizational parts, with short descriptions of technological processes:

- Operations Centre;
- Manufacturing unit: mechanical and thermal treatment of materials and moulding, machine parts washing, washing oily and greasy surfaces of spare parts;
- Overhaul unit: overhaul of mining equipment, machine parts washing, cleaning of oily and greasy surfaces of spare parts;
- Unit Montaža, relocated from the OU complex, performs electromechanical assembly of mining, processing and thermal power equipment and facilities;
- Unit ELMONT, relocated from the OU complex, manufactures spare parts and assemblies workshops, revitalization and regeneration of electrical equipment, maintenance of power and on site telecommunication facilities, car and electrical equipment washing;
- Maintenance.

All the above units were constructed based on the valid designs and they possess utilisation permits.

1.1. Overview and Status of Permits

There were no new permits for Kolubara-Metal in 2021. Overview and status of inspections and decisions are given in the Table 21.

Table 21

BRANCH “MB KOLUBARA” – “KOLUBARA-METAL” OU		
Review and status of inspection controls and solutions in 2021		
No.	Mark	Name
1.	501-67/2021-08, 02.11.2021.	Order for office inspection supervision in the ELMONT Unit
2.	501-67/2021-08 18.11.2021.	ELMONT Unit Inspection Record

1.2. Monitoring and Environmental Impact

1.2.1. Emission Measurements of Substances Affecting Air Quality

In accordance with the Law and Decision of Environmental Protection Inspector of the competent Ministry, OU Kolubara-Metal shall measure air emissions from the production capacities within Production Unit as well as boiler emission measurements within Montaža and ELMONT Units.

In accordance with the Contract no. E-04.04-33 / 393-2020 dated 28.12.2020 for the "Air Quality Analysis" service, individual measurements of pollutant emissions into the air were performed by the accredited laboratory of the "Occupational Safety Institute" a.d. Novi Sad. The inspection program includes measurement of flue gas condition (temperature, pressure and humidity), flow rate, as well as mass concentrations and emission factors for sulfur dioxide (SO₂), nitrogen oxides (NO_x - NO₂), powdery substances and organic compounds expressed as total carbon.

The measured emission values were compared with the emission limit values prescribed by the Regulation. The results of emission measurements are shown in Tables 22 and 23 per measuring points.

Table 22

BRANCH "MB KOLUBARA" – OU "KOLUBARA-METAL"		
Emission Measurements of Substances Affecting Air Quality in 2021 – Montaža Unit		
Emitted substance	Montaza Unit coal-fired boiler (E _m) (mg/Nm ³)	ELV (mg/Nm ³)
CO	3.542,79	350
SO ₂	134,31	1.700
Nitrogen oxides expressed as NO ₂	1.262,65	650
Powdery substances	No measurements were performed	150

E_m- the highest value of emission measurement results reduced by the value of the measurement uncertainty.

Table 23

BRANCH "MB KOLUBARA" – OU "KOLUBARA-METAL"		
Emission Measurements of Substances Affecting Air Quality in 2021 – ELMONT Unit		
Emitted substance	ELMONT Unit- coal-fired boiler (E _m) (mg/Nm ³)	ELV (mg/Nm ³)
CO	1.001,20	350
SO ₂	961,62	1.700
Nitrogen oxides expressed as NO ₂	122,04	650
Powdery substances	171,63	150

E_m- the highest value of emission measurement results reduced by the value of the measurement uncertainty.

The measuring results of the emission of pollutants into the air from production capacities within the Production unit are shown in Tables 24, 25 and 26 for two series of measurements (the first during the heating season and the second outside the heating season), per measuring points.

Table 24

BRANCH "MB KOLUBARA" – OU "KOLUBARA-METAL"			
Emission Measurements of Substances Affecting Air Quality in 2021 – Production unit			
Emitted substance	Production unit— "GOSTOL" line (E _m) (mg/Nm ³)	Production unit— Steel Structure Hall (left outlet) (E _m) (mg/Nm ³)	ELV (mg/Nm ³)
Nitrogen oxides expressed as NO ₂	<2,05	<2,05	350
SO ₂	<2,86	<2,86	350
Powdery substances	7,58	9,79	150

E_m- the highest value of emission measurement results reduced by the value of the measurement uncertainty.

Table 25

BRANCH "MB KOLUBARA" – OU "KOLUBARA-METAL"				
Emission Measurements of Substances Affecting Air Quality in 2021 – Production unit				
Emitted substance	Production unit— "GOSTOL" line (E _m) (mg/Nm ³)	Production unit— Steel Structure Hall (left outlet) (E _m) (mg/Nm ³)	Production unit— Steel Structure Hall (right outlet) (E _m) (mg/Nm ³)	ELV (mg/Nm ³)
Nitrogen oxides expressed as NO ₂	<2,05	<2,05	<2,05	350
SO ₂	<2,86	<2,86	<2,86	350
Powdery substances	1,61	0,76	1,20	150

E_m- the highest value of emission measurement results reduced by the value of the measurement uncertainty.

Table 26

BRANCH "MB KOLUBARA" –OU "KOLUBARA-METAL"			
Emission Measurements of Substances Affecting Air Quality in 2021 – Production unit			
Emitted substance	Production unit — Varnish shop/line two два- left outlet (E _m) (mg/Nm ³)	Production unit — Varnish shop/line two- right outlet (E _m) (mg/Nm ³)	ELV (mg/Nm ³)
Organic compounds expressed as total carbon (C)	105,56	95,28	75

E_m- the highest value of emission measurement results reduced by the value of the measurement uncertainty.

The measured emission values during the heating season for the second series of measurements were compared with the emission limit values prescribed by the Regulation. The results of emission measurements are shown in Tables 27 and 28 at measuring points.

Table 27

BRANCH "MB KOLUBARA" –OU "KOLUBARA-METAL"		
Emission Measurements of Substances Affecting Air Quality in 2021– Montaža Unit		
Emitted substance	Montaza Unit coal-fired boiler (E _M) (mg/Nm ³)	ELV (mg/Nm ³)
CO	2.823,78	350
SO ₂	1.304,61	1.700
Nitrogen oxides expresses as NO ₂	128,98	650
Powdery substances	No measurements were performed	150

E_M- the highest value of emission measurement results reduced by the value of the measurement uncertainty.

Table 28

BRANCH "MB KOLUBARA" –OU "KOLUBARA-METAL"		
Emission Measurements of Substances Affecting Air Quality in 2021 – ELMONT unit		
Emitted substance	ELMONT Unit coal-fired boiler (E _M) (mg/Nm ³)	ELV (mg/Nm ³)
CO	930,14	350
SO ₂	917,94	1.700
Nitrogen oxides expresses as NO ₂	100,26	650
Powdery substances	259,95	150

E_M- the highest value of emission measurement results reduced by the value of the measurement uncertainty.

1.2.2. Emission Measurements of Substances Affecting Water Quality

Treated water from the wastewater treatment plant (separator), installed at washing points of mining equipment and car parts, as well as regenerated parts of equipment for excavators, flows into atmospheric wastewaters collectors and is conveyed from the OU Kolubara-Metal via storm drainage into the PUTOKS plant and subsequently over a channel into the Kolubara River.

According to the Water Law (OG RS No. 30/10, 93/12,101/16 and 95/18), wastewater and treated water from the OU Kolubara Metal plants was controlled by the authorized and accredited laboratory.

In accordance with the Contract No.20600-E.04.04-102671/17-2021 as of 18.08.2021, testing was conducted by the authorized and accredited laboratory of the Occupational Safety Institute a.d. Novi Sad. Two series of wastewater and treated water quality testing were performed. Testing included physical-chemical and microbiological characteristics of water of hygienic, water management and technical-technological importance, as follows: water appearance, visible waste substances, water temperature, air temperature, turbidity, colour, pH value, sulphates, specific conductivity, ammonia, total nitrogen, chloride, KMnO₄ demand, COD, BOD₅, iron, manganese, filtered water vaporisation residue, unfiltered water vaporisation residue, suspended solids, particulate matter, total phosphates, phenols, arsenic, mineral oil, and microbiological analysis of water. Physical-chemical wastewater testing results are given in Tables 29. and 30.

Table 29

BRANCH KOLUBARA MB – OU "KOLUBARA-METAL"							
Wastewater physical-chemical testing in 2021 – third quarter							
Tested parameter	Measured value						Reference value *
	I	II	III	IV	V	VI	
Water temperature (°C)	-	-	24,0	-	22,2	24,6	30
Turbidity (NTU)	-	-	8,59	-	15,8	73,7	-
Conductivity (µS/cm)	-	-	687	-	787	887	-
Total phosphorus (mg/l)	-	-	0,159	-	1,21	0,147	-
Fe (mg/l)	-	-	-	-	1,04	11,33	-
Mn (mg/l)	-	-	0,021	-	0,187	0,929	-
As (mg/l)	-	-	0,016	-	0,017	0,079	-
Mineral oil (TPH) (mg/l)	-	-	<0,01	-	0,447	0,036	10
Total number of faecal coliform bacteria (cfu/100ml)	-	-	4,1x10 ³	-	1,1x10 ³	2,4x10 ³	-

Table 30

BRANCH KOLUBARA MB – OU “KOLUBARA-METAL“							
Wastewater physical-chemical testing in 2021 – fourth quarter							
Tested parameter	Measured value						Reference value *
	I	II	III	IV	V	VI	
Water temperature (°C)	12,1	10,9	18,9	13,5	19,3	10,2	30
Turbidity (NTU)	277	61,2	8,51	601	157	233	-
Conductivity (µS/cm)	345	422	625	611	581	719	-
Total phosphorus (mg/l)	0,142	0,98	0,167	0,30	1,30	0,026	-
Fe (mg/l)	2,82	0,918	0,604	6,03	4,80	8,07	-
Mn (mg/l)	0,225	0,365	0,092	0,218	0,183	0,888	-
As (mg/l)	0,015	<0,01	<0,01	<0,01	0,022	0,051	-
Mineral oil (TPH) (mg/l)	3,062	1,41	0,052	0,032	0,084	0,274	10
Total number of faecal coliform bacteria (cfu/100ml)	60	5,6x10 ³	1,1x10 ⁴	60	1,0x10 ⁴	3,2x10 ³	-

* Reference value: Regulation stipulating emission limit values for pollutants in water and deadlines for their achievement (OG RS, No. 67/2011, 48/2012 and 1/2016). Emission limit values for wastewater containing mineral oils, Table 4.1. Emission limit values at the point of discharge into surface waters.

Measuring points I, II, IV и VI are outlets from the separator inside the Manufacturing Unit, Overhaul Unit and ELMONT in Lajkovac, while measuring points III and V are storm drainage outlets from the Manufacturing Unit and Overhaul Unit.

During sampling at individual measuring points, no samples were taken at the inlets due to separator clogging. Some of the presented results do not provide a realistic image of the separator efficiency due to the clogging and abundant precipitation within the intervals before and after sampling.

1.2.3. Waste

Waste amounts generated in 2021 for OU “Kolubara Metal“, are shown in the Table 31 according to Serbian waste management legislation.

Table 31

BRANCH MB KOLUBARA - OU “KOLUBARA - METAL“					
Generated types of waste in 2021					
Official nomenclature of the Rules defining waste categories, its testing and classification (OG RS No. 56/2010, 93/2019 and 39/2021)					
Number	Name	Index number	Unit	Waste amount	Note
1.	Scraping and processing of ferrometals	12 01 01	t	223,512	Metal scrapings
2.	Scraping and processing of non-ferrous metals	12 01 03	t	6,370	Waste bronze scrapings
3.	Mineral non-chlorinated hydraulic oils	13 01 10*	t	6,640	Waste hydraulic opils
4.	Mineral non-chlorinated motor oils, transmission oils and lubricants	13 02 05*	t	4,170	Waste motor oil
5.	Other emulsions	13 08 02*	t	26,840	Sludge from the washing area
6.	Wastes not otherwise specified	13 08 99*	t	15,680	Oils from heat treatment
7.	Packaging containing residues of hazardous substances or contaminated with hazardous substances	15 01 10*	t	1,300	Waste barrels from grease and oil
8.	Packaging containing residues of hazardous substances or contaminated with hazardous substances	15 01 10*	t	2,057	Metal packaging of paints, varnishes and thinners
9.	Absorbents, filter materials (including oil filters not otherwise specified), wipes, protective clothing, contaminated with hazardous substances	15 02 02*	t	3,407	Oily wiping cloth, working suits

BRANCH MB KOLUBARA - OU "KOLUBARA - METAL"					
Generated types of waste in 2021					
Official nomenclature of the Rules defining waste categories, its testing and classification (OG RS No. 56/2010, 93/2019 and 39/2021)					
Number	Name	Index number	Unit	Waste amount	Note
10.	Waste rubber	16 01 03	t	9,460	Waste tires from vehicles (Pneumatics)
11.	Lead batteries	16 06 01*	t	1,010	Lead-acid batteries
12.	Nickel-cadmium batteries	16 06 02*	t	2,440	Nickel-cadmium batteries
13.	Copper, bronze, brass	17 04 01	t	1,720	Copper lacquer wire
14.	Copper, bronze, brass	17 04 01	t	0,800	Bronze in one piece
15.	Aluminium	17 04 02	t	22,760	Waste aluminum ropes with steel core
16.	Iron and steel	17 04 0 5	t	9,150	Under 3 mm (sheet metal, profiles, cabinets, mixed categories...)
		17 04 05	t	490,273	Over 3 mm (pieces of various sizes and shapes, unclassified, steel ropes, sheets, steel body idlers, structures, crates...)
		17 04 05	t	219.375	Iron over 6 mm (rails, structure parts,...)
		17 04 05	t	131,090	Damaged parts, gears, axles, shafts
		17 04 05	t	22,520	With rubber coating (upholstered idler)
		17 04 05	t	5,400	Wasted measuring, cutting and hand tools
17.	Metal waste contaminated with hazardous substances	17 04 09*	t	111,270	Greased roller bearings
18.	Insulating materials other than that specified under 17 06 01 and 17 06 03	17 06 04	t	0,060	Waste sandwich panels
19.	Other wastes (including mixtures of materials) from mechanical treatment of waste containing hazardous substances	19 12 11*	t	18,290	Greased rubber-plastic seals
20.	Discarded electrical and electronic equipment other than that specified under 20 01 21 and 20 01 23 and 20 01 35	20 01 36	t	1,000	Telephone cables

The cumulative amount of waste for the Kolubara MB (Open Cast Mines "Baroševac", OU"Prerada" and "Kolubara-Metal") generated in 2021 is presented in Table 32, in line with the Serbian waste management legislation.

Table 32

KOLUBARA MB BRANCH – OU OPEN CAST MINES, OU PRERADA AND OU KOLUBARA METAL														
Number	The Rulebook on Categories, Testing and Classification of Waste ("RS Official Gazette" no. 56/2010, 93/2019 and 39/2021)		Measuring unit	Number										Note
				"Field D"	"Field B"	"Tamnava West Field"	"Tamnava East Field"	Auxiliary Machinery	Total: OCM	Total: Prerada	Total: Kolubara Metal	Total: Mb Kolubara		
				Name	Index number	Generated waste amount								
1.	Waste printer cartridges for printing other than that specified in 08 03 17	08 03 18	t	0,008	0,000	0,032	0,010	0,000	0,050	0,110	0,000	0,160	Waste printer cartridges	
2.	Scraping and processing of ferrometals	12 01 01	t	20,000	10,680	0,000	0,000	0,000	30,680	0,000	223,512	254,192	Iron and steel shavings, metal scrapings, clean waste ferrometal scrapings without impurities, ferrous metal waste scrapings with impurities	
3.	Scraping and processing of non-ferrous metals	12 01 03	t	0,350	0,000	0,000	0,000	0,000	0,350	0,000	6,370	6,720	Non-ferrous metal shavings, waste bronze scrapings	
4.	Used wax and lubricants	12 01 12*	t	0,000	0,000	0,000	0,790	0,000	0,790	0,000	0,000	0,790	Waste lubricants	
5.	Mineral non-chlorinated hydraulic oils	13 01 13*/13 01 10*	t	1,300	0,000	1,592	0,000	0,000	2,892	0,000	6,640	9,532	Hydraulic oils	
6.	Mineral non-chlorinated motor oils, transmission oils and lubricants	13 02 05*	t	0,800	3,000	4,500	2,290	139,613	150,203	0,000	4,170	154,373	Motor oil, gear oils	
7.	Other oils for insulation and heat transfer	13 03 10*	t	0,400	0,500	0,000	0,000	0,000	0,900	0,000	0,000	0,900	Transformer oil	
8.	Oily water from oil/water separators	13 05 07*	t	0,000	0,000	0,000	0,000	65,180	65,180	0,000	0,000	65,180	Sludge from separators, liquid waste from the oil pit (emulsion)	
9.	Other emulsions	13 08 02*	t	2,740	8,620	9,460	0,000	14,200	35,020	0,000	26,840	61,860	Mechanical emulsions and solutions without halogenated matters, Waste sludge from washing points	

KOLUBARA MB BRANCH – OU OPEN CAST MINES, OU PRERADA AND OU KOLUBARA METAL													
Number	The Rulebook on Categories, Testing and Classification of Waste ("RS Official Gazette" no. 56/2010, 93/2019 and 39/2021)		Measuring unit	Number									Note
				"Field D"	"Field B"	"Tamnava West Field"	"Tamnava East Field"	Auxiliary Machinery	Total: OCM	Total: Prerada	Total: Kolubara Metal	Total: Mb Kolubara	
				Name	Index number	Generated waste amount							
10.	Waste not otherwise specified	13 08 99*	t	0,000	0,000	2,000	0,000	0,000	2,000	0,000	15,680	17,680	Grease and oils with impurities
11.	Plastic containers	15 01 02	t	0,000	0,000	0,000	0,000	0,000	0,000	0,180	0,000	0,180	PET containers
12.	Packaging containing residues of hazardous substances or is contaminated by hazardous substances	15 01 10*	t	0,000	0,350	0,300	0,000	14,620	15,270	0,100	3,357	18,727	Waste metal barrels from oil and lubricants, waste barrels from oil and lubricants, metal packaging of paints, varnishes and thinners
13.	Absorbent and filter materials (including oil filters not otherwise specified) wiping cloths, protective clothing contaminated by hazardous substances	15 02 02*	t	0,400	0,000	1,502	0,500	0,345	2,747	1,200	3,407	7,354	Oil and air filters, oilywiping cloth, working clothes, wiping cloth
14.	Absorbent, filter materials, wiping cloths and protective clothing, not otherwise specified in 15 02 02	15 02 03	t	0,500	0,630	0,000	0,000	5,217	6,347	0,000	0,000	6,347	Safety equipment, working clothes, personal protective items, air filters
15.	Used tires	16 01 03/19 12 12	t	0,000	0,000	0,000	0,000	65,790	65,790	0,000	9,460	75,250	Pneumatics
				100,000	8,820	0,000	0,000	0,000	108,820	0,000	0,000	108,820	Conveyor belt with steel cord, sealing rubber, scrapers, idler rings
16.	Waste vehicles not containing liquids or any other dangerous components	16 01 06	t	0,000	0,000	0,000	0,000	200,000	200,000	0,000	0,000	200,000	Discarded vehicles not containing liquids or any other dangerous components
17.	Oil filters	16 01 07*	t	0,000	0,000	0,000	0,000	4,517	4,517	0,000	0,000	4,517	Waste oil filters
18.	Brake pads containing asbestos	16 01 11*	t	0,500	0,000	0,000	0,000	0,300	0,800	0,000	0,000	0,800	Waste from asbestos braids and brake linings

KOLUBARA MB BRANCH – OU OPEN CAST MINES, OU PRERADA AND OU KOLUBARA METAL														
Number	The Rulebook on Categories, Testing and Classification of Waste ("RS Official Gazette" no. 56/2010, 93/2019 and 39/2021)		Measuring unit	Number										Note
				"Field D"	"Field B"	"Tamnava West Field"	"Tamnava East Field"	Auxiliary Machinery	Total: OCM	Total: Prerada	Total: Kolubara Metal	Total: Mb Kolubara		
				Generated waste amount										
Name	Index number													
19.	Dangerous components other than specified in 16 01 07 to 16 01 11 and 16 01 13 and 16 01 14	16 01 21*	t	0,000	0,000	0,000	0,000	0,500	0,500	0,000	0,000	0,500	Greasy hydraulic hoses	
20.	Waste not otherwise specified	16 01 99/17 04 05	t	0,000	0,000	0,000	0,000	2.045,000	2.045,000	0,000	0,000	2.045,000	Waste construction machinery and their parts	
21.	Discarded equipment containing dangerous components other than specified in 16 02 09 to 16 02 12	16 02 13*	t	0,000	3,900	0,000	0,000	0,000	3,900	0,000	0,000	3,900	Mercury-containing power rectifiers	
22.	Laboratory chemicals consisting of or containing dangerous substances, including the mixtures of lab. chemicals	16 05 06*	t	0,000	0,000	0,003	0,000	0,000	0,003	0,028	0,000	0,031	Lab. chemicals	
23.	Lead batteries	16 06 01*	t	0,000	0,360	1,900	0,000	14,883	17,143	0,000	1,010	18,153	Lead batteries	
24.	Nickel-cadmium batteries	16 06 02*	t	0,000	0,000	0,000	0,000	0,000	0,000	0,000	2,440	2,440	Nickel-cadmium batteries	
25.	Wood	17 02 01	t	0,000	0,000	0,000	0,000	0,000	0,000	80,000	0,000	80,000	Waste railway sleepers	
26.	Copper, bronze, brass	17 04 01	t	0,320	0,882	0,000	0,000	0,000	1,202	0,000	2,520	3,722	Copper, copper strips, copper lacquer wire, insulated copper coils, scrap tin bronze, scrap aluminum bronze	
27.	Aluminum	17 04 02	t	0,000	0,780	0,000	0,000	0,000	0,780	0,000	22,760	23,540	Waste aluminum sheets, connectors	
28.	Iron and steel	17 04 05	t	41,000	70,160	9,190	3,000	0,000	123,350	0,000	0,000	123,350	(Alloy steel crawler platforms, crusher	

KOLUBARA MB BRANCH – OU OPEN CAST MINES, OU PRERADA AND OU KOLUBARA METAL												
Number	The Rulebook on Categories, Testing and Classification of Waste ("RS Official Gazette" no. 56/2010, 93/2019 and 39/2021)		Measuring unit	Number								Note
				"Field D"	"Field B"	"Tamnava West Field"	"Tamnava East Field"	Auxiliary Machinery	Total: OCM	Total: Prerada	Total: Kolubara Metal	
Name		Index number	Generated waste amount									
											hammers, excavator teeth)	
			4,000	6,480	0,000	0,000	0,000	10,480	0,000	22,520	33,000	Iron and steel with rubber coating, upholstered idlers
			10,000	253,660	0,000	0,000	0,000	263,660	15,100	219,375	498,135	Iron over 6 mm (rails, structure parts, idlers and shafts)
			13,000	150,047	0,000	34,000	0,000	197,047	11,960	9,150	218,157	Iron and steel up to 3 (steel sheets switching cabinets,. vul.houses, sheet metal profiles, cabinets of mixed category)
			154,500	105,200	1.014,165	1,700	0,000	1.275,565	109,660	490,273	1.875,498	Iron and steel over 3 mm (steel sheets, idlers, shafts, structures, steel ropes, pieces of various sizes and shapes, unclassified, steel ropes, sheets, steel body idlers, structures, crates, pontoons, rails)
			0,000	0,000	0,000	0,000	0,000	0,000	0,000	131,090	131,090	Damaged parts, gears, shafts, axles
			0,000	0,000	0,000	0,000	0,000	0,000	0,000	5,400	5,400	Spent measuring, cutting and hand tools
			0,000	0,000	0,000	0,000	0,000	0,000	1,540	0,000	1,540	Special types of stainless steel

KOLUBARA MB BRANCH – OU OPEN CAST MINES, OU PRERADA AND OU KOLUBARA METAL													
Number	The Rulebook on Categories, Testing and Classification of Waste ("RS Official Gazette" no. 56/2010, 93/2019 and 39/2021)		Measuring unit	Number									Note
				"Field D"	"Field B"	"Tamnava West Field"	"Tamnava East Field"	Auxiliary Machinery	Total: OCM	Total: Prerada	Total: Kolubara Metal	Total: Mb Kolubara	
				Name	Index number	Generated waste amount							
29.	Waste from metal contaminated with hazardous substances	17 04 90*	t	0,000	0,000	0,000	0,000	0,000	0,000	0,000	111,270	111,270	Oily bearings from idlers
30.	Cables other than those mentioned in 17 04 10	17 04 11	t	7,320	39,360	45,000	0,800	0,000	92,480	3,680	0,000	96,160	High voltage copper cables with insulation
				2,680	0,000	0,000	0,000	0,000	2,680	0,000	0,000	2,680	Low voltage copper cables with insulation
				0,000	0,000	1,000	0,000	0,000	1,000	0,000	0,000	1,000	Telephone cords
31.	Soil and rock other than specified in 17 05 03	17 05 04	m ³	0,000	0,000	0,000	0,000	0,000	0,000	150,000	0,000	150,000	Crushed stone from the upper layer of the track
32.	Insulating materials containing asbestos	17 06 01*	t	0,420	0,000	0,000	0,000	0,000	0,420	0,000	0,000	0,420	Building insulation boards containing asbestos, hardboards
33.	Insulating materials other than specified in 17 06 01 and 17 06 03	17 06 04	t	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,060	0,060	Waste sandwich panels
34.	Plastics and rubber	19 12 04	t	0,000	0,000	19,220	0,000	0,000	19,220	42,885	0,000	62,105	Scrapers, sealing rubber, rubber rings, conveyor belt with canvas
35.	Other waste (including mixtures from mechanical treatment containing hazardous substances)	19 12 11*	t	0,000	0,000	0,000	0,000	0,000	0,000	0,000	18,290	18,290	Greased rubber-plastic seals and hydraulic hoses
36.	Paper and cardboard	20 01 01	t	0,000	0,000	0,000	0,000	0,000	0,000	3,480	0,000	3,480	Waste paper and cardboard
37.	Pesticides	20 01 19*	t	0,100	0,000	0,000	0,000	0,000	0,100	0,000	0,000	0,100	Waste pesticides and insecticides
38.	Fluorescent tubes and other waste containing mercury	20 01 21*	t	0,000	0,000	0,000	0,000	0,000	0,000	0,270	0,000	0,270	Fluorescent tubes

KOLUBARA MB BRANCH – OU OPEN CAST MINES, OU PRERADA AND OU KOLUBARA METAL													
Number	The Rulebook on Categories, Testing and Classification of Waste ("RS Official Gazette" no. 56/2010, 93/2019 and 39/2021)		Measuring unit	Number									Note
				"Field D"	"Field B"	"Tamnava West Field"	"Tamnava East Field"	Auxiliary Machinery	Total: OCM	Total: Prerada	Total: Kolubara Metal	Total: Mb Kolubara	
				Name	Index number	Generated waste amount							
39.	Discarded electrical and electronic equipment other than those indicated under 20 01 21 and 20 01 23 containing hazardous components	20 01 35*	t	0,000	0,297	0,000	0,500	0,000	0,797	0,000	0,000	0,797	Electro-hydraulic thrustors, electronic equipment, other
40.	Discarded electrical and electronic equipment other than those indicated under 20 01 21, 20 01 23 and 20 01 35	20 01 36	t	0,040	22,940	0,020	0,000	0,000	23,000	14,540	1,000	38,540	El.tools, devices and equipment (used electric machines and electric motors, tools, other)
41.	Plastics	20 01 39	t	0,000	0,090	0,005	0,000	0,015	0,110	0,000	0,000	0,110	Plastic rings, deck chairs, PET packaging

Table 33 provides the implementation of the takeover amount of waste that Branch MB "Kolubara" had in the period from 1st January – 31st December 2021.

Table 33

BRANCH MB KOLUBARA			
Takeover amount of waste in 2021			
Item No.	Waste name	Waste index number	Takeover amount (kg)
1.	Waste printer cartridges	08 03 18	1.720,000
2.	Scraping and processing of ferrous metals – waste ferrometal waste shaving with various impurities and soil	12 01 01	359.680,000
3.	Scraping and processing of ferrous metals – pure waste shaving of ferrous metals without impurities	12 01 01	38.540,000
4.	Scraping and processing of non-ferrous metals – copper waste shaving	12 01 03	2.500,000
5.	Air filters	15 02 03	1.260,000
6.	Incomplete spent construct. mechanization	16 01 99/17 04 05	973.080,000
7.	Waste car tires – pneumatics	16 01 03	37.060,000
8.	Waste tires (conveyor belt with textile core)	16 01 03	76.980,000
9.	Waste vehicles not containing liquids or any other dangerous components	16 01 06	167.320,000
10.	Lead batteries (lead-acid batteries)	16 06 01*	22.920,000
11.	Aluminum bronze	17 04 01	1.060,000
12.	Aluminum ropes with steel cords	17 04 02	11.000,000
13.	Copper lacquer wire, copper windings with insulation	17 04 01	1.480,000
14.	Waste aluminum (sheets, ropes)	17 04 02	1.580,000
15.	Iron and steel – (spoons, pontoons, shoes, circum chutes, rolls, shafts, structure parts...)	17 04 05	123.520,000
16.	Iron and steel – spent measuring, cutting and hand tools	17 04 05	5.400,000
17.	Iron and steel up to 3 mm	17 04 05	287.520,000
18.	Iron and steel over 3 mm	17 04 05	1.471.940,000
19.	Iron and steel over 6 mm	17 04 05	803.460,000
20.	Iron and steel with rubber coating (rolls and drums)	17 04 05	9.480,000
21.	Alloy steel (slipper segments, crusher hammers, excavator teeth, impact plates)	17 04 05	274.600,000
22.	LV, HV cables, also with cop. insulation	17 04 11	34.140,000
23.	Waste rubber rings	19 12 04	34.400,000
24.	Paper and cardboard	20 01 01	3.480,000
25.	Discarded electrical and electronic equipment (electro motors, tools, devices, appliances, phones, other)	20 01 36	37.800,000
26.	Waste plastics and plastic containers	20 01 39/15 01 02	180,000
27.	Waste plastics (plastic rings, deck chairs, barrels)	20 01 39	1.100,000
TOTAL: BRANCH MB KOLUBARA			4.783.200,000

Table 34 shows an overview of the realization of the disposed waste of Branch MB "Kolubara" in the period from 1st January – 31st December 2021.

Table 34

BRANCH MB KOLUBARA			
Disposed waste in 2021			
Item No.	Waste name	Waste index number	Takeover amount (kg)
1.	Oily water from oil/water separators -cleaning grease and oil separators	13 05 07*	65.180,000
2.	Other emulsions - cleaning of existing washing points and sludge from washing points	13 08 02*	33.620,000
3.	Other emulsions - machine emulsions and solutions not containing halogens	13 08 02*	32.320,000
4.	Packaging containing residues of hazardous substances or contaminated with hazardous substances - packaging of paints, varnishes and thinners	15 01 10*	1.640,000
5.	Contaminated absorbents, oily wiping cloth, wipes and protective clothes	15 02 02*	2.880,000
6.	Asbestos boards used for insulating the facilities, roof covers containing asbestos substances	17 06 01*	2.960,000
7.	Other wastes (including mixtures of materials) from mechanical treatment of wastes containing hazardous substances - greasy rubber-plastic seals and hydraulic hoses	19 12 11*	100,000
8.	Fluorescent tubes and other wastes containing mercury	20 01 21*	220,000
TOTAL: BRANCH MB KOLUBARA			138.920,000

1.3. Working Environment Monitoring, Occupational Health and Safety

The 2021 Occupational Safety and Health Reports include the following elements:

- **Working Environment Monitoring**
 - working environment noise measurement
- **Occupational Safety**
 - personnel training
 - work injuries
- **Health**

1.3.1. Working Environment Monitoring

Working environment noise levels measurements results are provided in Table 35.

Table 35

BRANCH MB KOLUBARA			
Working environment noise for 2021			
Организациона јединица	Plant	Registered noise level (dB(A))	Permitted noise level (dB(A))
Open Cast Mines	In 2021 there were no measurements		
Processing Plant	In 2021 there were no measurements		
Metal	In 2021 there were no measurements		
Headquarter	In 2021 there were no measurements		
Project	In 2021 there were no measurements		

1.3.2. Occupational Safety

Analysis of high-risk jobs was carried out and it was established that such workplaces (jobs) are adequately protected in line with legislation.

▪ Personnel Training

Occupational health and safety training is conducted when new employees are recruited, when existing employees are transferred to other positions, when new technologies and tools are introduced. Trainings are both theoretical and practical.

Theoretical (general) training is performed by the Health and Safety Division introducing normative acts in the field of occupational safety and health to employees. Practical training is conducted at the workplace and implemented by line managers. Theoretical training of newly recruited employees and the ones transferred to new positions is performed regularly.

In 2021, occupational health and safety training was performed for 2,393 persons in MB "Kolubara" (employment, transfer to other positions, contractors, students employed under temporary and provisional contracts). Apart from those persons previously mentioned, the training and knowledge checks through tests is regularly being done by all the employees in MB Kolubara. This accounts for 9,194 employees.

Under the Law on Mining and Geological Exploration, Occupational Health and Safety Law, Law on Fire Protection, OHS Regulations, and FP Regulations, the employer is under the obligation to perform OHS and FP testing of employees.

The training of employees is conducted in accordance with "Occupational Health and Safety Training Programme". Training and testing is conducted for employees working at job positions with higher risk, as well as for employees working at job positions that are not of higher risk.

Knowledge checks from the field of OHS and FP are compulsory for every employee of Branch MB Kolubara.

Table 36 shows the overview of the number of employees who have undergone the knowledge checks.

Table 36

BRANCH MB KOLUBARA			
Knowledge test in 2021			
Business Unit	Invited	Tested	%
Open Cast Mines	6.011	5.329	88,65
Processing Plant	1.437	1.394	97,01
Metal	1.378	1.352	98,11
Headquarter	1.169	1.119	95,72
Project	0	0	0,00
TOTAL: BRANCH MB KOLUBARA	9.995	9.194	91,99

▪ Work injuries

Table 37 provides the 2021 work injuries data.

Table 37

BRANCH MB KOLUBARA						
Work injuries in 2021						
Business Unit	Number of employees	Injuries – employees ratio				
		Minor	Severe	Fatal	Total	%
Open Cast Mines	6.580	110	31	0	141	2,14
Processing Plant	1.427	5	5	0	10	0,70
Metal	1.842	25	11	0	36	1,95
Headquarter	1.513	10	5	0	15	0,99
Project	84	0	0	0	0	0,00
TOTAL: BRANCH MB KOLUBARA	11.446	150	52	0	202	1,76

1.3.3. Health Protection

Medical examinations are performed by the Occupational Health Department of „Đorđe Kovačević” Lazarevac Medical Centre. Periodic medical examinations are performed annually, and employees

working in high-risk workplaces and those operating at computer screens are referred to examination.

Table 38 presents periodic examinations data for employees working in high-risk workplaces in 2021.

Table 38

BRANCH MB KOLUBARA											
Employees' work capability in 2021											
Business unit	Number of employees	Previous and periodical examinations				Work capability					
		Referred to examination		Examined		Capable		Limited Capability		Incapable	
		No.	%	No.	%	No.	%	No.	%	No.	%
Open Cast Mines	6.580	6.257	95,09	5.721	91,43	3.755	65,64	1.826	31,92	140	2,45
Processing Plant	1.427	1.146	80,31	1.117	97,47	749	67,05	346	30,98	22	1,97
Metal	1.842	1.214	65,91	1.200	98,85	938	78,17	225	18,75	37	3,08
Headquarter	1.513	1.513	100,00	1.219	80,57	1.095	89,83	123	10,09	1	0,08
Project	84	84	100,00	76	90,48	71	93,42	5	6,58	0	0,00
TOTAL: BRANCH MB KOLUBARA	11.446	10.214	89,24	9.333	91,37	6.608	70,80	2.525	27,05	200	2,14

1.4. Public Submissions

Public Submissions for 2021 are shown in the Table 39.

Table 39

BRANCH MB KOLUBARA			
Public Submissions in 2021			
Business unit	Submissions (number, date and by whom submitted)	Complaint subject	Measures taken
Plant Tamnava East Field	NGO „Tihi Lug“ 20-24.05.2021.	Quality of air and noise	As a measure defined by the Monitoring Report, it is planned to measure the concentration of PM ₁₀ (10 days) and UTM (15 days) in Veliki Crljeni (impact zone of the former PK "Veliki Crljeni" and measurement of environmental noise (same impact zone)). The authorized laboratories conducted the measurements and, in accordance with the Minutes, submitted the results to the inspectors within the planned deadline. No exceedances were found during the measurement.

2. BRANCH TPP & OCM KOSTOLAC – OPEN CAST MINES

Branch TPP-OCM "Kostolac" is comprised of four business units, as follows:

- TPP "Kostolac" A
- TPP "Kostolac" B
- Open Cast Mine "Drmno" (OCM Drmno)
- Open Cast Mine "Ćirikovac" (OCM Ćirikovac)

2.1. Overview and Status of Permits

Table 40 provides overview of permits and status of permits, licenses and other necessary approvals for year 2021.

Table 40

BRANCH TPP & OCM KOSTOLAC - OPEN CAST MINES			
Overview and status of permits for year 2021			
Business unit	Granted permits and approvals (number and date)	New requests for permits or for existing permits extension	Note
OCM Drmno	Decision of the Ministry of Mining and Energy on use and utilization of transformer station TS 110/6 kV Rudnik 4 and overhead line 110 kV No. 1261 RP 110 Kv Drmno (TPP Kostolac B) - TS 110/6kV Rudnik 4 at Open Cast Mine Drmno, No.310-02-01854/2020-02 dated March 15th, 2021.	-	-

2.2. Monitoring and Environmental Impact

2.2.1. Air Quality Measurements

Air quality measurements in the vicinity of mines and TPP "Kostolac" A and TPP "Kostolac" B are conducted under an integral network of measuring points.

2.2.2. Emission Measurements of Substances Affecting Water Quality

▪ Dewatering System Waters

Water from the OCM "Drmno" dewatering system is mainly transported to the TPP "Kostolac" B cooling water reservoir, while smaller amounts are discharged into the Mlava River. Water from the OCM "Ćirikovac" dewatering system is accumulated in the mine vicinity. OCM "Klenovnik" water amounts are low and therefore not measured.

Drainage water quality control originating from OCM "Drmno" dewatering system in year 2021 was carried out by the authorized legal entity "Institute for Occupational Safety" – Novi Sad. Table 41 shows the drainage water quality results for OCM "Drmno" for year 2021.

Table 41

BRANCH TPP & OCM KOSTOLAC - OPEN CAST MINES			
Drainage water quality in year 2021			
OCM Drmno	Draining well 3 (drainage lake inlet TEKO B)	Draining well 75 (northern section OCM Drmno)	Overflow station – Mlava OCM Drmno
Sulphates (mg/l)	79,21-105,20	8,41-16,03	41,18-100,1
Phenols (mg/l)	0,02-0,024	0,02-0,024	0,02-0,024
Electrical conductivity (µS/cm)	595-997	693-865	613-960
Arsenic (mg/l)	0,01-0,028	0,01-0,016	0,01

▪ Sanitary Water

Water which is used as drinking water and sanitary water at OCM "Drmno", comes from Bradarac water source. Drinking water quality is controlled by the authorized legal entity Požarevac Health Protection.

Table 42 shows data on sanitary wastewater treatment device operation in year 2021.

Table 42

BRANCH TPP & OCM KOSTOLAC - OPEN CAST MINES	
Sanitary wastewater treatment device operation in year 2021	
Pollutant concentration (mg/l)	BIODISC OCM Drmno
Suspended matter (mg/l)	
Deviser inlet	8,4-66,0
Device outlet	26,8-52,8
5 day Biochemical oxygen demand (BOD₅)	
Device inlet	4,0-42,0
Device outlet	5,0-20,0
Device efficiency assessment	Fulfills guarantees for suspended matters for all measuring

In 2021, sampling and testing of water quality was performed by the authorized legal entity on sanitary wastewater treatment plant inlet and outlet on the location of OCM Drmno.

Drinking water used by the OCMs "Cirikovac" and "Klenovnik" comes from the city waterworks system. Water quality is controlled by the authorized legal entity Požarevac Health Protection.

Table 43 provides data of used and sanitary water amount, as well as drainage water amounts for OCM Drmno in year 2021.

Table 43

BRANCH TPP & OCM KOSTOLAC - OPEN CAST MINES				
Water amounts in year 2021 (m ³ /a)				
Open Cast Mine		Dewatering	Sanitary waters for needs of OCM	
		Total water amounts	Water supply	Total amount
Klenovnik		34.128	3.810	37.938
Ćirikovac	Ash disposal site dewatering	158.239	6.386	164.625
	Pit	0		
Drmno	Surface dewatering	6.457.731	135.068	44.633.377
	Deep dewatering	38.040.578		
TOTAL: BRANCH TPP & OCM "KOSTOLAC" – OPEN CAST MINES		44.690.676	145.264	44.835.940

2.2.3. Emission Measurements of Matters Affecting Soil Quality

Pursuant to Land Protection Law ("Official Gazette of RS", No. 112/2015), as well as Regulation on systematic monitoring of state and quality of soil ("Official Gazette of RS", No. 88/2020), soil quality measurement is performed on every five years if not otherwise required by local network pedological profile.

Pursuant to Study on OCM "Drmno" environmental impact assessment, soil quality measurement is planned for year 2022 at 72 measuring points.

▪ Overview of Expropriated and Reclaimed Areas

Overview of expropriated and reclaimed areas in PE EPS Branch TPP-OCM Kostolac for the period until 2020, changes in 2021 and total area up to and including 2021, for locations and types of reclaimed areas are represented in Table 44.

Total expropriated areas amount to 4.334,66 ha.

Land area registered in the cadaster amounts to 316.55 ha.

Land area with changed use has been unchanged related to year 2020 and it amounts to total of 454,32 ha.

Land area containing building structure remained unchanged in relation to year 2020 and it amounts to total of 1,41 ha.

Land area under dump sites remained unchanged in relation to year 2020 and it amounts to total of 859,20.

Reclaimed areas include areas under forests, arable land, orchards and plant nursery.

In year 2021 reclaimed areas under forests were increased for 7,50 ha, and in year 2021 they amount to total of 174,21 ha.

In year 2021 reclaimed areas under arable land were increased for 10,00 ha and in year 2021 they amount to total of 352,80 ha.

Reclaimed areas under orchards remained unchanged in relation to year 2020 and they amount to total of 2,00 ha.

Reclaimed areas under plant nursery remained unchanged in relation to year 2020 and they amount to total of 7,50 ha.

Table 44

KOSTOLAC TPPs & OCMs BRANCH – OPEN CAST MINES																			
Overview of expropriated and reclaimed areas until 2021																			
Open Cast Mine	Expropriated area (ha)	Land area registered in cadaster (ha)		Land area with changed use (ha)		Land area containing building structure (ha)		Dump Site areas (ha)				Reclaimed areas (ha)							
		Until 2020	In 2021	Until 2020	In 2021	Until 2020	In 2021	Inside		Outside		Forests		Arable Land		Orchards		Plant Nursery	
								Until 2020	In 2021	Until 2020	In 2021	Until 2020	In 2021	Until 2020	In 2021	Until 2020	In 2021	Until 2020	In 2021
Klenovnik	472,00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ćirikovac	1.047,00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Drmno	2.646,11	197,50	-	454,32	-	1,41	-	859,20	-	-	-	40,51	7,50	342,80	10,00	2,00	-	7,50	-
Kličevac	169,55	119,05	-	-	-	-	-	-	-	-	-	126,20	-	-	-	-	-	-	-
TOTAL	4.334,66	316,55		454,32		1,41		859,20		0,00		174,21		352,80		2,00		7,50	

2.2.4. Environmental Noise Measurement

Noise measurement was performed in year 2021 at measuring point OCM "Ćirikovac". Acting pursuant to claim of individual from Klenovnik, Republic Inspector, pursuant to Law on Protection Against Noise in the Environment (Official Gazette of RS, No. 36/2009 and 88/2010), Rulebook on Noise Measurement Methods, Contents and Form of Noise Measurement Reports (Official Gazette of RS, No. 72/2010) and the Regulation on Noise Indicators, Limit Values, Methods for Noise Indicators Evaluation, Nuisance and Harmful Effects of Noise in the Environment (Official Gazette of RS, No. 75/2010), per Decision No. 910-480-501-00043/2020-04 dated January 13th, 2021, ordered Branch TPPs-OCMs "Kostolac" to perform noise measurement by authorized person. It is related to noise which occurs due to mining and construction operations at Ash and Slag Disposal Site Ćirikovac, within the area of impact.

On January 21st, 2021, under registered number 0501-35883/1-2021 Branch TPPs-OCMs "Kostolac" submitted to authorized Ministry of Environmental Protection, Department for Monitoring and Precaution environmental measures, Republic Inspector, Application to extend time for acting according to Decision, with explanation that all works regarding embankment construction have been suspended due to adverse weather conditions.

On March 23rd, 2021 under registered number 0501-158152/1-2021, Branch TPPs-OCMs "Kostolac" submitted Report of performed noise measurement, pursuant to Decision No. 910-480-501-00043/2020-04 dated January 13th, 2021.

Measurement was performed on February 24th, 2021 by authorized legal entity MIPHEM, Belgrade, within three time intervals.

Table 45 shows date of measured noise level in environment at measuring point OCM "Ćirikovac".

Table 45

KOSTOLAC TPPs & OCMs BRANCH – OPEN CAST MINES					
Noise level in 2021 (dB)(A) – OCM "Ćirikovac"					
Period of noise measurement	Time of noise measurement	Measured level of residual noise	Measured level of total noise	Calibration of measuring series	Relevant noise level
For day 06-18 h	08:54-10:11 h	30,9 dB(A)	31,4 dB(A)	-0,18 dB	31,4 dB(A)
For night 18-22 h	18:07-19:17 h	29,6 dB(A)	31,2 dB(A)	-0,21 dB	31,2 dB(A)
For night 22-06 h	22:02-22:58 h	26,4 dB(A)	27,7 dB(A)	-0,39 dB	27,7 dB(A)

During noise measurement in environment, it is determined that noise level does not exceed permitted level of external noise for day and night.

Pursuant to Study on OCM "Drmno" environmental impact assessment, it is planned to perform noise measurement for year 2022 at three measuring points:

1. Vidikovac
2. Container complex
3. Road towards Kličevac.

2.2.5. Waste

Table 46 provides amounts of generated waste in year 2021 for Branch TPPs-OCMs "Kostolac" (Branch sections OCM "Drmno" and OCM "Ćirikovac").

Table 47 provides amounts of delivered waste in year 2021 from Branch TPPs-OCMs "Kostolac" (Branch sections OCM "Drmno" and OCM "Ćirikovac").

Table 46

BRANCH TPPs-OCMs KOSTOLAC							
Generated types of waste for year 2021 (t)							
Number	Rulebook on Waste Categories, Testing and Classification ("Official Gazette of RS" No. 56/2010, 93/2019 and 39/2021)	Index number	Organizational unit				Note
	Name		OCM Drmno	OCM Ćirikovac	HW Warehouse	Total	
1	Waste printer cartridges other than the ones indicated under 08 03 17	08 03 18 08 03 99	0,039	0,008	0,000	0,016	-
2	Waste bonds and seals containing organic solvents or other hazardous substances	08 04 09*	0,162	0,000	0,000	0,162	Adhesive
3	Waste mineral non-chlorinated hydraulic oil	13 01 10*	12,070	0,000	0,000	12,070	-
4	Waste synthetic non-chlorinated hydraulic oil	13 01 11*	1,075	0,000	0,000	1,075	-
5	Waste mineral non-chlorinated gearbox and lubrication oils	13 02 05*	13,200	0,000	0,000	13,200	-
6	Other fuels (including mixtures)	13 07 03*	0,820	0,000	0,000	0,000	-
7	Other emulsions	13 08 02*	1,860	0,000	0,000	1,860	-
8	Packaging containing residues of hazardous substances or contaminated by hazardous substances	15 01 10*	0,970	0,000	0,000	0,970	Metal packaging – oil and grease tanks
9	Absorbents, filter materials (including oil filters which are not otherwise specified), wiping clothes, protective clothing, contaminated by hazardous substances	15 02 02*	1,995	0,000	0,000	1,995	Cotton cloth
			0,250	0,000	0,000	0,250	Absorbent
10	Absorbents, filter materials, wiping clothes and protective clothing other than those indicated under 15 02 02	15 02 03	0,050	0,000	0,000	0,050	Air filter
			0,000	0,001	0,000	0,001	Protective equipment – PPE footwear
11	Waste tyres	16 01 03	7,211	0,000	0,000	7,211	Car tyres
12	Discarded vehicles not containing liquids nor other hazardous components	16 01 06	1,500	0,000	0,000	1,500	-
13	Oil filters	16 01 07*	2,400	0,000	0,000	2,400	-
14	Lead batteries	16 06 01*	5,402	0,000	0,000	5,402	Accumulator batteries
15	Ceramics	17 01 06*	0,080	0,000	0,000	0,080	-
16	Glass	17 02 02	4,696	0,000	0,000	4,696	-
17	Plastics	17 02 03	0,290	0,000	0,000	0,290	-
18	Copper, bronze, brass	17 04 01	0,500	0,000	0,000	0,500	-
19	Aluminum	17 04 02	1,480	0,000	0,000	1,480	-
20	Iron and steel	17 04 05	787,205	1,700,029	0,000	2,487,234	Various thickness
21	Cables other than those indicated under 17 04 10	17 04 11	57,551	46,800	0,000	104,351	Copper cables
			0,000	0,000	0,000	0,000	Aluminum cables

BRANCH TPPs-OCMs KOSTOLAC							
Generated types of waste for year 2021 (t)							
Number	Rulebook on Waste Categories, Testing and Classification ("Official Gazette of RS" No. 56/2010, 93/2019 and 39/2021)	Index number	Organizational unit				Note
	Name		OCM Drmno	OCM Ćirikovac	HW Warehouse	Total	
22	Earth and stone containing hazardous substances	17 05 03* 15 02 02*	0,490	0,000	0,000	0,490	Earth and sand soaked with oil
23	Plastics and rubber	19 12 04	0,000	0,000	0,000	0,000	Rubber bands
			95,800	0,000	0,000	95,800	Rubber material
24	Fluorescent tubes and other waste containing mercury	20 01 21*	0,032	0,000	0,000	0,032	Fluo tubes and mercury bulbs
25	Discarded electrical and electronic equipment other than those indicated under 20 01 21 and 20 01 23 containing hazardous components	20 01 35*	2,932	0,000	0,000	2,932	-

Table 47

BRANCH TPPs-OCMs KOSTOLAC							
Amounts of delivered waste in year 2021 (t)							
Number	Rulebook on Categories, Testing and Classification of Waste ("Official Gazette of RS" No. 56/2010, 93/2019 and 39/2021)	Index number	Organizational unit				Note
	Name		OCM Drmno (t)	OCM Ćirikovac (t)	HQ Warehouse (t)	Total (t)	
1	Used wax and grease	12 01 12*	2,600	0,000	0,000	2,600	-
2	Other engine oils. Oils for gearboxes and lubrication	13 02 08*	0,910	0,000	0,000	0,910	Additive for D2
3	Other emulsions	13 08 02*	5,278	0,000	0,000	5,278	-
4	Packaging containing remainings of hazardous substances or contaminated by hazardous substances	15 01 10*	7,700	0,000	0,000	7,700	Metal packaging – oil and grease tanks
5	Absorbents, filter material (including oil filters which are not otherwise specified), wiping cloths, protective clothing, contaminated by hazardous substances	15 02 02*	9,030	0,000	0,000	9,030	Oily wiping cotton cloth
6	Waste tyres	16 01 03	69,950	0,000	0,000	69,950	Car tyres
7	Waste vehicles not containing liquids or other hazardous components	16 01 06	172,250	0,000	0,000	172,250	-
8	Oil filters	16 01 07*	5,992	0,000	0,000	5,992	-



BRANCH TPPs-OCMs KOSTOLAC							
Amounts of delivered waste in year 2021 (t)							
Number	Rulebook on Categories, Testing and Classification of Waste ("Official Gazette of RS" No. 56/2010, 93/2019 and 39/2021)	Index number	Organizational unit				Note
	Name		OCM Drmno (t)	OCM Ćirikovac (t)	HQ Warehouse (t)	Total (t)	
9	Discarded equipment which contains hazardous components other than those stated under 16 02 09 до 16 02 12	16 02 13*	11,100	0,000	0,000	11,100	-
10	Glass	17 02 02 20 01 02	11,500	0,000	0,000	11,500	-
11	Plastics	17 02 03	5,100	0,000	0,000	5,100	-
12	Copper, bronze, brass	17 04 01	0,200	0,000	0,000	0,200	-
13	Aluminum	17 04 02	3,850	0,000	0,000	3,850	-
14	Iron and steel (iron of various thickness)	17 04 05	1.357,100	1.166,97	0,000	2.524,070	Various thickness
15	Cables other than those stated under 17 04 10	17 04 11	0,000	65,050	0,000	65,050	Copper cables
16	Earth and stone which contain hazardous substances	17 05 03* 15 02 02*	2,786	0,000	0,000	2,786	-
17	Plastics and rubber	19 12 04	98,300	0,000	0,000	98,300	Rubber materials
18	Discarded electrical and electronic equipment other than those stated under 20 01 21 and 20 01 23 containing hazardous components	20 01 35*	1,400	0,000	0,000	1,400	-

2.3. Working Environment Monitoring, Occupational Health and Safety

The 2021 Occupational Health and Safety Reports include the following elements:

- **Working environment monitoring**
 - working environment noise measurements
- **Safety**
 - training
 - work injuries
- **Health**

2.3.1. Working Environment Monitoring

- **Working environment noise measurements**

In year 2021 at Drmno OCM and Ćirikovac OCM monitoring was not conducted, i.e. noise measurements were not conducted.

2.3.2. Occupational Safety

- **Employees training**

In Public Enterprise „Electric Power Industry of Serbia“ employees are trained in accordance with the Health and Safety Training Programme and in accordance with the health management system procedures and occupational safety standards ISO 45001. Testing of occupational safety competence and knowledge advancements are implemented at least once a year in accordance with Kostolac TPP-OCM Branch Risk Assessment Act, Law on Mining and Geological Exploration and Occupational Safety and Health Law. Under the Occupational Safety and Health Law, training at Kostolac open cast mines was conducted with every new worker recruitment, deployment to new workplaces, technological process changes and the introduction of new equipment and work tools. Revision and competence testing was conducted for employees working at working positions with increased risk.

Table 48 shows the number of employees envisaged for training, as well as number of employees trained in year 2021.

Table 48

KOSTOLAC TPPs & OCMs BRANCH – OPEN CAST MINES					
Employees training in 2021					
Organizational unit	Number of Employees	To be trained		Trained	
		Number	%	Number	%
OCM "Drmno"	1.475	1.207	81,83	1.207	100,00
OCM "Ćirikovac"	80	41	51,25	41	100,00
HQ	521	110	21,11	110	100,00
TOTAL: BRANCH TPPs-OCMs KOSTOLAC – OPEN CAST MINES	2.076	1.358	65,41	1.358	100,00

Note: Certain employees passed more than one training, e.g. due to transfer to other workplaces, etc.

- **Work injuries**

Table 49 provides data on number of injuries at work in year 2021.

Table 49

BRANCH TPPs-OCMs KOSTOLAC – OPEN CAST MINES						
Occupational injuries in year 2021						
Organizational unit	Number of Employees	Injuries – employees ratio				
		Minor	Severe	Fatal	Total	%
OCM "Drmno"	1.475	6	2	0	8	0,54
OCM "Ćirikovac"	80	0	0	0	0	0,00
HQ	521	0	0	0	0	0,00
TOTAL: BRANCH TPPs-OCMs KOSTOLAC – OPEN CAST MINES	2.076	6	2	0	8	0,39

2.3.3. Health Protection

All employees from the Kostolac open-cast mines are subject to pre-employment and/or periodical medical examinations. Employees to be employed or during transfer to some other work post with high risk are referred to pre-employment medical examinations. Employees working at high-risk posts are referred to periodic medical examinations done once a year. In 2021, periodic medical examinations were done in the Occupational Medicine Clinic within Požarevac Health Center.

Table 50 provides data on periodical medical examinations for examining work capability of employees in year 2021.

Table 50

BRANCH TPPs-OCMs KOSTOLAC – OPEN CAST MINES											
Work capability of employees in 2021											
Organizational unit	Number of Employees	Periodical examinations				Work capability					
		Referred to examination		Examined		Capable		Limited capability		Not capable	
		number	%	number	%	number	%	number	%	number	%
OCM "Drmno"	1.475	1.207	81,83	1.188	98,43	1.055	88,80	117	9,85	16	1,35
OCM "Ćirikovac"	80	41	51,25	38	92,68	27	71,05	11	28,95	0	0,00
HQ	521	110	21,11	109	99,09	106	97,25	3	2,75	0	0,00
TOTAL: BRANCH TPPs-OCMs KOSTOLAC – OPEN CAST MINES	2.076	1.358	65,41	1.335	98,31	1.188	88,99	131	9,81	16	1,20

2.4. Public Submissions

There were no public submissions regarding the environment in year 2021.

3. NIKOLA TESLA THERMAL POWER PLANT BRANCH

Nikola Tesla TPP Branch (TENT Branch) comprises of five organizational units:

- **Nikola Tesla A TPP (TENT A);**
- **Nikola Tesla B TPP (TENT B);**
- **Kolubara A TPP (Kolubara A TPP);**
- **Morava TPP (Morava TPP);**
- **Railway transport (RT).**

3.1. Overview and Status of Permits

Table 51 shows an overview of obtained permits, as well as submitted applications for new permits or extension of existing ones in 2021.

Table 51

NIKOLA TESLA THERMAL POWER PLANT BRANCH			
Overview and status of permits in 2021			
Organizational unit	Obtained permits and approvals (number and date)	New requestes for obtaining or extension of valid permits	Note
TENT A	Consent of the Ministry of Environmental Protection for continuous measurement of emissions from stationary sources of pollution in the Thermal Power Plant Nikola Tesla A on the common stack of units A 1 2 3 for units A1, A2 and A3. Decision no. 353-01-01971 / 2020-03 from 01 st February 2021.	-	-
	Minutes no. 924-480-501-00141/2021-07 dated 29 th December 2021, which did not identify illegalities in the procedure of determining the fulfillment of conditions from regulations in the field of environmental protection, for the purpose of obtaining an energy license for TENT A, unit A1.	-	-
	Minutes no. 924-480-501-00109/2021-07 dated 11 th October 2021, which did not identify illegalities in the procedure of determining the fulfillment of conditions from regulations in the field of environmental protection, for the purpose of obtaining an energy license for TENT A, unit A3 and unit A4.	-	-
	Minutes no. 924-480-501-00110 / 2021-07 from 11 th October 2021, which did not identify illegalities in the procedure of determining the fulfillment of conditions from regulations in the field of environmental protection, for the purpose of obtaining an energy license for TENT A, unit A5 and unit A6.	-	-
	Decision on issuing a water permit no. 325-04-001689 / 2019-07 from 08 th February 2021. A water permit was issued for the abstraction of surface water from the Sava River, the discharge of wastewater into the Sava River (wastewater from the ash landfill is not included) and for the bank fortification on the right bank of the Sava). The validity period of the water permit is until February 8 th 2025.	-	-
TENT B	Minutes no. 924-480-501-00112 / 2021-07 from 15 th October 2021, which did not identify illegalities in the procedure of determining the fulfillment of conditions from regulations in the field of environmental protection, for the purpose of obtaining an energy license for TENT B, unit B1 and unit B2.	-	-
KOLUBARA A TPP	Decision no. 353-02-2286 / 2021-03 dated 29 th October 2021 on approval of the Study on Environmental Impact Assessment of the project "CONSTRUCTION OF AUXILIARY BOILER ROOM AT KOLUBARA TPP, phase I with two hot water boilers on compressed natural gas (CNG)"	-	-

NIKOLA TESLA THERMAL POWER PLANT BRANCH			
Overview and status of permits in 2021			
Organizational unit	Obtained permits and approvals (number and date)	New requestes for obtaining or extension of valid permits	Note
MORAVA TPP	Minutes no. 910-480-501-00060 / 2021-04 from 23.09.2021. which did not determine the illegalities in the procedure of determining the fulfillment of the conditions from the regulations in the field of environmental protection, for the purpose of obtaining an energy license for Morava TPP.	-	-

Study on Environmental Impact Assessment of the project "CONSTRUCTION OF AUXILIARY BOILER ROOM AT KOLUBARA TPP, phase I with two hot water boilers on CNG" was prepared in July 2021. Contractors: DUO BACCO doo Belgrade, 4ENG doxa doo Belgrade and Environmental Engineering Green and naturale environment-GANE Belgrade.

Public discussion and presentation of the study was held on October 15th, 2021 in the premises of the Municipal Administration of Lazarevac. There were no objections to the study at the public hearing.

3.2. Monitoring and Environmental Impact

3.2.1. Air quality monitoring in the vicinity of the TENT Branch organizational units is carried out as part of the monitoring financed and organized by individual organizational units. It should be noted that the air quality monitoring is within the competence of the legislator; therefore, air quality monitoring is carried out as part of the national automatic air quality monitoring network, including measuring points located in the proximity of the TENT Branch.

During 2021, air quality measurements were performed in the proximity of all four organizational units: TENT A, TENT B, Kolubara TPP and Morava TPP. Measurements contractors were Occupational Safety and Environmental Protection Beograd Ltd. and City Institute for Public Health Belgrade, Institute for Occupational Safety Novi Sad and Mining Institute Belgrade. During 2021, some measurements were performed in the vicinity of TENT A and TENT B and internally by the laboratory of the Department for Environmental Control and Protection of TENT, which is not accredited.

TENT A and TENT B

In 2021 in the vicinity of TENT A and TENT B measurements of the total particulate matter content (TPM) were performed by the accredited laboratories at 19 measuring points, sulphur dioxide and soot concentrations were performed at two measuring points, and suspended matter smaller than 10µm (PM₁₀) at one measuring point throughout the year. In accordance with the Environmental Impact Assessment Study of the project for the construction of the ash landfill cassette IV at TENT A, some additional measurements were performed compared to previous years. In order to assess the zero condition, PM₁₀ and PM_{2.5} measurements were performed at two measuring points, the existing one where PM₁₀ measurements are already performed throughout the year in Rojkovac, away from the ash landfill and at the EMS Mladost measuring point, closer to the ash landfill. Measurements of PM_{2.5} at these two measuring points, as well as PM₁₀ at EMS Mladost, in accordance with legal regulations, were performed in a period of eight weeks, evenly distributed throughout the year. Table 52 gives data on the air quality in the vicinity of TENT A and TENT B.

During 2021 there was no significant ash dispersion from ash landfills and no citizens' complaints to air pollution. All existing active cassettes protection systems on TENT A and TENT B ash landfills were in operation, water lens covered an optimal area in accordance with the technical requirements. Moreover, wetting of dry surfaces was also executed.

Kolubara A TPP

Air quality measurements in the Kolubara A TPP surroundings have been performed for over twenty years. Monthly and annual air quality monitoring reports for the vicinity of Kolubara A TPP are submitted to the local self-government authorities and governmental agencies, at their request. During 2021, TPM content was measured at 8 measuring points, and concentration of SO₂, soot and total suspended particles PM₁₀ was measured at 1 measuring point. Measurements were performed in the period from 1st January 2021 until 29th December 2021.

Morava TPP

Air quality monitoring in the vicinity of Morava TPP started on 1st January 2021 by measuring the TPM content at 8 measuring points, and concentration of SO₂, soot and total suspended particles PM₁₀ at 1 measuring point.

During 2021, ash was dispersed from ash landfills to a much lesser extent because the system for ash wetting was installed at one inactive cassette VII, which was in operation during the summer period, especially when there were strong winds. Water lens at an inactive cassette VII covered an optimal area in accordance with the technical requirements.

Table 52 shows air quality data analysis for 2021 in terms of conformity with the legal requirements for the plants of TENT Branch. Air quality assessment was performed based on the measuring results compared to the limit and tolerable values for SO₂, TPM, total suspended matter PM₁₀ and soot, specified by the Regulation stipulating air quality monitoring conditions and requirements (Official Gazette of RS, no. 11/10, 75/10 and 63/13). The regulation is compliant with the European Union Regulation.

Table 52

NIKOLA TESLA THERMAL POWER PLANT BRANCH					
Air quality in 2021					
Legal compliance (data or days exceeding legal limits)					
Air quality indicators	Total particulate matters levels - TPM (mg/m ² /day)		Concentration of SO ₂ (µg/m ³)		
	Maximum permissible value (MPV)		LV	TV	TL
Averaging period					
One hour			350	350	0
*One day			125	-	
**One month	450		-		
***Calendar year	200		50	-	
TENT A and TENT B	*	-	No exceedance out of a total of 730 data. Measurements performed on two measuring points		
	**	Measurements were performed at 18 measuring points, as follows: - 2 measuring points, TENT A landfill area; - 3 measuring points, TENT B landfill area; - 4 measuring points in the vicinity of TENT A; - 5 measuring points in the vicinity of TENT B; - 4 measuring points in Obrenovac and its vicinity; - 1 measuring point in Vladimirci. Out of a total of 215 data items for monthly TPM values, there were five exceedances of TPM, which is 2,79% – three exceedances in the vicinity of TENT A, one at TENT B landfill area, one in the vicinity of TENT B and one in Vladimirci.	-		
	***	Out of a total of 19 metering points there were two exceedances of TPM for mean annual TPM value – one in the vicinity of TENT A and one at TENT B landfill area	No exceedance		
KOLUBARA A TPP	*	-	No LV exceedance out of a total of 351 data items. The measurement is performed at one measuring point		
	**	Measurements were performed at 8 measuring points from 01 st January 2021 until 29 th December 2021, therefrom: At MP2 village Sokolovo, household of a natural person, in July 2021 exceedance was	No exceedance		

		468.20 mg/m²/dan , on other measuring points there was no exceedance of MPV.			
	***	For the measured period from 01 st January 2021 until 29 th December 2021, there were exceedances of the MPV at the measuring points MP8 Kolubara TPP 50 meters from the chemical water treatment plant (255.61 mg/m²/dan)			No exceedance
MORAVA TPP	*	-			No exceedance
	**	Measurements were performed at 8 measuring points, as follows: - 2 measuring points at TEM ash landfill ; - 1 measuring point in the vicinity of oil landfill; - 4 measuring points in Svilajnac; - 1 measuring point in the village of Crkvenac; Of the total number of data for monthly values of total suspended solids, MM4 exceeded the MPV in one sample and MM5 exceeded the MPV in four samples.			No exceedance
	***	For the measuring period from 01 st January 2021 until 31 st December 2021 there was exceedance at one measuring point MM4 in November, on MM5 there was exceedance of MPV in April, May, November and December, while at the other six measuring points there was no exceedance of the MPV.			No exceedance
Air quality indicators		Total suspended matters PM₁₀ (µg/m³)			Soot (µg/m³)
Averaging period		LV	TV	TL	Maximum permissible concentration (MPC)
*One day		50	50	0	50
***Calendar year		40	40	0	50
TENT A and TENT B	*	Number of data exceeding LV was 95 which is 22,5% out of 421 data items. Measurements were performed at one measuring point during all 365 days of the year (Rojkovac), and at another measuring point during eight weeks of the year (EMS Mladost).	-	-	No exceedance out of a total of 730 data items. Measurement were taken at two measuring points
	**	-	-	-	-
	***	LV exceeded at measuring point Rojkovac (40,9µg/m ³), and no exceedance at EMS Mladost (38,0µg/m ³)	-	-	No exceedance
KOLUBARA A TPP	*	Number of data exceeding LV was 95 (in January 14, in February 21, in March 18, in October 12, in November 14), which is 26.91% (based on 353 data items). Measurement was performed daily at one measuring point on a daily basis.	-	-	No LV exceedance out of a total of 351 data items. The measurement is performed at one measuring point

		Exceedance more than 35 times per one calendar year.			
	**				
	***	Above LV – 41.7 $\mu\text{g}/\text{m}^3$ (based on 353 data items, which is 96.71% data items for the subject year)	-	-	No exceedance
MORAVA TPP	*	Number of data exceeding LV was 68 (in January - 7, in February - 19, in March - 16, in June - 3, in July - 1, in September - 3, in October - 4, in November - 9, December - 6).	-	-	No exceedance
	**	-			-
	***	No exceedance			No exceedance
Air quality indicators		Total suspended matters $\text{PM}_{2.5}$ ($\mu\text{g}/\text{m}^3$)			
Averaging period		LV	TV	TL	
*** Calendar year		25	30	0	

LV – Limit value, TV – Tolerance value, TL – Tolerance limit

Note: hourly values are not measured for sulphur dioxide

The concentration of benzopyrene and heavy metals (Pb, Cd, Ni, As Cr^{6+}) from suspended PM_{10} particles was also measured within the monitoring of air quality in the vicinity of TENT A and TENT B at the measuring points Rojkovac and EMS Mladost. The average annual concentrations of heavy metals at both measuring points did not exceed the limit or target value. The target value for the average annual concentration for benzopyrene at the measuring point Rojkovac was exceeded, while at the measuring point EMS Mladost it was not exceeded.

Based on the long-term air quality monitoring in this area, the following may be concluded:

- SO_2 concentrations are below the prescribed average daily and annual mean limit values and tolerance values;
- Air pollution by ash particles PM_{10} and $\text{PM}_{2.5}$ is of local significance, mainly the result of power plant operation and other sources of pollution (traffic, household furnaces and the like). Pollution is higher during winter months.

3.2.1. Emission Measurements of Matters Affecting Air Quality

Total sulphur content in Kolubara lignite supplied to the TENT Branches is approximately 0.5%. Flue gases containing sulphur dioxide, nitrogen oxides, carbon dioxide and dust, after treatment and dust separation by electrostatic precipitators, are emitted into the air through stacks of the following heights:

- TENT A - 150m (units A1, A2 and A3) and 220m (units A4, A5 and A6)
- TENT B - 280m (units B1 and B2)
- Kolubara A TPP - 105m (boiler K1), 105m (boilers K3, K4 and K5) and 130m (unit A5, K6);
- Morava TPP - 105m.

In line with the legal requirements individual pollutants air emission measurements are carried out regularly, while continuous measurements are carried out on the majority of the TENT Branch units.

▪ **Periodic emission measurements of matters affecting air quality**

During 2020, periodic emission measurements of matters affecting air quality were conducted once a year at TENT A units – units A3, A4, A5 and A6; at unit A1, A2 and A3 stacks, at Kolubara A TPP at the stack 2 (boilers K3, K4 and K5) and at stack 3 (unit A5, K6), and twice a year at stack 1 (boiler K1) at Kolubara TPP. In Morava TPP there were two individual measurements of air emission affecting the air quality. Both measurements were conducted on the stack, as stack measuring point was aligned with the standard in the meantime. Monitoring Programme content included the flue gas condition measurements (temperature, pressure and humidity), flow rate, oxygen content, mass concentrations and emission factors for sulphur dioxide (SO₂), nitrogen oxides (NO_x - NO₂), carbon monoxide (CO), chlorine (HCl) and fluorine (HF) compounds and dust. Furthermore, technical and elementary coal analysis was conducted. In addition to this, macro-elements, combustible substances and particle size distribution measurements were also conducted. Emission measurements of matters affecting air quality were performed by accredited laboratories of the Nuclear Science Institute Vinča and Mining Institute - Belgrade, in line with the „Air Pollutants Emission Periodic Measuring Plan”.

Table 53 shows the results of periodic emission measurements of air pollutants affecting air quality for the TENT Branch, performed during 2021.

Table 53

NIKOLA TESLA THERMAL POWER PLANT BRANCH								
Periodic emission measurements of matters affecting air quality in 2021								
Mass concentrations of matters affecting air quality (mg/Nm ³)								
Organizational part	TENT A						TENT B	
Unit	A1	A2	A3	A4	A5	A6	B1	B2
Power MWth	660	660	932	943	934	934	1.809	1.826
SO ₂ -unit			3.289	4.561	4.135	2.104		
SO ₂ -stack	1.408							
NO _x (NO ₂) -unit			478	373	248	389		
NO _x (NO ₂) -stack	249			235	194	377		
CO -unit			42	52	67	82		
CO- димњак	88							
Particulate matter - unit			37	41	31	35		
Particulate matter - stack	100							
Organizational unit	KOLUBARA A TPP						Morava TPP	
Unit, boiler	K1		K3,K4 and K5			A5,K6		
Power MWth	125,6		376,8			333,5	420,0	
SO ₂	3.553,6		2746,1			4426,7	5.058,6	
	3.218,5						5.130,2	
NO _x (NO ₂)	284,3		180,5			495,1	527,1	
	325,0						569,9	
CO	38,1		22,0			17,3	16,1	
	44,1						36,1	
Particulate matter	895,4		353,1			63,1	25,8	
	784,2						41,2	

Note: Pursuant to the Directive on the limitation of emissions of certain pollutants into the air from large combustion plants (Off. Gazette of RS, no. 6/16, 67/21), Article 5 stipulates that old large combustion plants do not have to comply with individual ELVs if from the date of entry into force of the abovementioned Directive they are included in the preliminary application for the National Emission Reduction Plan from big stationary combustion plants. TENT A and TENT B are included by National Emission Reduction Plan.

Likewise, in accordance with Article 6 of this Directive, authorized body can exclude huge combustion plants from implementation of limit values of pollutant air emissions and from obligation determined by National Emission Reduction Plan of old combustion plants on condition that these were in exemption mechanism due to its limited life. TEM and TEK are included in this mechanism due to the limited life of the plant.

On units A3, A5 and A4 in TENT A and unit B1 in TENT B, burners were reconstructed in order to reduce nitrogen oxide emissions and increase unit capacity.

▪ **Continuous emissions measurements of matters affecting air quality**

In the period from 2004 until the end of 2014, equipment for continuous emissions measurements of matters affecting air quality was installed on TENT Branch units. In addition to the basic equipment for measuring mass concentration of dust and gases, some additional measuring equipment was installed for oxygen (O₂), carbon dioxide (CO₂) and humidity, as well as temperature (t), pressure (p) and flue gases flow rate. Data acquisition and processing equipment was also installed.

The project funded through an IPA donation included design, supply, delivery, installation, commissioning, calibration - QAL2 certification of the continuous measuring system for sulphur dioxide (SO₂), nitrogen oxides (NO_x - NO₂), carbon monoxide (CO), carbon dioxide (CO₂), dust for:

- all units (A1-A6) in Nikola Tesla A TPP (completion of existing equipment),
- units B1 and B2 Nikola Tesla B TPP and
- unit A5 - Kolubara A TPP.

CEMS Reports were established in line with the Large Combustion Plants Directive 2001/80/EC and in accordance with the legislation in the Republic of Serbia. The entire system was reconciled with EN 14181 (QAL1, QAL2 and QAL3) standard and national legislation. Pursuant to the Air Protection Act (Official Gazette of RS No. 36/09, 10/13 and 26/21) and the Rulebook on conditions for giving approval to operators for air quality measurements and/or emissions from stationary pollution sources (Official Gazette of RS No. 16/12), TENT A, TENT B, MTPP and KTPP boilers K3, K4 and K5 and unit A5 obtained approvals for continuous emission measurements from stationary pollution sources.

Table 54 shows the overview of results for continuous emission measurements of matters affecting air quality (mean annual mass concentration) for TENT Branch in 2021.

Table 54

NIKOLA TESLA THERMAL POWER PLANT BRANCH								
Continuous emission measurements of matters affecting air quality in 2021								
Mass concentrations of matters affecting air quality (mg/Nm ³)								
Organizational unit	TENT A						TENT B	
	A1	A2	A3	A4	A5	A6	B1	B2
Power MWth	660	660	932	943	934	934	1.809	1.826
SO ₂	2.216			2.888	2.589	2.658	2.242	2.581
NO _x (NO ₂)	306			347	372	412	361	304
CO	105			79	92	121	50	40
Particulate matter	106			24	27	40	37	39
Organizational unit	Kolubara A TPP*							Morava TPP
	K1		K3, K4 and K5			A5, K6		
Power MWth	125,6		376,8			333,5		420,0
SO ₂	-		4.338,4			3.816,0		3.602
NO _x (NO ₂)	-		240,1			434,0		426
CO	-		254,0			62,0		34
Particulate matter	-		1001,0			119,3*		**

Note: In accordance with Article 38 paragraph 2 and Appendix 3 paragraph 1.2 of the Regulation prescribing air emission measurements from stationary sources of pollution there is not obligation of continuous emission measurements for plants with heating power of 100 MWth to 300 MWth with remaining plant life cycle less than 10,000 operating hours. Boiler K1 does not have equipment for continuous emission measurement of air pollutants. In December 2020, a condition was met for exclusion from the obligation of continuous emissions measurement of air pollutants from boiler plant of the boiler K1 in Kolubara TPP, since the remaining service life of the plan was less than 10,000 operating hours. Namely, the boiler K1 in Kolubara TPP is an old large combustion plant at the final list of plants and, since 1 January 2018 has been using exemption due to limited life cycle (the so called "opt out" mechanism – 20,000 operating hours until 31 December 2023).

* Due to the malfunction of continuous measurement of particulate matter on unit A5, K6 of TPP Kolubara in October, November and December 2021, the correction of the average annual mass concentration of particulate matter for 2021 was corrected by excluding monthly values for October, November and December 2021.

** Defective device for continuous measurement of particulate matter emissions throughout the year 2021 in TPP Morava.

Table 55 shows data on equipment in units for continuous emission measurement of matters affecting air quality in TENT Branch organizational units.

Table 55

NIKOLA TESLA THERMAL POWER PLANT BRANCH									
Equipment in TPP units for continuous measurement of matters affecting air quality in 2021									
		Emitted matter			Parameters				
Organizational unit	Particulate matter (PM)	Gases		Content			p	T	Flow
		SO ₂ , NO _x (NO ₂), CO	HCl and HF	Humidity	CO ₂	O ₂			
TENT	A1	Measuring devices installed on each unit on flue ducts after the left and right ESP, behind flue gas fan (FGF) and on the stack of units A1, A2, A3. Total: 13 devices.	One measuring device installed per unit and on the stack of units A1, A2, A3. Sampling is carried out on flue ducts, continuously, behind the left and right FGF. Flue gas is mixed and led to measuring devices for gases. Total: 7 sets of measuring devices.	-	Humidity measurement installed on stack of units A1, A2, A3. Humidity adopted for units A4, A5 and A6.	Total: 7 measuring devices.			Measuring devices installed on each unit, on flue ducts after the left and right ESP, flue gas fan, as well as stack of units A1, A2, A3. Total: 13 sets of measuring devices.
	A2								
	A3								
	A4								
	A5								
	A6								
TENT B	B1	Measuring device installed on the flue duct, at the elevation 55.1 m in the inner stack lining.	-	Measuring device installed on the flue duct, at the level 55.1m in the inner stack lining.					
		Platform located at the elevation 54m, inner stack lining. Total: 1 set of measuring devices							
	B2	Measuring device installed on the flue duct, at the elevation 55.1m in the inner stack lining.		Measuring devices installed on the flue duct, at the level 55.1m in the inner stack lining.					
		Platform located at the elevation 54m, inner stack lining. Total: 1 set of measuring devices							
KOLUBARA A TPP	K1	-	-	-					
	K3	Measuring devices (except HC and HF devices) installed at the elevation of 46.25m, outer stack lining.							
	K4	Platform is located at the elevation of 45m, outer stack lining. Control measurements openings at the elevation of 46.75m. Stack height - 105m.							
	A5-K6	Installed: • behind ESP after FGF: Left ESP Right ESP • stack	Installed on the stack	-	Installed on the stack	Installed: • behind ESP after FGF: Left ESP Right ESP • stack	Installed on the stack		
		Measuring devices installed at the elevation of 51m, outer stack lining. Platform is located at the elevation of 50m, outer stack lining. Measuring plane with measuring opening for control measurements located at the elevation of 51.5m. Stack height - 130m.							
MORAVA TPP	At the measuring section of the stack three measuring platforms were located (50,3m 50,7m and 56,7m). In the measuring platform MP1 at the elevation 50.3m there are openings for AMS. Measuring devices for pressure, gases and dust on the outer side of the stack lining. Measuring platform MP2 at 50.7m have openings for CPM. MP3 is located at 56.7m. Inlet part of the platform is at 46.7m and the outer is at 48.3m. Platform is at the elevation 49m. Stack height is 105m.								

Data acquisition and processing equipment (software) is an integral part of the above automatic measuring system (AMS). Under the Decisions issued by the competent ministries, i.e.: 2nd December 2013 Ministry of Energy, Development and Environment, 22nd December 2014, and 16th

January 2017 Ministry of Agriculture and Environment, and 25th November 2019 the Ministry of Environmental Protection, TENT was granted Approval for independent continuous stationary pollutant sources measurements for the following pollutants: SO₂, NO_x, CO and total particulate matter for TENT A units A1 to A6, TENT B units B1 to B2 and Kolubara A TPP unit A5, Approval of 1st February 2021 for TENT A on the common stack of units A 123 for units A1, A2 and A3.

The abovementioned devices for boilers K3, K4, K5 at Kolubara A TPP were installed on joint stack 2 (105m high), at the elevation of 46.25m. The first calibration of devices - QAL2 tests of basic and additional equipment were conducted in November 2014 by the accredited laboratory AEROLAB d.o.o. Beograd. Under Decisions issued by the competent ministries, i.e. on November 30th, 2015 by the Ministry of Agriculture and Environment, on 11th October 2017 and August 21st, 2020 by the Ministry of Environmental Protection, TENT was granted approval for continuous measurement of pollutant emissions from stationary pollution sources for boilers K3, K4, K5 - Kolubara TPP“.

Equipment for the continuous emissions measurements of air pollutants at the Morava TPP was installed on the stack in 2018. The equipment is in operation and was calibrated under QAL-2. In 2019, the Ministry's Approval was obtained for continuous measurement of pollutant emissions from stationary pollution sources. Calibration of the device for measuring gases was performed during 2021, while the device for measuring the emission of particulate matter was defective.

Annual emissions of matters affecting air quality

Table 56 provides an overview of air emissions affecting the air quality: dust, SO₂, NO₂ and CO₂ for TENT Branch in 2021. Annual dust, SO₂ and NO₂ emissions were calculated on the basis of mean annual flow rates, mean annual concentration of pollutants obtained from continuous measurements and periodic emission measurements, and operating periods during stable operation (h) of each unit (stack), according to CEMS (there might be correctios regarding emission calculation method).

On the stack D1 (boiler K1) of "Kolubara" TPP there is no equipment for continuous measurement of emissions of substances that affect air quality. For boiler K1, the quantities of emitted substances that affect the quality are calculated by multiplication, based on the results of occasional measurements of the legal entity, operating hours during normal operation of the plant (h) with output volume flow of substances (Nm³ / h) and average measured mass concentrations (mg (Nm³)) obtained from occasional measurements of pollutant emissions in 2021.

Table 56

NIKOLA TESLA THERMAL POWER PLANT BRANCH				
Emissions of matters affecting air quality in 2021 (t/year)				
Organizational unit	Particulate matter	SO₂	NO_x (NO₂)	CO₂
TPP NIKOLA TESLA A				
A1-A2-A3	1.805,01	37.734,95	5.210,69	4.383.881
A4-A5-A6	711,27	66.314,27	8.890,90	6.583.295
Total: TENT A	2.516,28	104.049,22	14.101,59	10.967.176
TPP NIKOLA TESLA B				
Total: TENT B	970,53	63.862,23	8.122,20	6.497.795
Kolubara A TPP				
K1	730,67	2.944,55	263,95	169.800
K3, K4 and K5	1.476,32	6.398,46	354,11	195.952
A5, K6	408,54	13.067,73	1.486,21	575.372
Total: KOLUBARA A TPP	2.615,53	22.410,74	2.104,27	941.124
Morava TPP				
Total: MORAVA TPP	53,5	8.174,6	879,5	376.929
TOTAL: NIKOLA TESLA THERMAL POWER PLANT BRANCH	6.155,84	198.496,79	25.207,56	18.783.024

Calculation for CO₂ was made on the basis of data on fuel consumption, shown in Table 57 and CEF - emission correction factor.

Table 57

NIKOLA TESLA THERMAL POWER PLANT BRANCH								
Fuel consumption in 2021								
Org. unit	TENT A		TENT B		KOLUBARA A TPP		MORAVA TPP	Branch Total
Raw material	Unit	(t/year)	Unit		Boiler	(t/year)	(t/year)	(t/year)
COAL	A1	1.389.706	B1	2.858.473	K1	247.776	435.659	27.096.774
	A2	1.711.635	B2	6.616.097	K2	-		
	A3	3.132.910			K3	21.909		
	A4	3.445.379			K4	120.063		
	A5	2.958.248			K5	148.723		
	A6	3.142.262			K6	867.934		
	TOTAL	15.780.140		9.474.570		1.406.405	435.659	
HEAVY FUEL OIL	A1	16.743	B1	9.302	K1	-	1.012	81.644
	A2	12.816	B2	21.776	K2	-		
	A3	6.264			K3	-		
	A4	4.214			K4	-		
	A5	4.694			K5	-		
	A6	4.823			K6	-		
		TOTAL	49.554		31.078		-	
OIL	A1	-	B1	-	K1	1.200	882	6.482
	A2	-	B2	-	K2	-		
	A3	-			K3	285		
	A4	-			K4	719		
	A5	-			K5	789		
	A6	-			K6	2.607		
		TOTAL	-		-		5.600	

• **Harmonisation of emissions of matters affecting air quality with European Union regulations**

Particulate matter

In 2014, the electrostatic precipitator of unit A3 was reconstructed. This means that the electrostatic precipitators of all units in TPP "Nikola Tesla" A (A1, A2, A3, A4, A5 and A6) and in TPP "Nikola Tesla" B (B1 and B2), as well as unit A5 in TPP "Kolubara" have been reconstructed. "A. Supplier's guarantee for mass concentrations of particulate matter at the outlet of the electrostatic precipitator is $\leq 50\text{mg}/\text{Nm}^3$, which is in accordance with the requirements of EU and Republic of Serbia regulations.

Electrostatic precipitator of Morava TPP was reconstructed in order to achieve the output dust concentration of $50\text{ mg}/\text{Nm}^3$, during the 2016 overhaul. Individual measurements of matters affecting air quality carried out in July and August 2021 confirmed an outlet dust mass concentration within the values guaranteed by the equipment supplier.

Sulphur dioxide

During the designing and construction of Nikola Tesla A and B TPPs, no sulphur oxides emissions reduction measures were undertaken. To reduce sulphur oxide emissions below $200\text{mg}/\text{Nm}^3$ in line with the Serbian and EU legislation, flue gas desulphurization plants should be introduced in the forthcoming period.

In 2011, the Japanese Government approved a loan to introduce the flue gas desulphurisation system at the Nikola Tesla TPPs. Following the tender procedure, a consortium led by Mitsubishi Hitachi Power Systems was selected as the contractor in September 2017. The contract signed with the contractor has been valid since November 2017. Completion date related to construction of Flue Gas Desulphurization Plant will be 21st May 2022 plus 12 months' guarantee period, as per the latest information.

During 2018, in addition to numerous activities, a New General Regulation Plan for TENT A was developed and adopted by the competent authorities in June 2018. Public discussion and presentation of the Assessment Study on environmental impact of FGD plants construction in TPP "TENT A" units A3-A6 were conducted in November 2018. After obtaining the approval for the Study

from the Ministry for Environmental Protection in 2019, the conditions for building permit acquisition were fulfilled. During 2019, within the Flue Gas Desulphurization Project in A3-A6 Nikola Tesla thermal power plant, the following was realized: building permit for relocation of underground installations at the complete FGD area (both phases) was obtained, building permit for phase 1 (system for limestone receiving and gypsum storing) was obtained, as well as the building permit for preparation works in phase 2 (obtained on 18th January 2020).

During 2021, work continued on both phases. At the end of 2021, the realization of completed works is 74.5%.

Nitrogen oxides

In the previous period, primary measures have been introduced on units A3, A4 and A5 TENT A. During major overhaul of unit B1 primary measures have been introduced, and guarantee tests will be conducted in year 2022. The plan is to introduce primary nitrogen oxide reduction measures in the coming period on unit A6 TENT A, as well as on TENT B units B2.

3.2.2. Emission Measurements of Matters Affecting Water Quality

Water used for condenser vapour cooling has the highest share in the total amount of technical water used by PE EPS Nikola Tesla Branch TPPs. River water is captured, used to cool condensers and subsequently discharged via the return tunnel back into the recipient. TENT A and TENT B use the Sava River water for cooling, while the Morava TPP uses the Morava River water, and those three thermal power plants have an open cooling system. Kolubara A TPP uses the Kolubara River water and it has a closed cooling system with towers.

Approximately 2.5% of captured water is used for thin slurry (ash and slag) transport in TENT A, while 0.9% of captured water was used in 2021 in TENT B for thin slurry transport and wetting of the landfill.

Wastewater originating from the thin slurry transportation system is discharged directly or indirectly into the recipient in the form of overflow and drainage water, in old technology of hydraulic transport of "thin" ash water ratio (1:10) in TENT A and Kolubara A TPP. Drainage and overflow waters in TPP Morava are returned by pumps to the system for ash and slag transport.

In the case of the thick slurry transport (ash/water ratio - 1:1) used by TENT B there is no overflow and discharge of drainage water into the recipient, but water is stored in the winter and used for disposal site wetting in the summer.

Demineralized water (demi water) used in boilers and the water-vapour system is produced by a chemical water treatment plant. Demi water is produced by chemical treatment of groundwater in ion exchangers. In Kolubara A TPP demi water is obtained by treating decarbonised water in ion exchangers - columns. Raw water is captured from tube wells located along the riverbank. HCl or NaOH solution is used to regenerate ion masses, resulting in acid and alkaline wastewater used for ash and slag transport.

Sanitary wastewater after mechanical-biological treatment under aerobic conditions (TENT A and TENT B) is discharged directly or indirectly into the river. The equipment for sanitary wastewater treatment Biodisk, in TENT A has a UV lamp for water disinfection before it is released into the Sava. At the Morava TPP, sanitary water is discharged into the city sewer network.

Water containing oil and/or fuel oil, after oil or fuel oil removal from the water surface by means of adsorption agents indirectly via storm drainage or a return cooling water tunnel, is discharged back into the recipient (TENT B, TEK and TEM).

Waste water treatment plant was constructed and commissioned at TENT A in 2016, and it consists of several units:

- atmospheric water from the concrete surfaces and roofs of the administrative building, the maintenance building, the turbine hall and the rolling stock, as well as other facilities at site runs through the main collector, and from the concrete surfaces and roofs of the RT buildings, warehouse and the external rolling stock runs through the secondary collector and flow into the return cooling water channel. Atmospheric water and other wastewater from the coal

landfill, (water from wagons defrosting, washing of inclined bridges and conveyor belts, from bulldozer depots) after purification at the wastewater treatment plant (G1), are discharged into the old drainage channel of the ash landfill, where atmospheric waste water from water landfill after passing the separator is also discharged,

- waste waters from drainage pit of heavy oil station, condensate expander and drainage pits of heavy oil heating stations, after treatment at the plant for pretreatment of heavy oil waste waters (UM1), are taken to the oily waste water treatment plant (U1),
- except the heavy oil contaminated waste waters which were pretreated on API- separator (UM1), waste waters from machine hall drainage pits are treated at U1 plant as well and then discharged into the old ash landfill drainage channel.
- plant for treatment of waste waters resulting from the flue gas desulphurization process (FGD) is not in operation at this time because the construction of FGD plant is still underway.

Control of waste water in the facilities of TENT Branch and its impact on recipients and groundwater is done 4 times a year, except for the return cooling water at TENT A and TENT B and the water at the oil separator outlet at TENT A waste disposal, which are analyzed once a month. Tests are carried out by authorized legal person.

The program of control of each organizational part of the TENT Branch includes the physical and chemical, bacteriological and radiological parameters that are given as necessary for monitoring the compliance with the legal regulations related to certain types of water.

Control program includes the following types of water:

- Waste waters at discharging points into the river;
- River waters – recipients' waters on the profiles upstream and downstream of the waste water discharge point;
- - Groundwater in the vicinity of ash and slag landfill (piezometers and rural wells).

Within the control program, monitoring of the efficiency of devices for wastewater treatment is also carried out at TENT A - G1, UM1 and Biodisk. Ash and slag landfills groundwater quality impact is monitored by testing water quality in the piezometers and rural wells located in the landfill vicinity. Long-term studies have shown that concentrations of sulphate and arsenic are relevant parameters to monitor the impact of ash and slag landfills on groundwater. Sulphate ion, originating from the landfill is characterised by the fastest migration and is considered to be an excellent tracer for monitoring of the landfill groundwater impact. There is groundwater control in piezometers in vicinity of coal storage and waste storage in TENT A.

TENT B recorded the current state, so-called "zero state", of groundwater quality prior to the commencement of ash landfill site exploitation. Groundwater quality data, "zero state", are of great importance for further monitoring and evaluation of the ash landfill impact on the groundwater quality. In TENT B, PUTOKS plant for sanitary waste water treatment is monitored in terms of its operational efficiency.

Annual surface and groundwater quality reports for each TENT unit are submitted by authorized person to Serbian Environmental Protection Agency, The Ministry of Environmental Protection and the Public Water Management Company, also to the competent inspectors upon their request, as well as to the relevant institutions during the opinion obtaining process for the purpose of issuance of water permits.

Results of water quality measurements are presented in the Environmental Report developed each year for every organisational unit. Additionally, data are presented in the National Pollution Sources Registry delivered by PE EPS TENT Branch each year to the Environmental Protection Agency in line with the legal regulations. Surface, groundwater and wastewater quality control for 2021 at all four locations of TENT was executed by authorized legal entity, the Institute for occupational protection Novi Sad. Table 58 shows the analysis of wastewater and recipient quality data for 2021 in terms of their legal compliance.

In case of surface waters, legal compliance was evaluated by comparing the measured values of parameters with the limit values defined by the Regulation stipulating limit values for pollutants in surface and ground waters and sediments, and due dates for their achievement (Official Gazette of

RS No. 50/2012), while wastewater values were compared with the limit values defined by the Regulation stipulating limit values of pollutants in water and due dates for their achievement (Official Gazette of RS No. 67/2011, 48/2012 and 1/2016).

Table 58

NIKOLA TESLA TPPs BRANCH				
Water quality in 2021				
Organizational unit	TENT A	TENT B	KOLUBARA A TPP	MORAVA TPP
Water type	Waste water and recipients			
Drainage wastewater from the landfill	<ul style="list-style-type: none"> ▪ suspended solids: <1 – 40 mg/l, one LV exceedance - 35 mg/l in old drainage channel ▪arsenic: <0,004 - 43 µg/l, two LV exceedances of 10µg/l in samples of new drainage channel ▪sulphates: 33 - 522 mg/l Below LV -2.000 mg/l ▪fluorides: <0,5 -2,73 mg/l, LV exceedances -2mg/l in new drainage channel 	<ul style="list-style-type: none"> ▪ suspended solids <1 – 13 mg/l, ▪arsenic: 50 - 76 µg/l, ▪sulphates: 763-891 mg/l ▪fluorides: <1,39 - 1,71 mg/l Not discharged into recipient. 	-	Not discharged into recipient
Overflow wastewater from the landfill	<ul style="list-style-type: none"> ▪ suspended solids: <1 – 76 mg/l, one LV exceedance ▪arsenic: 102 – 313 µg/l. Above LV-10µg/l ▪sulphates: 401 – 455 mg/l, below LV-2.000mg/l ▪fluorides: 3,02 -3,68 mg/l, LV exceedances-2mg/l in all three samples Note: analysed sample is a mixture of overflow and drainage waters with mostly overflow waters 	<ul style="list-style-type: none"> ▪ suspended solids. <1 – 4,4 mg/l, ▪arsenic: 110 - 352 µg/l, ▪sulphates: 383-520 mg/l ▪fluorides: <1,07 - 1,65 mg/l Not discharged into recipient. 	<p>suspended solids: 12-48 mg/l (I batch of sampling is above the reference value of 48 mg/l) RV 35 mg/l for suspended solids</p> <p>arsenic: 0.211-3.80 mg/l (all three batches of sampling are above the reference value of 0.01 mg/l)</p> <p>sulphates: 338.9-579.8 mg/l (all three batches below the reference value of 2000 mg/l)</p> <p>fluorides: <0.5-4.02 mg/l (III batch of sampling is above the reference value of 4.02 mg/l) RV for fluorides 2 mg/l</p>	Not discharged into recipient
Recipient	<p>No changes of the Sava River quality upstream - downstream of TENT A for:</p> <ul style="list-style-type: none"> ▪arsenic: not exceeding LV -10µg/l ▪sulphates: up to 30 mg/l, below LV-100 mg/l 	<p>No changes of the Sava River quality upstream - downstream of TENT B for:</p> <ul style="list-style-type: none"> ▪arsenic: not exceeding LV - 10µg/l ▪sulphates: up to 25 mg/l, below LV-100 mg/l 	<p>Turija River:</p> <ul style="list-style-type: none"> -arsenic: upstream values are below the reference value 0.010 mg/l (in all three samples <0.004 mg/l) downstream are two samples (II and III batch) above the reference values 	<p>Velika Morava River upstream wastewater discharge:</p> <ul style="list-style-type: none"> Total N 4,46 mg/l (III quarter) Ammonium ion 0,775 mgN/l (III quarter) Oxygen saturation 99,6% (IV quarter) <p>Velika Morava River downstream</p>

NIKOLA TESLA TPPs BRANCH				
Water quality in 2021				
Organizational unit	TENT A	TENT B	KOLUBARA A TPP	MORAVA TPP
Water type	Waste water and recipients			
	<ul style="list-style-type: none"> ▪ mineral oil: not identified. Sava River temperature differences (TENT A upstream and downstream) is less than 3°C (in accordance with legal regulations) and it averages 1,7°C. In the third quarter, the Sava downstream from TENT A was the third class for the nitrite nitrogen parameter, compared to the Sava upstream. 	<ul style="list-style-type: none"> ▪ mineral oil: not identified. Sava River temperature differences (TENT B upstream and downstream) is less than 3°C (in accordance with legal regulations) and it averages 2,3°C In the second quarter, the Sava downstream from TENT A was the third class for the iron parameter, compared to the Sava upstream. 	<p>0.010 mg/l (0,126 and 0.370 mg/)</p> <ul style="list-style-type: none"> ▪ sulphates: upstream values are below the reference value in I and III sampling batch (100 mg/l), whereas in II batch the values are above RV (117.2 mg/l) Two samples downstream (II and III batches of sampling) are above the reference value of 100 mg/l (163.8 and 237.5 mg/l) Kolubara River: - arsenic: upstream values are below the reference value 0.010 mg/l (in all three samples <0.004 mg/l) downstream one sample (III batch) is above the reference value (0,065 mg/l) RV (0,010 mg/l) -sulphates: upstream and downstream all samples are below reference value (100 mg/l) -Mineral oils: upstream in III batches of sampling <0,01mg/l, in II batch of sampling 0.123 mg/ and in I batch 0.050 mg/l, downstream I batch 0.153 mg/l, II batch 0.294mg/l, III batch 0.022 mg/l Reference values are not given. - Kolubara River temperature difference upstream and downstream from TEK is lower than 3°C in all three batches of sampling 	<p>wastewater discharge:</p> <p>Total N 3,14-4,32 mg/l (III, IV quarter)</p> <p>Ammonium ion 0,757 mgN/l (III quarter)</p> <p>Oxygen saturation 95,9 % (IV квартал)</p> <p>Velika Morava River during discharge of wastewater from sand filters washing:</p> <p>Total N 2,99-4,46 mg/l (III, IV quarter)</p> <p>Ammonium 0,373-0,706 mgN/l (III, IV quarter)</p> <p>Nitrites 0,064-0,094 mg/l (III, IV quarter)</p> <p>Oxygen saturation 95,9 % (IV quarter)</p> <p>Return cooling water at discharge of the Velika Morava River:</p> <p>Total inorganic nitrogen 5,21 mg/l (IV quarter)</p>

Table 59 shows the analysis of groundwater quality data in the vicinity of ash and slag landfills for 2021 in terms of compliance with legal requirements. The analysis is given for some of the examined parameters that are of greater importance.

During 2021 groundwater quality monitoring in TENT A was conducted in 13 piezometers (they are, in addition to the vicinity of ash landfill, located within TENT A area, near MPB, next to the coal landfill and in the waste storage) and 3 rural wells, TENT B – 7 piezometers (they are, in addition to the vicinity of ash landfill, located in the waste storage) and 4 rural wells, TPP KOLUBARA A - 4 piezometers and 4 rural wells and TPP Morava 1 piezometer and 4 rural wells.

Legal compliance is evaluated by comparing the groundwater values measured in piezometers with remediation values of pollutant, hazardous and harmful substances in aquifer in line with the Regulation on limit values of pollutant, hazardous and harmful substances in soil (Official Gazette of RS No. 30/2018, 64/19), while the rural wells water data are compared with the maximum permissible concentrations (MPCs) stipulated by the Rulebook on hygienic correctness of drinking water (Official Gazette of FRY No. 42/98 and 44/99 and Official Gazette of RS, No. 28/19).

Table 59

NIKOLA TESLA TPPs BRANCH						
Groundwater quality around ash and slag landfills in 2021						
	Permissible values		Organisational unit			
	*	**	TENT A	TENT B	KOLUBARA TPP A	MORAVA TPP
Sulphates (mg/l)	250		Highest in piezometers: P7-3, P2 and Ps 1 (from 208 mg/l – 446 mg/l). Below MPC in all samples of rural wells.	Highest in piezometers: P2 and P48: 440 mg/l - 779 mg/l Below MPC in all samples of rural wells.	In wells: ▪ N1 and N3 below the reference value ▪ N2, 534.4-557.4 mg/l, in II and III batch of sampling of the reference value 250 mg/l; in I batch of sampling not sampled ▪ N4, 684.1-819.0 mg/l, in II,III batches of sampling above RV. In I batch of sampling below RV. In piezometers: ▪ I-2, 81.5-489.3mg/l; ▪ VIII-1, 604.1-701.7 mg/l; ▪ XV-1, 57.96-573.2 mg/l; ▪ B2, 487.6-507.7 mg/l; no reference value for piezometers (Regulation on limit values of pollutant, hazardous and harmful substances in soil (Official Gazette of RS No. 30/2018 and 64/2019)	In controlled piezometer 300,2-321 mg/l. Above MPC in the well of hydrant water 341,6-360 mg/l. Above MPC in rural well Crkvenac 273 mg/l

NIKOLA TESLA TPPs BRANCH						
Groundwater quality around ash and slag landfills in 2021						
	Permissible values		Organisational unit			
	*	**	TENT A	TENT B	KOLUBARA TPP A	MORAVA TPP
Arsenic (µg/l)	10	60	Below MPC in all samples of piezometers Above MPC in one sample of well in Urovci – 0,018 mg/l	Below MPC in all samples of piezometers Below MPC in all rural wells.	In wells: ▪ N1, N2 and N4 below reference value 0.010 mg/l ▪ N3, in II sampling 0,037 mg/l is above reference value, in the remaining two samples is below RV; In piezometers: ▪ I-2, 0.252-0.416 mg/l, in all samples above reference value 0.060 mg/l; ▪ VIII-1, 0.107-0.178 mg/l in all samples above reference value 0.060 mg/l;	In controlled piezometer <0,01 mg/l. In the well for hydrant water <0,01 - 0,017 mg/l. Above MPC in rural well Crkvenac 0,029 mg/l. (I quarter)
Lead and cadmium (mg/l)	Pb 0,01	Pb 0,075 Cd 0,006	Lead above MPC in two samples of piezometer P1/4 (0,481 и 0,236 mg/l), in one sample of piezometer P4/2 (0,213 mg/l) and one sample of piezometer P19 (0,096 mg/l) Below MPC in all rural wells Cadmium above MPC in one sample of piezometer P1/4 (0,0098 mg/l).	Lead above MPC in one sample of piezometer P48 (Pb – 0,433 mg/l). Cadmium below MPC in all piezometers Lead below MPC in all rural wells	▪ XV-1, 0.042-0.060 mg/l, in I and III (0.042 mg/l) below reference value in II batch is at the limit of reference value 0.060 mg/l; ▪ B2, < 0.01- 0.015 mg/l, in all samples below reference value 0.060 mg/l; In wells N1, N2, N3 and N4 Pb is below reference value 0.01 mg/l in all samples. In piezometers, Cd is below reference value 0.006 mg/l in all samples. Pb in piezometers: ▪ I-2, < 0.01– 0.012 mg/l below reference value 0.075 mg/l; ▪ VIII-1, < 0.01-0.015 mg/l, in I batch of sampling at the limit of reference value 0.075 mg/l; ▪ XV-1, < 0.01– 0.048 mg/l, below reference value; ▪ B2, in all three samples <0.01mg/l, below reference value	In controlled piezometer below MPC. Below MPC in all wells.

NIKOLA TESLA TPPs BRANCH						
Groundwater quality around ash and slag landfills in 2021						
	Permissible values		Organisational unit			
	*	**	TENT A	TENT B	KOLUBARA TPP A	MORAVA TPP
Zinc (mg/l)	3,0	0,8	Above MPC in most samples of piezometers (up to 237 mg/l) Below MPC in all samples of rural wells	Above MPC in piezometers P59, P48 and P35 (1,7 – 8,0 mg/l)	In wells Zn below reference value 3.0 mg/l in all samples. In piezometers Zn is below reference value 0.800 mg/l, in all samples except for piezometers VIII-1 in I and III batch of sampling (2.50 mg/l and 1.52 mg/l)	In controlled piezometer below MPC. Below MPC in all wells.
Manganese (mg/l)	0,05		Above MPC in two samples of rural well- 12,37 mg/l and 0,249 mg/l	Above MPC in one sample of well in Usce (0.362 mg/l)	In wells: N1 – 0.118- 0.239 mg/l in all three batches of sampling above reference value 0.05 mg/l.	In controlled piezometer 0,106- 0,130mg/l. Above MPC in 1 well (Topoljar) measured 0,554-0,866 mg/l
Ammonia (mg/l)	0,03		Ammonia is above MPC in one sample of well 1 in Krtinska– 2,17 mg/l.	Ammonia is above MPC in all samples of rural wells.	N2 – 0.919 – 3.41 mg/l, in II and III batch of sampling above reference value. I batch not sampled N3 – 0.147 mg/l – 0.639 mg/l in all three batches of sampling above reference values. N4 - <0.004 -0.011 mg/l below reference value in all samples. Ammonia below reference value 0.5 mg/l in wells N1 and N4, whereas in well N2 in II and III batch of sampling above reference value (0.71 -5.09 mg/l) I batch not sampled and in well N3 in all three batches of sampling above reference 3.24 mg/l; 3.48 mg/ l and 4.10 mg/ l. There is no reference value for ammonia for piezometers (Regulation released in Official Gazette of the Republic of Serbia No. 30/2018 and 64/2019	In controlled piezometer below MPC. Above MPC in 1 well (hydrant water) measured 2,03-2,43 mg/l. (II, III, IV quarter) Above MPC in well Topoljar 0,6 mg/l. (III quarter)

NIKOLA TESLA TPPs BRANCH						
Groundwater quality around ash and slag landfills in 2021						
	Permissible values		Organisational unit			
	*	**	TENT A	TENT B	KOLUBARA TPP A	MORAVA TPP
Nitrites (mg/l)	0,1		Nitrites are above MPC registered in one sample of well 2 in Krtinska – 1,11 mg/l.	Nitrites are above MPC registered in one sample of well in Dren (0.139 mg/l) and one sample of well 1 in Grabovac (1.01 mg/l)	Nitrites are below MPC in wells N1 and N4, in well N2 in II batch of sampling above reference values 0.03 mg/l (0.271 mg/l) I batch of sampling sample is not taken, in III batch of sampling it is below reference value and in well N3 in I batch of sampling above reference value 0.03 mg/l (0.031 mg/l). Nitrites were not tested for piezometers.	Above MPC in well Topoljar 0,031 mg/l. (III quarter) Above MPC in well of hydrant water measured 0,238 mg/l. (IV quarter)
Nitrates (mg/l)	50		Nitrates above MPC registered in two samples of well in Urovci – 122 mg/l and 75 mg/l and one sample of well 2 in Krtinska- 284 mg/l.	Above MPC in one sample of well in Dren (59,6 mg/l)	Below reference value 50 mg/l in all samples taken from wells. There is no reference value for nitrates for piezometers (Regulation released in Official Gazette of the Republic of Serbia No. 30/2018 and 64/2019-second regulation)	In controlled piezometer below MPC. Below MPC in all wells.

*MPC potable water;

** Remediation values of concentration of hazardous and harmful substances and values indicating serious groundwater contamination.

As the concentration of manganese in the overflow and drainage waters of ash landfill is low, increased manganese concentration in rural wells water is probably caused by the high level of this element in soil. Apart from this, sometimes concentrations of nitrates in rural wells' water are increased as well as microbiological failures around the TENT B ash landfill, established by the "zero state" testing.

Annual reports of authorized persons from the previous years state that measured high concentration of zinc in piezometers in TENT A and TENT B is the result of dissolution of metal from galvanized pipes the piezometers are made of.

Microbiological analysis of rural wells water indicated the presence of coliform bacteria. This is caused by the proximity of septic tanks and stables, which is concluded based on the data on „zero state“.

Table 60 provides the analysis of sanitary wastewater quality data at the treatment plant inlet and outlet for 2021.

Table 60

NIKOLA TESLA TPPs BRANCH			
Sanitary wastewater treatment plant operation in 2021			
Pollutants concentration (mg/l)	MPC (mg/l)	Biodisk plant TENT A	Putoks plant TENT B
Suspended solids (mg/l)			
Plant inlet	-	12 – 60	19,2 - 181
Plant outlet	75	2,8 - 26	28 - 93
Biological oxygen demand for 5 days (BOD5)			
Plant inlet	-	6 - 13	40 - 180
Plant outlet	50	3,2 - 4	25 - 102

- **Water amounts**

Table 61 provides an overview of water amounts captured and discharged by TENT Branch organisational units for 2021. TENT A and TENT B calculation of annual amounts of captured surface waters and discharged return cooling water, as well as discharged overflow and drainage waters in TENT A is prepared based on the data on capacity and operating time of the pumps for capturing i.e. discharging water. In TENT A and TENT B, there are flow meters both for captured underground and discharged sanitary waste water. In the case of gravitational wastewater discharges, calculations were made based on previous wastewater measurements (overflow and drainage waters from the ash and slag landfill). Veliki Crljeni potable water treatment plant supplies Veliki Crljeni and Kolubara A TPP with potable water. A gauge was installed for the line running towards the Kolubara A TPP, also supplying one part of the settlement and the sports centre.

Table 61

NIKOLA TESLA TPPs BRANCH						
Water amounts in 2021 (m³ / year x10³)						
Organizational unit	Reservoir		Discharged wastewater			
	Used amounts		Return cooling water	Wastewater discharged into Bare Channel	Overflow and drainage water – ash disposal site	Sanitary wastewater
	Surface	*groundwater				
Nikola Tesla A TPP	1.288.283	1.021,3	1.256.621	-	31.738,6	153,8 ¹⁾
Nikola Tesla B TPP	904.473	438,8	869.248	-	-	43,7
Kolubara A TPP	4.459	-	-	590	196	404
Morava TPP	40.774	85	39.291	-	-	6,9
TOTAL: NIKOLA TESLA TPP BRANCH	2.237.989	1.545,1	2.165.160	590	31.934,6	608,4

* For raw water preparation

¹⁾ For sanitary waste water in TENT A we do not have data on cumulative flow, therefore the quantity of water captured from Obrenovac water supply is taken as the amount of discharged sanitary water.

- **Improvements aimed at reducing wastewater impacts on surface and groundwater**

In order to harmonize with the Law on Waters ("Official Gazette of RS", No. 30/10, 93/12, 101/16, 95/18 and 95/18 – second law) and the Decree on limit values for the emission of pollutants in waters and deadlines for their achievement ("Official Gazette of RS", No. 67/11, 48/12 and 1/2016) measures to reduce emissions into water have been implemented or they are planned.

TENT A

TENT A wastewater treatment plant consisting of several parts has been operating since 2016 and it includes treatment plants for coal contaminated waste waters (G1), oil contaminated waste waters (U1) including pre-treatment of heavy oil contaminated waste waters (UM1) and FGD wastewaters (that is not operating since FGD plant has not been built yet). Accredited laboratory of Institute for operational protection Novi Sad performed quarterly samplings (II, III и IV quarter) in 2021 in order to monitor operational efficiency of the plant. In all three quarters, there were no ELV exceedances at the U1 plant outlet. At the outlet of the UM1 plant, the concentration of suspended solids in the sample from the third quarter was increased. Plant G1 did not work with satisfactory efficiency, so in the second and third quarter there was an increased concentration of suspended solids at the outlet of the plant, while in the fourth quarter no sample was taken because the plant was not in operation for a long time

TENT B

Detail Design for the TENT B Wastewater Treatment Plant Construction is under preparation.

3.2.3. Emission Measurements of Matters Affecting Soil Quality

During 2021 the testing of soil quality and the content of total and available forms of heavy metals and pollutants in soil was continued. Reports on soil monitoring for each of the PE EPS

organisational unit are made available to the inspection upon request. Soil quality measurement results are presented in an Environmental Report prepared annually for each organisational unit.

During 2021, one sampling and testing of soil were performed by a legal entity authorized to monitor the soil - Operational and Environmental Protection Belgrade Ltd. at locations TENT A, TENT B, TPP "Kolubara" and TPP "Morava". The following analyses were performed on the samples: mechanical soil composition, soil acidity (active acidity pH in H₂O, substitution acidity pH in 1M KCl), CaCO₃ content, capacity of exchangeable cations Na⁺, K⁺, Ca²⁺, Mg²⁺, degree of base saturation, organic matter content, physical properties of soil: dry soil density; solid phase density and total porosity; accessible water; water permeability rate, structure and hardness, chemical properties of soil: hydrolytic acidity of soil, accessible macroelements (N, P, K, Ca, Mg), total nitrogen and sulfur, electrical conductivity of soil extract, nitrate and nitrite content, total and accessible heavy metals (Cr, Ni, Pb, Cu, Zn, Cd, Hg, B, As and Fe), potentially toxic elements, hydrocarbons of petroleum origin (C₆ – C₄₀), polycyclic aromatic hydrocarbons (PAU).

The soil monitoring program includes field and laboratory measurements at representative measuring points entered on the topographic map (places determined by GPS), which will enable monitoring of changes in the examined parameters at the same measuring points in the coming period.

The number and arrangement of measuring points are defined in accordance with Annex 2 of the Rulebook on the list of activities that may be the cause of soil pollution and degradation, procedure, data content, deadlines and other requirements for land monitoring (Official Gazette of RS, No. 68/19). In particular, the following were taken into account: places where soil or groundwater pollution is known to have occurred, places for storage of raw materials, chemicals or waste, places in the immediate vicinity of the plant where the production process takes place, places where loading takes place and unloading of chemicals and / or waste, warehouses for new and worn out equipment that can be a source of soil pollution, space for servicing and maintenance of machines, space for washing equipment, places near underground septic tanks, tanks and pipelines, areas outside the factory may be affected by factory activities.

The content of heavy metals and other toxic elements in the soil was in the usual concentrations and below the remediation values for: chromium (Cr), lead (Pb), copper (Cu), zinc (Zn), cadmium (Cd), mercury (Hg), arsenic (As) and boron (B). In two samples (1 in TPP Kolubara and 1 in TPP Morava) the nickel concentration exceeds the remediation values prescribed by the applicable legislation.

The evaluation of data was performed in accordance with the Rulebook on the list of activities that can cause pollution and degradation of land, the procedure and content of data, deadlines and other requirements for land monitoring (Official Gazette of RS No. 102/2020) and the Regulation on Limit Values of polluting, harmful and dangerous substances in soil (Official Gazette of RS, No. 30/2018, 64/2019), Annex 1, Limit maximum and remediation values of polluting, harmful and dangerous substances in soil.

TENT A and B

The disposal of ash in TENT A is done by evenly discharging the mixture of water and ash into the accumulation space (active cassette), while the remaining space is temporarily still (passive cassette). Even disposal of ash is achieved by changing the outlets on the active cassette, as well as switching from one cassette to another, every 1 to 2 years (transition period). The landfill covers a total area of 400 ha. The entire surface is made in 3 cassettes. The disposal of ash and slag was performed on cassette II from December 2020 to December 2021, when it was switched to cassette III, which was passive until then.

The total area of the TENT B landfill is 600 ha, of which ash and slag have been disposed of so far on 400 ha. The technology of collecting, transporting and disposing of ash was changed from rare to condensed ash / water mixture (on October 4th, 2009, block B2 was connected to the new system, while block B1 was connected on May 30th, 2010). Cassette II is currently active and Cassette I is passive.

At the location of TENT A and TENT B, analyzes of soil samples from 30 measuring points were performed. The surface layer on the profile from 0 to 30 cm was sampled.

TPP „Kolubara“

At the location of TPP "Kolubara", analyzes of 17 soil samples were performed. The surface layer on the profile from 0 to 30 cm was sampled at all 17 measuring points.

TPP „Morava“

Retention of ash and slag is achieved by building peripheral embankments. There are a total of eight tubs (cassettes), of which I, II, III, IV, V and VI are biologically recultivated (by sowing grass, fruit and other plants), part of cassette VI is a loan point from which ash is exploited for cement, and cassettes VI and VIII are active and serve for the disposal of ash and slag. In 2014, a system of overflow basins was created in which drainage water is collected from the ash and slag landfill, and then the pump system is returned to the excavator station for the re-transport of ash and slag.

At the location of TPP "Morava", analyzes of ash from the landfill and 17 soil samples were performed.

In Table 62, the evaluation of measurement results was performed in accordance with the above-mentioned legal regulations.

Table 62

NIKOLA TESLA TPP BRANCH				
Content of substances affecting the soil quality around TPP in 2021				
Content (mg/kg)	TENT A	TENT B	TPP Kolubara	TPP Morava
Chromium (Cr)	Out of 30 samples, none exceeds LV. None exceeds RV.	Out of 30 samples, 1 exceeds LV. None exceeds RV .	Out of 17 samples, 3 exceed LV. None exceeds RV .	Out of 17 samples, 7 exceed LV. None exceeds RV
Nickel (Ni)	Out of 30 samples, all 30 exceed LV. None exceeds RV .	Out of 30 samples, all 30 exceed LV. None exceeds RV .	Out of 17 samples, all 17 exceed LV. None exceeds RV .	Out of 17 samples, all 17 exceed LV. 1 exceeds RV
Lead (Pb)	Out of 30 samples, none exceeds LV. None exceeds RV .	Out of 30 samples, none exceeds LV. None exceeds RV.	Out of 17 samples, 2 exceed LV. None exceeds RV .	Out of 17 samples, 8 exceed LV. None exceeds RV
Copper (Cu)	Out of 30 samples, 6 exceed LV. None exceeds RV .	Out of 30 samples, 3 exceed LV. None exceeds RV .	Out of 17 samples, 11 exceed LV. None exceeds RV .	Out of 17 samples, 7 exceed LV. None exceeds RV
Zinc (Zn)	Out of 30 samples, 3 exceed LV. None exceeds RV .	Out of 30 samples, 3 exceed LV. None exceeds RV .	Out of 17 samples, 4 exceed LV. None exceeds RV .	Out of 17 samples, 7 exceed LV. None exceeds RV
Cadmium (Cd)	Out of 30 samples, none exceeds LV. None exceeds RV.	Out of 30 samples, 8 exceed LV. None exceeds RV .	Out of 17 samples, 4 exceed LV. None exceeds RV .	Out of 17 samples, 13 exceed LV. None exceeds RV
Mercury (Hg)	Out of 30 samples, 27 exceed LV. None exceeds RV .	Out of 30 samples, 6 exceed LV. None exceeds RV .	Out of 17 samples, all 17 exceed LV. None exceeds RV .	Out of 17 samples, 2 exceed LV. None exceeds RV

3.2.4. Environmental Noise Measurement

During 2021, noise measurements in the environment were performed in the facilities of the TENT Branch, by the Institute for Safety and Security at Work from Novi Sad. Noise level was measured at four measuring points in the vicinity of each plant. According to the order of the inspection, at the locations TENT A and TENT B, noise was measured in the nearest residential zones. Two measurements were performed on TENT A, TENT B and TEM, one of which was 15-minute, with two measurement intervals in the daytime, one in the evening and two in the night mode, while the other measurement was 24-hour. One 15-minute measurement was performed at TEK. In Table 63, the values for day and night measurements are given as the mean values of the two fifteen-minute measurements. Measurements were performed in accordance with the standards SRPS ISO 1996-1 and SRPS ISO 1996-2. The ultimate goal of the measurement is to determine the relevant noise level, which is given over the measured equivalent levels.

Annual reports on environmental noise control for each TENT facility shall be made available to the competent authorities as necessary. The results of measuring the noise level in the environment are presented in the report - State of the environment for the corresponding year for each organizational unit.

Noise in the process of electricity production in thermal power plants is caused by the operation of the following plants: mills, turbines, flue gas fans and occasionally in case of disturbance of the operating mode of the unit (boiler) there is noise from the inclusion of safety valves that lasts up to 1 minute.

At the time of measuring and drafting the reports of the Local Self-Government of the Municipalities of Obrenovac, Lazarevac (City of Belgrade) and Svilajnac, they have not yet performed acoustic zoning in accordance with the Law on Environmental Noise Protection, Official Gazette of RS, No. 96/2021). Due to the lack of clearly limited acoustic zones, it is not possible to precisely determine the measuring points, which should be located on the border of zone 5 - City center, craft, trade, administrative zone with apartments, zone along highways, state and city roads and 6 - Industrial , warehouses and service areas and transport terminals without residential buildings. The measurement results do not exceed the maximum allowable values (ELV) of 65 decibels for the day and 55 decibels for the night period, bearing in mind that the local government unit did not perform acoustic zoning.

The measuring points selected as the nearest residential zone to the TENT B facility are located next to the main road, so a large share in the sum of noise sources is traffic noise.

Measurement of noise levels in the vicinity of the TPP Kolubara plant was performed on March 16/17, 2021 in the conditions of operation of the largest possible number of boilers - K1, K4, K5 and K6. It was not possible to operate the K3 boiler at the time of the noise measurement due to the limited number of available functional cooling towers on the I and II phases of the cooler. The measurement and measurement report are in accordance with applicable regulations and standards. At the time of measurement and preparation of the report, there were no data on acoustic zoning in the vicinity of TPP Kolubara. All measured values are below the limit values for the assumed zone 6. Industrial, storage and service areas and transport terminals without residential buildings. Table 63 shows the data of measured noise levels for 2021 for the plants of the TENT Branch.

Table 63

NIKOLA TESLA TPPs BRANCH					
Noise levels in 2021 (dB)(A)					
Noise indicators limit values, Regulation stipulating noise indicators, limit values, methods assessing noise indicators, disturbance levels and harmful living environment noise effects (OG RS № 75/10)	*Closed area			Day and evening	Night
				35	30
	Open areas	Areas for rest and recreation, hospital zones and rehabilitation centres, cultural and historical sites, large parks		50	40
		Tourist areas, camps and school zones		50	45
		Purely residential areas		55	45
		Commercial-residential areas, trading-residential areas and children's playgrounds		60	50
		City centre, trading, crafts, administrative zones containing flats, zones along motorways, state and city roads		65	55
	Industrial, storage and service areas and transport terminals without residential buildings		At the border of this zone noise must not exceed the limit value in the zone with which it is bounded.		
Measuring points	TENT A	TENT B	KOLUBARA A TPP	MORAVA TPP	
Day 15 min	1	61,9	72,6	58,0	51,5
	2	55,2	69,6	62,7	60,5
	3	63,0	61,8	54,7	58,8
	4	53,0	61,7	63,8	55,1
Evening 15 min	1	62,8	65,7	57,3	52,3
	2	53,2	64,1	58,9	60,4
	3	56,9	57,1	53,4	58,1

	4	58,5	57,2	61,2	54,8
Night 15 min	1	60,0	57,5	53,4	51,5
	2	47,6	61,3	53,9	60,7
	3	52,9	55,5	51,9	57,3
	4	55,1	53,9	54,3	54,8
Measuring points		TENT A	TENT B	KOLUBARA A TPP	MORAVA TPP
24-hour measurement (total noise level)	1	64,6	61,5		57,9
	2	59,4	66,5		66,2
	3	62,0	66,1		61,6
	4	55,1	69,7		62,5

Preparation of Study for noise decrease in the environment for TPP and CHPP is planned in the future period.

3.2.6. Waste

Waste created in 2021 is shown in Table 64, while waste quantities given to the authorized operators in 2021 are shown in Table 65.

Table 64

NIKOLA TESLA TPPs BRANCH									
Generated waste in 2021									
No.	Rulebook on Waste Categories, Testing and Classification ("Official Gazette of RS", no. 56/2010, 93/2019 and 39/2021)		Unit	Organizational unit				Total	Note
	Name	Index no.		TPP Nikola Tesla A	TPP Nikola Tesla B	TPP Kolubara A	TPP Morava		
12	Metal packaging	15 01 04	t	0,060	0,000	0,000	0,000	0,060	Metal packaging
				0,900	0,000	0,000	0,000	0,900	Waste bottles from fire extinguishers
13	Packaging with residue of hazardous substances or contaminated with hazardous substances	15 01 10*	t	0,000	0,000	0,000	0,000	0,000	Waste packaging with a high content of fuel oil
			t	0,000	0,120	0,000	0,000	0,120	Waste contaminated glass packaging
			t	3,327	1,952	0,370	0,000	5,649	Waste contaminated PVC packaging from chemicals
			t	2,015	0,000	0,000	0,000	2,015	Waste metal packaging from oils and lubricants
14	Metal packaging containing dangerous solid porous matrix (e.g., asbestos), including empty bottles under pressure	15 01 11*	t	0,000	0,000	0,000	0,000	0,000	Waste gas bottles
15	Absorbent, filter materials, wiping cloths, protective clothing contaminated by hazardous substances	15 02 02*	t	0,000	2,400	0,315	0,540	3,255	Cotton waste with oil and fuel oil
			t	0,420	0,058	0,004	0,060	0,542	Waste oily filters
			t	10,020	0,480	1,400	0,000	11,900	Waste adsorbents with oil and fuel oil
16	Waste sand	15 02 03	t	0,000	0,000	0,000	0,000	0,000	Waste sand
	Absorbent, filter materials, wiping cloths, protective clothing different from those mentioned in 15 02 02		t	0,000	0,000	0,000	0,000	0,000	Waste non-hazardous filters
17	Waste tires	16 01 03	t	4,880	1,546	0,000	0,180	6,606	Waste pneumatic tires
			t	61,550	32,000	0,400	0,040	93,990	Waste rubber conveyor belt
18	Waste vehicles not containing liquids or other hazardous components	16 01 06	t	0,000	0,000	0,000	0,000	0,000	Waste vehicles that do not contain liquids
19	Waste devices with mercury	16 02 13*	t	0,000	0,000	0,000	0,000	0,000	Waste devices with mercury
	Discarded equipment containing hazardous components other than those indicated under 16 02 09 and 16 02 12		t	6,320	2,116	1,740	0,390	10,566	Waste from electric and electronic devices
20	Lead batteries	16 06 01*	t	5,220	0,000	0,378	3,700	9,298	Waste lead batteries
21	Nickel-cadmium batteries	16 06 02*	t	0,740	0,000	0,000	0,000	0,740	Ni - Cd batteries
22	Waste containing oil	16 07 08*	t	0,000	0,000	0,000	16,520	16,520	Waste from washing liquid fuel tanks
23	Tile and ceramics	17 01 03	t	0,720	0,000	0,120	0,000	0,840	Waste ceramics



NIKOLA TESLA TPPs BRANCH									
Generated waste in 2021									
No.	Rulebook on Waste Categories, Testing and Classification ("Official Gazette of RS", no. 56/2010, 93/2019 and 39/2021)		Unit	Organizational unit				Total	Note
				TPP Nikola Tesla A	TPP Nikola Tesla B	TPP Kolubara A	TPP Morava		
	Name	Index no.		Amounts					
24	Wood	17 02 01	t	5,020	0,000	5,600	0,000	10,620	Waste wood
25	Glass	17 02 02	t	1,020	0,000	0,000	0,000	1,020	Glass waste
26	Plastic	17 02 03	t	1,095	0,400	2,800	0,000	4,295	Waste mixed plastic
27	Glass, plastic and wood containing hazardous substances or contaminated with hazardous substances	17 02 04*	t	0,000	0,000	0,000	0,000	0,000	Waste railway sleepers
28	Copper, bronze, brass	17 04 01	t	2,004	0,040	1,850	0,000	3,894	Copper and brass waste and scrap
			t	1,436	2,200	0,040	0,100	3,776	Waste copper cables
			t	0,000	0,000	0,000	0,000	0,000	Waste brass tubes
			t	19,720	0,000	0,000	0,000	19,720	Waste copper transformer windings
			t	0,155	0,000	0,000	0,000	0,155	Waste bronze
29	Aluminium	17 04 02	t	1,860	0,000	0,760	0,000	2,620	Waste aluminium cables
			t	5,990	1,085	0,000	0,000	7,075	Aluminium - miscellaneous
			t	0,000	0,000	0,000	0,180	0,180	Aluminium sheet metal
			t	0,000	0,000	0,100	0,000	0,100	Waste steel sheet metal
30	Iron and steel	17 04 05	t	2,070	71,430	9,100	0,000	82,600	Waste galvanized and black sheet metal
			t	0,000	0,000	0,000	0,900	0,900	Waste iron with admixtures of other substances
			t	0,000	6,220	0,000	0,000	6,220	Waste Fe combs
			t	178,160	186,000	47,660	34,940	446,760	Waste impact plates
			t	0,000	0,000	0,000	0,000	0,000	Waste steam pipeline
			t	3,400	0,000	0,000	1,140	4,540	Waste boiler tubes
			t	33,760	267,230	1,320	4,280	306,590	Waste iron up to 5mm thick
			t	0,000	0,000	98,840	0,040	98,880	Waste grey casting
			t	0,000	0,000	1,200	0,000	1,200	Waste steel casting
			t	72,730	21,154	0,270	0,000	94,154	Iron and steel waste and scrap
			t	791,010	369,404	98,010	19,700	1.278,124	Waste iron thicker than 5 mm
			t	0,000	0,000	0,000	0,300	0,300	Metal veneer
			t	6,600	0,000	0,000	0,000	6,600	Railway accessories
			t	1,660	0,000	0,000	0,000	1,660	Waste railway tracks
			t	0,000	0,000	0,000	0,940	0,940	Waste metals from magnetic separator
			t	0,000	0,000	0,000	3,860	3,860	Waste steel rolls



NIKOLA TESLA TPPs BRANCH									
Generated waste in 2021									
No.	Rulebook on Waste Categories, Testing and Classification ("Official Gazette of RS", no. 56/2010, 93/2019 and 39/2021)		Unit	Organizational unit				Total	Note
				TPP Nikola Tesla A	TPP Nikola Tesla B	TPP Kolubara A	TPP Morava		
	Name	Index no.		Amounts					
31	Mixed metals	17 04 07	t	0,685	16,780	0,060	0,000	17,525	Waste mixed metals
			t	0,000	1,600	0,000	0,020	1,620	Waste metal veneer
			t	0,000	0,000	0,000	0,000	0,000	Waste mixed metal with ceramic admixtures
			t	0,000	0,000	2,860	0,000	2,860	Valves
			t	0,000	0,000	0,000	0,000	0,000	Waste mixed metals from magnetic separator
32	Metal waste contaminated with hazardous substances	17 04 09*	t	0,000	0,000	0,000	0,640	0,640	Sheet metal contaminated with fuel oil
33	Soil and stone containing hazardous substances	17 05 03*	t	0,000	0,000	0,000	1,220	1,220	Soil contaminated with oil
34	Insulation material containing asbestos	17 06 01*	t	0,000	0,499	0,000	0,000	0,499	Waste asbestos
35	Insulation material other than those mentioned in 17 06 01 and 17 06 03	17 06 04	t	0,000	0,000	0,000	0,000	0,000	Insulating braids
			t	13,300	400,000	40,000	2,520	455,820	Waste mineral rock wool
36	Insulation material containing asbestos	17 06 05*	t	0,000	1,339	0,000	0,000	1,339	Waste salonite plates
37	Mixed construction and demolition waste other than those indicated under 17 09 01 and 17 09 02 and 17 09 03	17 09 04	t	0,060	0,000	0,000	0,000	0,060	Waste graphite
			t	5.138,130	11.354,280	0,000	0,000	16.492,410	Mixed building material
38	Mixed construction and demolition waste other than those indicated under 17 09 01 and 17 09 02 and 17 09 03	19 08 14	t	11,240	0,000	0,000	0,000	11,240	Sludge from industrial waste water treatment
39	Saturated or spent ion-exchanging resins	19 09 05	t	0,000	0,800	5,360	0,000	6,160	Waste ionic mass
40	Minerals (e.g. sand and rock)	19 12 09	t	0,000	0,000	0,000	0,000	0,000	Waste white sand
41	Textile	20 01 11	t	0,000	0,000	0,000	0,000	0,000	Fire hoses
42	Fluorescent tubes and other mercury-containing waste	20 01 21*	t	0,550	0,200	0,040	0,060	0,850	Waste fluorescent tubes
			t	0,100	0,100	0,000	0,000	0,200	Waste mercury light-bulbs and thermometers
43	Batteries and accumulators included in 16 06 01, 16 06 02 or 16 06 03 and unsorted batteries and accumulators containing these batteries	20 01 33*	t	0,010	0,000	0,000	0,000	0,010	Waste batteries - alkaline, lithium

Table 65

NIKOLA TESLA TPPs BRANCH									
Taken over amounts of waste in 2021									
No	Rulebook on Waste Categories, Testing and Classification ("Official Gazette of RS", no. 56/2010, 93/2019 and 39/2021)		Unit	Organizational unit				Total	Notes
				TPP Nikola Tesla A	TPP Nikola Tesla B	TPP Kolubara A	TPP Morava		
	Name	Index number	(t)	Amounts					
1	Waste printer toner different from 08 03 17	08 03 18	t	0,000	0,000	0,000	0,000	0,000	Waste printer toners
2	Ash, slag and dust from boiler (except the dust from boiler stated in 10 01 04)	10 01 01	t	0,000	99.379,520	33.438,970	5.267,000	138.085,490	Ash and slag from oil
	Coal fly ash	10 01 02							
3	Consumed wax and grease	12 01 12*	t	0,360	0,000	0,000	0,040	0,400	Waste grease
4	Other hydraulic oils	13 01 13*	t	21,996	1,888	2,844	3,080	73,598	Waste hydraulic oils
			t	0,000	0,000	29,940	13,850		Waste turbine oils
5	Other motor oils, transmission and lubricating oils	13 02 08*	t	27,708	89,056	0,944	0,000	126,314	Waste oil for lubrication and regulation
			t	2,640	3,896	0,000	2,070		Waste engine oil, gear oil and lubrication oil
6	Other oils for insulation and heat transfer	13 03 10*	t	0,000	0,000	0,000	0,000	15,942	Hardening oil
			t	8,280	2,852	0,000	4,810		Waste insulation oil and heat transfer oil
7	Other fuels (including mixtures)	13 07 03*	t	0,780	0,000	0,000	0,000	19,240	Waste fuel oil
			t	16,160	0,000	0,000	0,000		Waste sludge and reservoir fuel
			t	2,200	0,000	0,000	0,100		Waste fuel oil
8	Other emulsions	13 08 02*	t	0,000	0,000	3,740	0,000	20,180	Emulsion from tank washing
			t	8,100	8,340	0,000	0,000		Waste emulsion (oil-water mix)
9	Wastes not otherwise specified	13 08 99*	t	0,000	0,000	0,000	0,000	0,000	A mixture of fuel oil and coal dust
10	Other solvents and solvent mixtures	14 06 03*	t	0,000	0,000	0,000	0,000	0,000	Waste solvents and solvent mixtures
11	Wooden packaging	15 01 03	t	0,000	0,000	23,300	0,000	23,300	Wooden packaging waste
			t	0,000	0,000	0,000	0,000		Metal packaging
12	Metal packaging	15 01 04	t	0,400	0,000	0,000	0,000	0,400	Waste bottles from fire extinguishers
13		15 01 10*	t	0,000	4,040	0,000	0,000	14,026	Waste packaging with high fuel oil content

NIKOLA TESLA TPPs BRANCH									
Taken over amounts of waste in 2021									
No	Rulebook on Waste Categories, Testing and Classification ("Official Gazette of RS", no. 56/2010, 93/2019 and 39/2021)		Unit	Organizational unit				Total	Notes
				TPP Nikola Tesla A	TPP Nikola Tesla B	TPP Kolubara A	TPP Morava		
	Name	Index number	(t)	Amounts					
	Packaging with residue of hazardous substances or contaminated with hazardous substances		t	0,000	0,210	0,000	0,000		Waste contaminated glass packaging
			t	3,576	2,640	0,400	0,000		Waste contaminated PVC packaging from chemicals
			t	2,840	0,000	0,320	0,000		Waste metal packaging from oil and lubricants
14	Metal packaging containing dangerous solid porous matrix (e.g., asbestos), including empty bottles under pressure	15 01 11*	t	0,000	0,000	0,000	0,000	0,000	Waste gas bottles
15	Absorbent, filter materials, wiping cloths, protective clothing contaminated by hazardous substances	15 02 02*	t	0,180	2,040	0,420	0,720	13,300	Cotton waste with oil and heavy oil
			t	0,900	0,060	0,000	0,240		Waste oily filters
			t	6,260	0,480	2,000	0,000		Waste adsorption means with oil and heavy oil
16	Waste sand	15 02 03	t	0,000	0,000	0,000	0,000	0,000	Waste sand
	Absorbent, filter materials, wiping cloths, protective clothing other specified in 15 02 02		t	0,000	0,000	0,000	0,000		Waste non-hazardous filters
17	Waste tires	16 01 03	t	2,660	2,200	0,000	1,020	80,100	Waste pneumatic tires
			t	7,580	61,440	0,000	5,200		Waste rubber conveyor belts
18	Waste vehicles not containing liquids or other hazardous components	16 01 06	t	0,000	0,000	32,700	0,000	32,700	Waste vehicles not containing liquids
19	Waste devices with mercury	16 02 13*	t	0,000	0,000	0,000	0,000	43,960	Waste devices with mercury
	Discarded equipment containing hazardous components other than those indicated under 16 02 09 and 16 02 12		t	26,980	8,600	5,440	2,940		Waste from electric and electronic devices
20	Lead batteries	16 06 01*	t	17,460	0,120	12,898	4,580	35,058	Waste lead batteries
21	Nickle-cadmium batteries	16 06 02*	t	1,140	0,000	0,000	0,000	1,140	Ni - Cd batteries
22	Waste from tank washing	16 07 08*	t	0,000	0,000	0,000	16,520	16,520	Waste from washing liquid fuel tanks
23	Tile and ceramics	17 01 03	t	0,000	0,000	0,620	0,000	0,620	Waste ceramics
24	Wood	17 02 01	t	4,760	7,660	0,000	0,000	12,420	Wood waste



NIKOLA TESLA TPPs BRANCH									
Taken over amounts of waste in 2021									
No	Rulebook on Waste Categories, Testing and Classification ("Official Gazette of RS", no. 56/2010, 93/2019 and 39/2021)		Unit	Organizational unit				Total	Notes
				TPP Nikola Tesla A	TPP Nikola Tesla B	TPP Kolubara A	TPP Morava		
	Name	Index number	(t)	Amounts					
25	Glass	17 02 02	t	0,000	0,000	0,000	0,000	0,000	Glass waste
26	Plastic	17 02 03	t	0,820	0,000	18,260	0,000	19,080	Waste mixed plastics
27	Glass, plastic and wood containing hazardous substances or contaminated with hazardous substances	17 02 04*	t	0,000	0,000	0,000	0,000	0,000	Waste railway sleepers
28	Cooper, bronze, brass	17 04 01	t	3,580	1,540	0,000	0,000	31,160	Waste and remains of coppers and brass
			t	0,000	0,000	0,000	4,120		Waste brass pipes
			t	0,660	0,520	0,000	0,000		Waste copper cables
			t	19,720	0,000	0,000	0,000		Waste copper transformer windings
			t	1,020	0,000	0,000	0,000		Waste bronze
29	Aluminium	17 04 02	t	3,260	0,000	0,000	0,000	11,980	Waste aluminium cables
			t	8,620	0,100	0,000	0,000		Aluminium miscellaneous
			t	0,000	0,000	0,000	0,000		Aluminum sheet
30	Iron and steel	17 04 05	t	0,000	0,000	0,000	0,000	2.145,240	Waste steel sheet
			t	10,200	71,940	10,100	0,000		Waste galvanized and black sheet metal
			t	0,000	0,000	0,000	0,000		Waste iron with admixtures of other substances
			t	0,000	6,220	0,000	0,000		Waste Fe combs
			t	153,180	274,960	107,660	0,000		Waste impact plates
			t	0,000	0,000	0,000	0,000		Waste boiler pipelines
			t	32,660	291,480	68,200	0,000		Waste iron up to 5mm thickness
			t	0,000	0,000	198,840	0,000		Waste grey cast
			t	9,380	21,440	0,000	0,000		Waste and remains from iron and steel
			t	164,180	548,380	138,360	0,000		Waste iron over 5mm thickness
t	0,000	0,000	13,660	0,000	Waste cast steel				

NIKOLA TESLA TPPs BRANCH									
Taken over amounts of waste in 2021									
No	Rulebook on Waste Categories, Testing and Classification ("Official Gazette of RS", no. 56/2010, 93/2019 and 39/2021)		Unit	Organizational unit				Total	Notes
				TPP Nikola Tesla A	TPP Nikola Tesla B	TPP Kolubara A	TPP Morava		
	Name	Index number	(t)	Amounts					
			t	0,000	0,000	0,000	0,000		Metal shavings
			t	7,000	0,000	0,000	0,000		Waste rail accessories
			t	7,660	0,000	9,740	0,000		Waste railway rails
			t	0,000	0,000	0,000	0,000		Waste mixed metals from magnetic separator
			t	0,000	0,000	0,000	0,000		Waste steel rolls
31	Mixed metals	17 04 07	t	18,780	2,020	0,000	0,000	23,000	Waste mixed metals
t	0,000	2,200	0,000	0,000	Waste metal veneer				
t	0,000	0,000	0,000	0,000	Valves				
32	Metal waste contaminated with hazardous substances	17 04 09*	t	0,000	0,000	0,000	0,000	0,000	Tin contaminated with fuel oil
33	Soil and stone containing hazardous substances	17 05 03*	t	0,000	0,120	0,000	1,360	1,480	Oil contaminated soil
34	Insulating materials containing asbestos	17 06 01*	t	0,000	3,000	0,000	0,000	3,000	Waste asbestos-braids
35	Insulating material other than specified in 17 06 01 and 17 06 03	17 06 04	t	0,000	0,000	0,000	0,000	14,920	Insulation braids
			t	13,300	0,000	1,620	0,000		Waste mineral rock wool
36	Construction materials containing asbestos	17 06 05*	t	0,000	2,240	8,960	0,000	11,200	Waste salonite plates
37	Mixed construction and demolition waste other than those indicated under 17 09 01 and 17 09 02 and 17 09 03	17 09 04	t	5.968,840	11.425,640	0,000	0,000	17.394,480	Mixed construction waste
38	Sludge from other industrial waste water treatments other than mentioned in 19 08 13	19 08 14	t	11,240	0,000	0,000	0,000	11,240	Sludge from industrial waste water treatment
39	Saturated or spent ion-exchanging resins	19 09 05	t	0,000	0,000	0,000	0,000	0,000	Waste ionic mass
40	Minerals (e.g. sand and rock)	19 12 09	t	0,000	0,000	82,700	0,000	82,700	Waste white sand
41	Textile	20 01 11	t	0,000	0,000	0,000	0,000	0,000	Fire hoses
			t	0,000	0,000	0,000	0,000		Waste fluorescent tubes
42	Fluorescent tubes and other mercury-containing waste	20 01 21*	t	0,000	0,000	0,000	0,000	0,000	Waste mercury light –bulbs and thermometers
			t	0,000	0,000	0,000	0,000		
43	Batteries and accumulators included in 16 06 01, 16 06 02 or 16 06 03 and unsorted batteries and accumulators containing these batteries	20 01 33*	t	0,000	0,000	0,000	0,000	0,000	Waste batteries - alkaline, lithium

3.3 Working Environment Monitoring, Occupational Safety and Health

Occupational Safety and Health Reports for 2021 include the following elements:

- **Working environment monitoring**
 - working environment noise measurements
- **Occupational Safety**
 - training
 - work injuries
- **Health**

3.3.1. Working Environment Monitoring

- **Environmental Noise Measurement**

Working environment noise monitoring hasn't been measured in 2021.

3.3.2. Occupational Safety

- **Training**

Table 66 shows a number of employees to be trained and a number of trained employees in 2021.

Table 66

NIKOLA TESLA TPPs BRANCH					
Training in 2021					
Organisational unit	Number of employees	Foreseen for training		Trained	
		број	%	број	%
Joint services	341	135	39,59	117	86,67
Nikola Tesla A TPP	708	600	84,75	418	69,67
Nikola Tesla B TPP	346	271	78,32	230	84,87
Kolubara TPP	310	241	77,74	240	99,59
Morava TPP	111	94	84,68	92	97,87
Railway transport	458	427	93,23	249	58,31
TOTAL: NIKOLA TESLA TPPs BRANCH	2.274	1.768	77,75	1346	76,13

In 2021, 1.106 PROTENT employees performing their jobs within TENT organizational unit were trained.

- **Work injuries**

Table 67 gives data on a number of injuries at work in y 2021.

Table 67

NIKOLA TESLA TPPs BRANCH						
Work injuries in 2021						
Organisational unit	Number of employees	Injuries – number of employees ratio				
		Easy	Тешке	Смртне	Easy	%
Joint services	341	1	1	0	2	0,59
Nikola Tesla A TPP	708	7	0	0	7	0,99
Nikola Tesla B TPP	346	6	1	0	7	2,02
Kolubara TPP	310	2	0	0	2	0,65
Morava TPP	111	0	0	0	0	0,00
Railway transport	458	10	1	0	11	2,40
TOTAL: NIKOLA TESLA TPPs BRANCH	2.274	26	3	0	29	1,28

3.3.3. Health Protection

Medical examinations of employees working in high-risk workplaces is carried out once a year or once in two years in accordance with assessed risks. Table 68 provides periodic examinations data verifying the work capability for 2021.

Table 68

NIKOLA TESLA TPPs BRANCH											
Work capability in 2021											
Organisational unit	Number of employee	Periodical examinations				Work capability					
		Referred to examination		Examined		Capable		Limited capability		Referred to examination	
		No.	%	No.	%	No.	%	No.	%	No.	%
Joint services	341	131	38,42	131	100,00	119	90,84	12	9,16	0	0,00
Nikola Tesla A TPP	708	627	88,56	625	99,68	554	88,64	65	10,40	6	0,96
Nikola Tesla B TPP	346	272	78,61	267	98,16	243	91,01	24	8,99	0	0,00
Kolubara TPP	310	250	80,65	242	96,80	213	88,02	28	11,57	1	0,41
Morava TPP	111	111	100,00	111	100,00	93	83,78	17	15,32	1	0,90
Railway transport	458	442	96,51	442	100,00	417	94,34	17	3,85	8	1,81
TOTAL: NIKOLA TESLA TPPs BRANCH	2.274	1.833	80,61	1.818	99,18	1.639	90,15	163	8,97	16	0,88

3.4. Public Submissions

Public submissions for 2021 are given in Table 69.

Table 69

NIKOLA TESLA TPPs BRANCH			
Public submissions in 2021			
Organisational unit	Complaint (number, date and by whom submitted)	Subject	Actions
TPP NIKOLA TESLA A	On 19.10.2021.a complaint of a natural person to the Republic Inspection for Environmental Protection	Air pollution from TENT A stack	The Republic Inspector for Environmental Protection came to TENT A on October 19, 2021. and had a conversation with employees of the Control and Environmental Protection department. Required data on the operation of units, fuel oil consumption, operation of electrostatic precipitators and the results of continuous measurement of pollutant emissions during 18.10. 2021 for TENT A were delivered by e-mail on 20.10.2021.and 18.11.2021 to the inspector. After that, there was no further action by the inspector.
TPP NIKOLA TESLA B	No public complaints		
MORAVA TPP	On 11.01.2021. a complaint of a natural person to the Republic Inspection for Environmental Protection	Air pollution from TPP Kolubara stack	On January 11, 2021. and 27.01.2021. data submitted - explanation regarding the movement and shutdown of boilers and operating hours of boilers at TPP Kolubara for the requested period, by an e-mail, to the Republic Inspector. After that, there was no further action by the inspector.

NIKOLA TESLA TPPs BRANCH			
Public submissions in 2021			
Organisational unit	Complaint (number, date and by whom submitted)	Subject	Actions
	On 26.01.2021 Complaint of a group of natural persons sent to the Republic Inspection for Environmental Protection	Noise, vibrations from coal transshipment bridges and coal dust from coal deliveries	At the request of the Chief of the Inspectorate for Environmental Protection, on January 27, 2021, the Report on noise measurement in 2020 was submitted by e-mail. In February 2021, the Republic Inspectors for Environmental Protection performed an extraordinary inspection, based on which a decision number 908-480-501-00010 / 2021-07 was issued on March 5 th , 2021. Based on the results of measurements contained in the Report on the examination of environmental noise levels in TPP "Kolubara" Veliki Crljeni in March 2021, measured values do not exceed the permissible limit values of noise levels in the environment. In April 2021, a control inspection was performed. The subject of supervision was to determine the execution of the measure ordered by Decision 908-480-501-00010 / 2021-07. In the Minutes it was established that the measures ordered by the Decision were carried out in accordance with the deadline. After that, there was no further action by the inspector.
	On 03.02.2021 Complaint of a group of natural persons sent to the Higher Court in Belgrade	Elimination of the danger of damage in accordance with Article 156 of the Law on Obligations	On 04.02.2021 the Lawsuit filed with the EPS archives under number 1.9.0.0 E 12.01-70503 / 1-2021 of the plaintiffs, etc. was received at the address of PE EPS. with a request to remove the danger of damage. The answer to the question from the lawsuit was submitted to the Sector for Energy Efficiency and Environmental Protection, which then submitted the answers to the Representation department of PE EPS.
	On 05.08.2021 Complaint of a group of natural persons sent to the Ministry of Mining and Energy	Request for information regarding the impact of TPP Kolubara on the environment and the reasons for dissatisfaction of the citizens of Veliki Crljeni	The Ministry of Mining and Energy requested by e-mail from the EPS cabinet information regarding the impact of TPP Kolubara on the environment and the reasons for the dissatisfaction of the citizens of Veliki Crljeni with the deadline until August 6 th , 2021. years. On 06.08.2021. the answer was submitted to the Executive Director for Electricity Production of the PE by an e-mail.
	On 26.10.2021 Complaint of the lawyer on behalf of the residents of Veliki Crljeni sent to the City of Belgrade, the Secretariat for Inspection Affairs	Scattering of ash when transporting ash by trucks	General Directorate of the City of Belgrade, Secretariat for Inspection Affairs, Sector for Inspections for Environmental Protection and Tourist Inspection sent a letter to the Ministry of Environmental Protection Sector for Environmental Supervision and Precaution, registered under number 48007 353-03-2935 dated 26 th October 2021. on the basis of the lawyer's submission which refers to the problems related to the removal of ashes from TPP Kolubara.

NIKOLA TESLA TPPs BRANCH			
Public submissions in 2021			
Organisational unit	Complaint (number, date and by whom submitted)	Subject	Actions
			TPP Kolubara has submitted a statement to the Ministry by Letter number 20600-E03.04.-544808 / 1-2021 from 03.11.2021. on the requested data and by e-mail to the Republic Inspector for Environmental Protection. After that, there was no further action by the inspector.
	On 05.11.2021 a complaint of a natural person to the Republic Inspection for Environmental Protection	Noise from the TPP Kolubara plant	The Republic Inspection received a submission via e-mail from the residents of Veliki Crljeni regarding the noise from the plant. On 05.11.2021. the requested data was submitted to the inspector by e-mail. After that, there was no further action by the inspector.
MORAVA TPP	No public complaints		

4. TPPS KOSTOLAC BRANCH

TPPs Kostolac branch comprise the following organisational units:

- **TPP Kostolac A**
- **TPP Kostolac B**
- **Drmno OCM**
- **Ćirikovac OCM**

4.1. Overview and Status of Permits

Table 70 provides overview of obtained permits and applications for new permits or extension of existing ones in 2021 –TPPs Kostolac Branch“.

Table 70

TPPs KOSTOLAC BRANCH			
Overview and permit status for 2021.			
Organizational unit	Acquired permits and approvals (number and date)	New applications for permits or extension of valid permits	Note
TPP KOSTOLAC A	<p>Decision on issuing a water permit for the method of capturing and using water from the system of supply and discharge of cooling water into the drainage system and then into the Danube No. 325-04-00597 / 2021-07 dated 03.09.2021.</p> <p>Decision on issuing a water permit for the manner, conditions and scope of transport of process water and hydraulic transport of ash and slag of TPP Kostolac A to the ash and slag landfill on the Middle Kostolac Island No. 325-04-00616 / 2021-07 dated 03.09.2021.</p> <p>Decision - Approval to the Environmental Impact Assessment Study of the legalization project for transport and disposal of ash and slag from TPP "Kostolac" A to the landfill OCM "Ćirikovac" No. 353-02-2599 / 2020-03 dated 16.12.2021.</p>	-	-
TPP KOSTOLAC B	<p>Decision on issuing a water permit for the manner, conditions and scope of capture and use of Danube water through the supply canal (old Mlava riverbed) and part of drainage water from the open cut mine "Drmno" and drainage and discharge of cooling water into the drainage canal (new Mlava riverbed) for thermal power plant "Kostolac" B for Units B1 and B2 - no. 325-04-00927 / 2021-07 dated 29.10.2021.</p> <p>Certificate of entry in the register of by-products - solid waste based on calcium - NUS 1 no. 19-00-00872 / 2020-06 dated 11.01.2021.</p> <p>Certificate of entry in the register of by-products - solid waste based on calcium - NUS 2 No.19-00-00303/2021-06 dated 12.04.2021.</p> <p>Certificate of entry in the register of by-products - solid waste based on calcium - NUS 3 no.19-00-00597/2021 dated 02.08.2021.</p>	<p>Submission of a harmonized application for the issuance of a use permit for a flue gas desulphurization plant TPP "Kostolac" B no. ROP-MSGI-39126-IUPH-6/2021 dated 22.12.2021.</p>	-

4.2. Monitoring and Environmental Impact

4.2.1. Air Quality Measurements

Air quality monitoring in the vicinity of the TPPs Kostolac Branch organisational units is carried out as a part of the Monitoring Plan of the Environmental Management Department. It should be noted

that the air quality monitoring in the vicinity of the TPPs Kostolac Branch is financed by EPS that employs an authorized legal entity.

There is a measuring point with automatic measurement of pollutants (sulphur dioxide, nitrogen oxide and carbon monoxide), belonging to the national automatic air quality monitoring network, and under the jurisdiction of the Agency for Environmental Protection.

Air quality measurements in the area of the TPPs Kostolac Branch have been performed internally for over 30 years by the Environmental Management Department not authorised for total particulate matter and SO₂ measurements (Environmental Management Department Laboratory accreditation activities are in progress). Since 2008 air quality measurements in the area of the TPPs Kostolac Branch have been performed by authorized legal entities employed by EPS via TPPs Kostolac Branch.

During 2021, for EPS, air quality measurements in the TPPs Kostolac Branch area were performed by the authorized laboratory with the Institute of Public Health, Pozarevac (No. of authorization for immission measurements 353-01-00436/2014-08 dated 15.04.2014) and laboratory for environmental and occupational area protection „Occupational and environmental protection Belgrade“ Belgrade, Deskaseva no. 7 (no. of the authorization for immission measurement 353-01-02540/2020-03 dated 04.02.2021).

Total particulate matter (TPM), sulphur oxides (SO₂), suspended particulate matter (PM₁₀), soot and heavy metals (Pb, Cd, As and Ni) were identified by analysing samples collected within one month for TPM, while SO₂ concentrations were determined by analysing 24-hour air samples.

SO₂ and soot concentrations were measured on 5 measuring points, as follows:

1. Klenovnik – Klenovnik Local Community
2. Stari Kostolac – Local Community
3. Drmno – Medical centre
4. Cirikovac – Cirikovac OCM administrative building
5. Kostolac – the Kostolac municipality building

TPM content was measured on 5 measuring points, as follows:

1. Klenovnik – Klenovnik Local Community
2. Stari Kostolac – St. George Church
3. Drmno – Medical centre
4. Cirikovac – administration building of Cirikovac OCM
5. Kostolac – Kostolac municipality building

Suspended particulate matter - PM₁₀ was measured on 5 measuring points:

1. Cirikovac – Cirikovac OCM administrative building
2. Drmno – Georad company;
3. * - Kostolac – Prim company – up to June 2021.
- Petka – since June 2021
4. Klenovnik – Kostolac Usluge Klenovnik
5. Kostolac – Kostolac municipality building

*Based on the Records on inspection supervision number 910-480-501-00043 / 2020-04 from 17.11.2020, the obligation to introduce the measuring point Petka for measuring the concentration of suspended PM₁₀ particles was imposed on From January to June 2021, the measurement of the concentration of suspended PM₁₀ particles was performed at the measuring point Kostolac Prim, and from June of the same year, the mentioned measuring point was abolished and a new one was introduced - the village of Petka.

Suspended particulate matter PM₁₀ were measured in 2021 seven days in each month on each above mentioned measuring points.

For suspended particulate matter PM₁₀ refers to number of measurements performed on the above mentioned measuring points – measurements were not done all 365 days a year for each measurement point, but 84 measurement days a year on measuring points Cirikovac –

administrative building OCM Cirikovac (I), Drmno – Georad company (II), Klenovik – Kostolac Usluge (IV), Kostolac – the Kostolac municipality building (V), except for Kostolac – PRIM (III) and village Petka (III*) where measurements were done 42 days.

The authorized legal entity provided an interpretation of the results of measurements done for EPS in its Air Quality Annual Report 2021, according to the Regulation on conditions for monitoring and air quality requirements.

Table 71 shows the 2021 air quality data analysis done by the authorized legal person, in terms of their compliance with legal requirements, for OCMs Kostolac Branch organisational units. Comparison between the results obtained in the defined periods, with limit values from the Regulation on conditions for monitoring and air quality requirements was done by comparing measured values with the values prescribed by the Regulation on conditions for monitoring and air quality requirements (Official Gazette of RS, No. 11/2010, 75/2010 and 63/2013).

Table 71

Kostolac TPPs and OCMs Branch						
Air quality in 2021						
Legal compliance (number of data or days exceeding the defined values)						
Air quality indicators	Averaging period	TPM content (mg/m ² /day)	Soot (µg/m ³)	SO ₂ (µg/m ³) concentration		
		Maximum permissible value (MPV)	Maximum permissible concentration (MPC)	LV	TV	LT
One hour		-	-	350 (At most 24 times in a calendar year)	350	0
*One day		-	50	-		-
**One month		-	-			
***Calendar year		200	50	50		-
		-	-	No measurements		
*	Measuring points	-	No exceedance	No exceedance of limit values for sulphur dioxide concentration more than admissible 24 days in a calendar year		
**	1	March 508,6mg/m ² /day exceedance	-	-		
	2	April 797,7 mg/m ² /day exceedance				
	3	No exceedance				
	4	May 1072,67 mg/m ² /day exceedance				
	5	No exceedance				
***	1	No exceedance	No exceedance	-		
	2	No exceedance				
	3	No exceedance				
	4	No exceedance				
	5	No exceedance				
Air quality indicators	Particulate matter PM ₁₀ (µg/m ³)					
Averaging period	LV	TV	LT			
*One day	50 (at most 35 times in a calendar year)	50	0			
***Calendar year	40	40	0			
*	1	Exceedance of 9 days out of 84 days in total	9 days out of 84 days			
	2	Exceedance of 7 days out of 84 days in total	7 days out of 84 days			
	3	Exceedance of 4 days out of 84 days in total	4 days out of 84 days			
	4	Exceedance of 3 days out of 84 days in total	3 days out of 84 days			
	5	Exceedance of 10 days out of 84 days in total	10 days out of 84 days			

LV – Limit value, TV – Tolerance value, LT – Limit tolerance

4.2.2. Emission Measurements of Matters Affecting Air Quality

Total sulphur content of the Kostolac lignite used for combustion in the Kostolac TPPs and OCMs Branch is around 1.3%.

Flue gases containing sulphur dioxide, nitrogen oxides, carbon dioxide and dust, after treatment, i.e. dust separation by electrostatic precipitators are emitted into the air through stacks:

Kostolac A TPP

- 105m - Unit A1 (K1 (1 ESP) and K2 (1 ESP))
- 110m - Unit A2 (1 ESP)

Kostolac B TPP

- 250m units B1 (1 ESP) and B2 (1 ESP)
- 180 m after construction of FGD plant for units B1 and B2 (each boiler has its own flue gas pipe)

In accordance with legal requirements occasional individual measurements of emission of matters affecting the air quality are performed regularly and continuous measurements are also performed on all Kostolac TPPs and OCMs Branch units.

▪ **Continuous and control measurements to check the accuracy of continuous measurements for TPP Kostolac A and TPP Kostolac B that affect air quality**

During 2021, continuous measurements of air pollutant emissions were performed on the units of TPP "Kostolac" A, based on the obtained consent by the Decision of the Ministry of Environmental Protection for independent measurement of pollutant emissions for TPP "Kostolac" A - no. 353-01-01913 / 2019-03 dated 23.10.2019. year and TPP "Kostolac" B on the basis of the obtained consent by the Decision of the Ministry of Environmental Protection for independent measurement of emissions of pollutants for TPP "Kostolac" B - no. 353-01-01225 / 2018-03 dated 20.12.2019.

During 2021, the flue gas desulphurization plant at the location of TPP "Kostolac" B was in trial operation, functional tests were performed in order to adjust the operation of this plant, due to which it was occasionally out of operation. After desulphurization, waste gases are discharged through a newly built chimney on which automatic devices for continuous measurement are installed, for which TPP "Kostolac" B has the consent of the competent Ministry for independent continuous measurement of emissions.

Continuous measurements include: parameters of flue gases (temperature, pressure and humidity), volume flow, oxygen content, mass concentrations as well as calculations of emission factors for sulfur dioxide (SO₂), nitrogen oxides (NO_x), carbon monoxide (CO) and powdered substances.

In 2021, the thermal power plant "Kostolac" B achieved 6275 working hours out of a total of 7575 operating hours in the trial period through the system for purification of pollutant emissions, while unit B2 out of a total of 7427 operating hours achieved operation of 5215 hours with flue gas desulphurization system. The operation of the flue gas desulphurization system significantly reduced the output concentration of sulfur oxide, which at the entrance to the plant was about 5000-6000 mg / Nm³, depending on several factors, so that the average annual concentration at the exit of unit B1 was 159.28 mg / Nm³ (while on unit B2 the output concentration was 186.70 mg / Nm³ (average annual value), and there was a significant reduction in emissions of powdered substances expressed as a concentration in mg / m³ as they were reduced from 50mg / m³ to below 20mg / m³.

For the time period in which the units of TPP "Kostolac" B performed operation, and the flue gas desulphurization plant did not work, the calculation was performed on the basis of periodic measurement of pollutant emissions by the authorized laboratory of the Vinca Institute“.

During the trial operation the flue gas desulphurization plant димних achieved desulphurization level of 96,63%-97,13%.

Table 72 gives an overview of the continuous and occasional measurement results for the emission of dust in TPP „Kostolac“ B (mean annual values).

Table 72

TPPs KOSTOLAC BRANCH			
Occasional and continuous dust emission measurements in 2021			
TPP Kostolac B1 and B2		Occasional	Continuous
Particulate matter (mg/Nm³)	TEKO B1	34,56	8,62
	TEKO B2	29,63	21,42

Table 73 gives overview of the average annual value results of continuous measurements of emissions affecting air quality for TPPs and OCMs Kostolac Branch, TPP Kostolac A1 and A2 and occasional measurements in TPP Kostolac B, in Units B1 and B2 for 2021“.

Occasional measurements for units of TPP Kostolac B, were done in June and December 2021.

Table 73

KOSTOLAC TPPs and OCMs Branch				
Continuous measurements TPP Kostolac for 2021				
Mass concentrations of matters affecting air quality (mg/Nm³)				
Organizational unit	TPP Kostolac A		TPP Kostolac B	
	A1	A2	B1	B2
Boiler				
Heat capacity MWt	358	689	1.077,5	1.077,5
SO₂	5148,99	5043,19	159,28	186,70
NO_x (NO₂)	313,40	472,6	223,09	209,69
CO	88,36	42,30	331,26	159,69
Particulate matter	103,90	63,10	8,62	21,42

▪ Continuous emissions measurements of matters affecting air quality

Between 2006 and 2014, at the Kostolac TPPs and OCMs Branch, devices for continuous measurement of matters affecting air quality (SO₂, NO_x, CO and dust) were installed– at Kostolac B TPP units (SO₂, NO_x and dust) and TPP Kostolac A2 unit, while at TPP Kostolac A1, continuous measurements (SO₂, NO_x, CO and dust) have been performed since 2nd February 2018. In addition to these basic devices, data acquisition and processing equipment was also installed and additional measurement devices: oxygen (O₂) content and humidity as well as temperature, pressure and flue gases flow volume.

TPP „Kostolac“ A

Consent to continuous measuring at the unit A1 was obtained by the decision of the Ministry of Environmental Protection no. 353-01-00182/2018-03 dated 02.02.2018. TPPs and OCMs Kostolac Branch for TPP A submitted a request for obtaining consent to continuous measuring for units A1. Consent to continuous measuring for the units A1 and A2 was obtained by the decision of the Ministry no. 353-01-01913/2019-03 dated 23.10.2019 and thus the previously obtained decision on consent for the unit A1 ceased to be valid. Consent to continuous measuring of A1 and A2 units emissions was obtained for: sulfur dioxide, nitrogen oxides, carbon monoxide and particulate matters.

In September 2021, the Annual Control Test of automatic measuring systems on A1 stack was done, Report No. E-30/21/Petroprocess/TEKO-A1/ AST and the Annual Control Test on A2 stack, Report No. E-29/21/TEKO-A2/ AST by the Mining Institute Belgrade.

TPP „Kostolac“ B

Kostolac B TPP comprises two identical units, each of 348.5 MW. Each unit has its own electrostatic precipitator with two branches. Continuous emission measurement devices for SO₂, NO_x, CO and dust, as well as O₂ content and flue gas flow rate were installed on the flue duct behind the electrostatic precipitator, before ID fan.

New equipment for flue gas and dust emissions measurement has been installed in newly constructed desulphurization plant in Kostolac B (B1 and B2) TPP units downstream of stack desulphurization plant. Trial run of the plant was performed in the first quarter of 2019. After the trial run, performance measurements were done. After the performance measurements, QAL 2 and QAL 3 measurements were performed at TEKO B1 and B2 unit. The branch of TPP KO "Kostolac" B, by the decision of the Ministry of Environmental Protection from December 20th, 2019, received consent for continuous measurement of emissions from a stationary source (after the desulphurization plant) for units B1 and B2. In December 2021, the Ministry of Construction, Transport and Infrastructure received an amended Report from the Commission for Technical Inspection of Works on the Construction of EDC Plants in TPP "Kostolac" B and submitted a request for the issuance of a use permit no. ROP-MSGI-39126-IUPH-6/2021 dated 22.12.2021.

In August 2021, a test of the correctness of automatic measuring systems for continuous emission measurement according to the requirements of SRPS EN 14181 was performed on both units of TPP "Kostolac" B. The annual control test of automatic measuring systems on the chimney on unit B1 was performed at the exit of FGD Reports E-25/21 / Petroprocess / TEKO-B1 / AST and on the chimney of unit B2 at the exit of FGD Reports E-26/21 / TEKO-B2 / AST by the Mining Institute Belgrade.

In August 2021, a test of the correctness of automatic measuring systems was performed in accordance with the level 3 (QAL3) confidence assurance for the period from July 2020 to August 2021 no. QAL 3-05/21/JPEPS/TEKO B.

Table 74 provides an overview of data on the equipment of units with equipment for continuous measurement of emissions of substances that affect air quality in organizational units Branch TPPs "Kostolac", ending in 2021.

Table 74

TPPs Kostolac Branch								
Level of unit being equipped with devices for continuous emission measurement as of 2021								
Analysers	Particulate matters	Emitted matters		Parameters				
		Gases		Content			p и t	Flow rate
		SO ₂ , NO _x (NO ₂), CO; particulate matters	HCl и HF	Humidity	CO ₂	O ₂		
TPP KOSTOLAC A	A1	Devices installed on the unit A1 stack, 4 parameters monitored Stack height is 105 m. Platform is located at the level 60 m.	Devices installed for both boilers on the stack	-	-	-	Devices on the stack	Measurement exists
	A2	A2: ESP left and right side (branch), on the stack, at the level of 63 m, external stack lining. Platform is located on the level of around 61m. Stack height – 110m. Total: 3 devices	One device installed	-	-	-	Devices installed on the stack, Total: 1 device In 2015, devices were installed for measurement of wet O ₂ and flue gas flow rate on the stack	Measurement at this unit exists
TPP KOSTOLAC B	B1	Devices installed on each unit on flue gas ducts behind each ESP, before (IDF). Total:2 devices	Devices installed on each unit behind ESP, before ID fan.	-	-	-	Devices installed on each unit behind ESP, before ID fan. Total: 2 sets	2 devices Installed on each of the units
	B2	B1: ESP1 and B2: ESP2	Total: 2 sets	-	-	-		

TPPs Kostolac Branch								
Level of unit being equipped with devices for continuous emission measurement as of 2021								
Analysers	Particulate matters	Emitted matters		Parameters				
		Gases		Content			p i t	Flow rate
		SO ₂ , NO _x (NO ₂), CO; particulate matters	HCl и HF	Humidity	CO ₂	O ₂		
TPP KOSTOLAC B	B1	Devices installed after desulphurization plant (new stack height 180 m). Each unit has its own flue gas pipe. Devices for continuous emission measurement installed on each flue gas pipe	Devices installed on each flue gas pipe	-	-	-	Devices installed on each flue gas pipe (2 sets)	Devices installed on each flue gas pipe
	B2			-	-	-		

Data acquisition and processing equipment is an integral part of this equipment.

HF and HCl continuous measurement equipment has not been installed on any of the Kostolac TPP units.

Software performing statistical analysis of continuous measurements data (SO₂, NO_x (NO₂), CO and dust) is in operation on Kostolac A and Kostolac B TPP units. New flue gas and dust emission monitoring equipment has been installed (on the stack) after the FGD plant and new data processing software package has been installed, as well.

▪ Annual emissions of matters affecting air quality

Table 75 gives overview of dust emission, SO₂, NO₂, CO for TPP Kostolac in 2020. In units A1 and A2 mean values of mass concentration and volume flow are calculated on the base of received results from continuous emission measurements in period between 1st January and 31st December 2021. during calculation of mass emissions of kg/t. In units B1 and B2 mean values of mass concentration and volume flow were calculated based on data of periodic measurements of air pollutant emissions (inspection report by Vinca) and automatic emission measurement on the chimney of the FGD plant. The table shows the annual emissions of pollutants into the air in kg / year from TPP "Kostolac" B, which were calculated on the basis of continuous measurements on the new chimney in the conditions of desulphurization plant and occasional measurements on the old chimney where waste gases are discharged. they did not pass through the desulphurisation plant. Data on working hours of TPP "Kostolac" A and TPP "Kostolac" B were taken over from the Process Analysis Department.

Table 75

TPPs Kostolac Branch					
Emissions of matters affecting air quality (t/year) in 2021					
Organisational unit	Particulate matters	SO ₂	NO _x (NO ₂)	CO	CO ₂
TPP Kostolac A					
A1	397,13	19.947,72	1.211,95	223,72	819.861,58
A2	434,83	34.804,83	3.260,85	3.679,21	1.580.487,40
Total Kostolac A	831,96	54.752,55	4.472,80	3.902,93	2.400.348,98
TPP Kostolac B					
B1	143,86	10.076,10	2.562,64	260,81	2.374.941,55
B2	266,24	15.939,10	2.275,12	136,82	1.580.487,40
Total Kostolac B	410,10	26.015,20	4.837,76	397,63	3.955.428,95
TOTAL: TPPs and OCMs KOSTOLAC BRANCH	1.242,06	80.767,75	9.310,56	4.300,56	6.355.777,93

Table 76 gives an overview of the fuel consumption in 2021.

Table 76

Kostolac TPPs and OCMs Branch		
Fuel consumption in 2021		
Fuel	Unit	Fuel consumption (t/year)
KOSTOLAC A TPP		
COAL	A1 - K1	-
	A1 - K2	-
	A1	949.531
	A2	1.841.174
	TOTAL	2.790.705
PETROLEUM	A1 - K1	-
	A1 - K2	-
	A1	2.206
	A2	1.854
	TOTAL	4.060
KOSTOLAC B TPP		
COAL	B1	2.749.342
	B2	2.786.877
	TOTAL	5.536.219
HEAVY FUEL OIL	B1	2.342
	B2	2.529
	TOTAL	4.871

▪ **Harmonization of emissions of matters affecting air quality with EU legislation**

Units B1 and B2 of TPP Kostolac are on the final list of old big plants for combustion in National plan for emission reduction according to the letter of the Environmental Protection Ministry no. 353-01-00122/2017-03 dated 29.12.2017 and in accordance with the National Plan for the Reduction of Emissions of Major Pollutants from Old Large Combustion Plants ("Official Gazette of RS", No. 10 of February 6th, 2020).

Particulate matters

To date electrostatic precipitators were reconstructed on all Kostolac TPP units: on units A1 and A2 - Kostolac A TPP, units B1 and B2 - Kostolac B TPP. Guaranteed mass concentration for dust defined by the equipment supplier at the electrostatic precipitator outlet is $\leq 50 \text{ mg/Nm}^3$ which is in line with the EU and Serbian legislation.

Sulphur dioxide

During the design and construction of Kostolac A and B TPP, no measures were taken to reduce SO_2 emissions, given that at the time no SO_2 emission limit values (ELVs) were stipulated.

Mass concentration of SO_2 in the flue gas are well above ELVs prescribed by Serbian and EU regulations. In order to reduce sulphur oxide emissions below 200 mg/Nm^3 in accordance with EU legislation desulphurization plant construction was finished at the end of December 2016, as well as new stack with two pipes (each unit, B1 and B2, has its own pipe). Performance measurements were executed during operation of each unit individually and during simultaneous operation of units. Since October 2020, the flue gas desulphurisation plant is in trial run. During 2021, 80% in average has been achieved in trial run from total operation time in power system.

Nitrogen oxides

New burners were installed on TEKO B unit B1 during unit revitalisation in 2014 to reduce nitrogen oxides emissions below the level of 200 mg/Nm^3 . Measurement results indicate considerable nitrogen oxides emission reduction. Emissions prior to reconstruction ranged from 450 to 600 mg/Nm^3 , average value of two occasional measurements of nitrogen oxides in Unit B1 was $228,2 \text{ mg/Nm}^3$ in 2020.

During 2019, system for reduction of nitrogen oxides on TPP Kostolac B2 was installed.

Based on results of continuous measurements, the mean measured value of nitrogen oxides in 2021 for unit B1 was $223,09 \text{ mg/Nm}^3$, and for unit B2 it was $209,69 \text{ mg/Nm}^3$.

It is planned to implement a measure on secondary reduction of nitrogen oxide emission by controlled adding of urea in TPP Kostolac B for 2023.

4.2.3. Emission Measurements of Matters Affecting Water Quality

Water used to cool condensers' steam has the highest share in process water used by Kostolac TPPs. Water used for this process is captured from the Danube River. To be precise, the captured river water is first used to cool the condensers and subsequently discharged into the recipient (Danube - Kostolac A or Mlava - Kostolac B) via the return channel.

A small share, about 2.5% of water is used for hydraulic transport of ash and slag. By transition to, i.e. connecting the Kostolac B TPP units to the thick slurry transport system (solids: water ratio - 1:1) water consumption is reduced. Under the thick slurry transportation system in place at the Kostolac B TPP there is no overflow water, while the created drainage water is recycled (returned) from the ash landfill to the thermal power plant and reused for hydraulic transport of ash and slag. During 2021, sampling and testing of wastewater was performed, which was drained under the Ćirikovac ash disposal site, then discharged into the Mlava River via the main water reservoir. The quality of the Mlava River is controlled upstream and downstream from the discharge of drainage water from the main water reservoir, and during 2021 the quality of drainage water from the gypsum landfill was examined.

Decarbonised water of Kostolac A TPP is partly used for cooling while the other part is treated with ion exchangers (ion mass) to obtain demineralised water.

Demineralised water (demi water) used by the boiler water-vapour system is produced by chemical water treatment plants. Demi water is produced by chemical purification of groundwater - Kostolac B TPP or by purification of river water (Danube) - Kostolac A TPP in ion exchangers.

Plant for water preparation for the purpose of supplementing the remote heating system of the cities of Kostolac and Pozarevac was put in operation.

Raw water is captured from tube wells located along the Mlava River bank. HCl or NaOH solution is used to regenerate ion masses in ion-exchange columns, resulting in acid and alkaline wastewater partly used by the ash and slag transportation system of Kostolac B TPP, while in the case of Kostolac A TPP regeneration products are discharged into the return cooling water channel (hot water channel).

Sanitary wastewater is discharged directly or indirectly into the river (Mlava) after mechanical-biological treatment under aerobic conditions by treatment devices (Kostolac B TPP). Sanitary wastewater of Kostolac A TPP is discharged into the municipal sewage system which is subsequently discharged into the Kostolac A TPP return cooling water channel.

After water containing oil and/or heavy fuel oil and/or petroleum is collected, only water containing petroleum is pumped back into the tank. Wastewater is discharged through storm sewage into the Kostolac A TPP hot water channel while waters containing heavy fuel oil are transported to the slurry station and subsequently to the OCM Ćirikovac ash landfill.

The TPPs Kostolac Branch Wastewater Management Programme includes physical, chemical, bacteriological and radiological measurements of the following parameters: air and water temperature, water turbidity, pH, electrical conductivity, soluble O₂, % of O₂ saturation, COD, BOD₅, unfiltered water evaporation residue, filtered water evaporation residue, total suspended particulate matter, particulate matter, total surfactants, mineral oils, phenols, alkalinity, F, Cl, NO₂, NO₃, SO₄, PO₄, NH₄, Ca, Mg, hardness, Al, Fe, Mn, Cd, Cr⁶⁺, total Cr, Cu, Ni, Zn, Pb, Hg, As, B, α and β activity, microbiological analysis of the waters in the recipient.

Monitoring also includes:

- Wastewater quality at the source point and/or at the point of discharge into the river and/or at the point of discharge into the returning cooling water duct;
- Receiving water quality – wastewater recipient quality on profiles upstream and downstream the wastewater discharge point;

- Quality of groundwater in the area of the SKO ash and slag landfill and OCM Cirikovac, at the coal depot of the Kostolac B TPP, in the area of the oil tanks at TPP-OCM A and in the area of the gas station at OCM Drmno;
- Quality of sanitary water from the plants in TPP Kostolac B;
- Quality of waters coming from the plants for treating water contaminated with oil and fuel oil in Kostolac B TPP.

Long-term studies have shown that concentrations of sulphate and arsenic are essential parameters used to monitor the ash landfill impact on groundwater. Sulphate ions originating from the landfill migrates fastest, and is considered to be an excellent tracer to monitor the groundwater impact of landfills. On the other hand, arsenic reaches groundwater much slower because it is previously adsorbed by the aluminosilicate surface (landfill ash and/or clay making an integral part of the soil). Drmno OCM dewatering water quality is also monitored. Drmno OCM dewatering water is discharged to the Mlava and/or Danube rivers, and partly used as cooling water by Kostolac B TPP.

TPPs Kostolac Branch wastewater quality and its impact on recipients is controlled 12 times a year and 4 times a year for groundwater and sanitary water in line with the Law on Waters (Official Gazette of RS, no. 30/2010, 93/2012, 101/2016, 95/2018) and The Rulebook on Methods and Conditions for Wastewater Quantity Measurement and Quality Testing, and the Content of the Measurement Report (Official Gazette of RS, no. 33/2016), Regulation on pollutants' emission limit values in waters and deadline for their achievement (Official Gazette of RS, no. 67/2011,48/2012,1/2016).

Annual surface and ground water quality reports for each organizational unit of the TPPs Kostolac Branch are made available on request to competent inspectors and relevant institutions when providing opinions required for the issuing of water conditions and water permits.

Water quality measurement results are presented in the Environmental Report prepared every year for each organisational unit. In addition, results are presented in the National Pollution Sources Register of Serbia sent by the TPPs Kostolac Branch each year in accordance with the legal obligation to the Environmental Protection Agency.

TPPs Kostolac Branch surface and ground water quality was controlled in 2021 by the accredited legal person for chemical testing, Mining and Metallurgy Institute Bor and Institute for Occupational Safety Novi Sad.

Table 77 provides the analysis of wastewater and recipient watercourse quality data in 2021 in terms of their legal compliance.

In the case of surface waters, legal compliance is evaluated by comparing the measured values of substances affecting water quality with the limits defined by the Regulation stipulating limit values for pollutants in surface and ground waters and sediments, and deadlines for their achievement (OG RS № 50/2012) while wastewater values are compared with the limits defined by the Regulation stipulating limit values of pollutants emissions in water and deadlines for their achievement (OG RS № 67/2011, 48/2012 and 1/2016). From the thermal power plant "Kostolac" B and TPP "Kostolac" A there are no discharges of wastewater with hazardous substances from the REGULATION on the limit values of priority and priority hazardous substances that pollute surface waters and deadlines for their achievement.

Table 77

Kostolac TPPs & OCMs Branch		
Wastewater and watercourses-recipients quality in 2021		
Organisational unit	Organisational unit	Organisational unit
Water type		
Drainage wastewater from the ash landfill	<ul style="list-style-type: none"> ▪ Electrical conductivity:746-1063 µs/cm ▪ Arsenic:10- 50µg/l ▪ Sulphates: 266,7-436,1 mg/l 	Main watersump at OCM Cirikovac landfill Electrical conductivity: 1961-2380 µs/cm <ul style="list-style-type: none"> ▪ Arsenic: 10-28 µg/l ▪ Sulphates: 628,7-876,1 mg/l

Kostolac TPPs & OCMs Branch		
Wastewater and watercourses-recipients quality in 2021		
Organisational unit	Organisational unit	Organisational unit
Water type		
Overflow wastewater from the ash landfill	<ul style="list-style-type: none"> ▪ Electrical conductivity: 600,0-805,0 µs/cm ▪ Arsenic: 10-85 µg/l ▪ Sulphates: 153,9-311,7 mg/l 	
Watercourse (recipient)	<p>There were no significant changes in the Danube River quality upstream – downstream from Kostolac A TPP: Danube upstream</p> <p>Arsenic: <10 µg/l, below MLC-50 µg/l, upstream and downstream from the discharge point</p> <ul style="list-style-type: none"> ▪ Sulphates: 15,74-34,08 mg/l I upstream and, 21-68-44,2 mg/l downstream ▪ Mineral oil, at the Danube testing points upstream and downstream < 20 µg/l <p>No temperature increase of the Danube River water</p>	<p>There were no significant changes in the Mlava River quality downstream - upstream from Kostolac B TPP:</p> <p>arsenic: upstream and downstream <10 µg/l from the discharge point</p> <ul style="list-style-type: none"> ▪ sulphates: 20,03-30,5mg/l upstream, 20,05-33,3 mg/l downstream ▪ Mineral oil in the Mlava River upstream and downstream was < 11,5 µg/l <p>No temperature increase of the Danube River water</p>

Table 78 provides the analysis of groundwater quality data in the piezometers at the locations of Kostolac TPPs. During 2021 groundwater quality was controlled in 14 piezometers.

Table 78

Kostolac TPPs Branch			
Groundwater quality in 2021			
Concentration	Permitted values		Organisational unit
	MPC	RV	
Sulphates (mg/l)	250		<p>in piezometers around cassette B ranging: 177,40-339,10</p> <p>in piezometers around cassette C ranging: 39,23-363,2</p> <p>in piezometers around the Cirikovac ash landfill: 7,0-442,30</p> <p>piezometers away from the SKO landfill: 191,90-518,60</p> <p>around the coal yard D5: 32,86-52,19</p> <p>piezometers around oil tanks TPP A: 24,25-144,80</p> <p>piezometers around gas station OCM Drmno: 35,17-108,10</p>
Arsenic (µg/l)	10	60	<p>in piezometers around cassette B ranging: 10-131</p> <p>in piezometers around cassette C ranging: 10-43</p> <p>in piezometers around the Cirikovac ash landfill: 10-15</p> <p>piezometers away from the SKO landfill: 10-20</p> <p>around the coal yard D5: 10</p> <p>piezometers around oil tanks TPP A : 10-17</p> <p>piezometers around gas station OCM Drmno: <10</p>
Zink (mg/l)	3.000	800	<p>in piezometers around cassette B ranging: 30-455</p> <p>in piezometers around cassette C ranging: 30-8930</p> <p>in piezometers around the Cirikovac ash landfill: 30-329</p> <p>piezometers away from the SKO landfill: 30-8770</p> <p>around the coal yard D5: 1180-3720</p> <p>piezometers around oil tanks TPP A – 30-3720</p> <p>piezometers around gas station OCM Drmno – 30-720</p>
Manganese (mg/l)	50		<p>in piezometers around cassette B ranging: 0,0004-0,115</p> <p>in piezometers around cassette C ranging: 0,006-0,036</p> <p>in piezometers around the Cirikovac ash landfill: 0,008-0,472</p> <p>piezometers away from the SKO landfill: 0,004-1,270</p> <p>around the coal yard D5: 0,137-0,258</p> <p>piezometers around oil tanks TPP A : 0,008-0,485</p> <p>piezometer around gas station OCM Drmno: 0,131-1,786</p>

Kostolac TPPs Branch			
Groundwater quality in 2021			
Concentration	Permitted values		Organisational unit
	MPC	RV	TPP Kostolac A and TPP Kostolac B
Ammonia (mg/l)	0.1		in piezometers around cassette B ranging: 0,078-0,162 in piezometers around cassette C ranging: 0,078-0,10 in piezometers around the Cirikovac ash landfill: 0,078-2,80 piezometers away from the SKO landfill: 0,078-0,390 around the coal yard D5: 0,078-0,178 piezometers around oil tanks TPP A: 0,078-0,622 piezometer around gas station OCM Drmno: 0,078-0,10
Nitrites (mg/l)	0.03		in piezometers away from the SKO landfill: 0,003-0,161 in piezometers within the SKO landfill (cassette B): 0,003-0,035 piezometer around gas station OCM Drmno: 0,003-0,018 in piezometers around cassette C ranging: 0,003-0,018 in piezometers around the Cirikovac ash landfill: 0,030-0,01 around the coal yard D5: 0,003-0,01 piezometers around oil tanks TPP A: 0,003-0,04 piezometer around gas station OCM Drmno: 0,003-0,01
Nitrates (mg/l)	0.05		in piezometers around cassette B ranging: 0,11-0,51 in piezometers around cassette C ranging : 0,11-0,725 in piezometers around the Cirikovac ash landfill: 0,113-8,96 piezometers away from the SKO landfill: 0,11-1,904 around the coal yard D5: 0,11-0,50 piezometers around oil tanks TPP A: 0,11-3,31 piezometer around gas station OCM Drmno: 1,03-2,281
Copper (µg/l)	2000	75	in piezometers around cassette B ranging: 20-39 in piezometers around cassette C ranging: < 20 in piezometers around the Cirikovac ash landfill: <20 piezometers away from the SKO landfill: < 20 around the coal yard D5: < 20 piezometers around oil tanks TPP A : < 20 piezometer around gas station OCM Drmno: <20
Cadmium (µg/l)	3	6	in piezometers around cassette B ranging: 0,4-1,0 in piezometers around cassette C ranging: 0,4-3,4 in piezometers around the Cirikovac ash landfill: 0,4-5,0 piezometers away from the SKO landfill: 0,4-0,7 around the coal yard D5: 0,4-1,5 piezometers around oil tanks TPP A : 0,4-1,5 piezometer around gas station OCM Drmno: <0,4
Lead (µg/l)	10	75	in piezometers around cassette B ranging: 10-20 in piezometers around cassette C ranging: 10-39 in piezometers around the Cirikovac ash landfill: 10-13 piezometers away from the SKO landfill: 10-29 around the coal yard D5: 10-30 piezometers around oil tanks TPP A :10-30 piezometer around gas station OCM Drmno: 10-32
Mercury (µg/l)	1	0,3	in piezometers around cassette B ranging: < 0,3 in piezometers around cassette C ranging: <0,3 in piezometers around the Cirikovac ash landfill: <0,3 piezometers away from the SKO landfill: <0,3 around the coal yard D5: < 0,3 piezometers around oil tanks TPP A : <0,3 piezometer around gas station OCM Drmno: 0,3-0,6
Mineral oil (µg/l)		600	in piezometers around cassette B ranging: <10 in piezometers around cassette C ranging: 10-27 in piezometers around the Cirikovac ash landfill: 10-68 piezometers away from the SKO landfill: 10-210 around the coal yard D5: <10 piezometers around oil tanks TPP A : <10 piezometer around gas station OCM Drmno: 10-80

MPC – drinking water;

RV - Remediation values of hazardous and harmful substances concentration and values indicating severe groundwater contamination.

Legal compliance is evaluated by comparing the groundwater measured values of hazardous and harmful substances concentration from piezometers, remediation values of hazardous and harmful substances concentration and values indicating severe groundwater contamination in line with the

Regulation on Limit Values for Polluting, Harmful and Hazardous Substances in the Soil (OG RS № 30/2018 and 64/2019) pursuant to the Law on Soil Protection.

Table 79 provides analysis of data related to sanitary waste water quality at the inlet and outlet of the newly built plant for treatment (SBR), for 2021.

Table 79

Kostolac TPPs Branch	
Sanitary wastewater treatment plant operation in 2021	
Pollutants concentration (mg/l)	BIODISK plant Kostolac B TPP
Suspended solids (mg/l)	
Plant inlet	71,40
Plant outlet	4,05
5-day biological oxygen demand (BOD₅)	
Plant inlet	19,75
Plant outlet	1,61
Operation efficiency evaluation	Meeting guaranteed values for suspended solids for all measurements

Emission values for BOD and suspended solids are within allowable limits, based on the Regulation on Emission Limit Values of Pollutants in Water and deadlines for reaching them.

According to the instructions provided by the manufacturer, the primary sedimentation tanks should be emptied once a year, and all devices should be regularly maintained and overhauled.

▪ Water amounts

Table 80 provides an overview of water amounts captured and discharged per the organizational units of TPPs Kostolac Branch for 2021.

Table 80

TPPs Kostolac Branch					
Water amounts in 2021 (m ³ /year x10 ³)					
Organizational unit	Water intake		Discharged wastewater		
	Used amounts		Return cooling water	Overflow and drainage water from the ash landfill	Sanitary wastewater
	Surface	Ground*			
KOSTOLAC A TPP	351.798	-	338.589	3.781	75
KOSTOLAC B TPP	750.100	778	738.629	2.224	231**
TOTAL: Kostolac OCMs and TPPs Branch	1.101.898	778	1.077.218	6.005	306

* for the purposes of technical and potable water preparation

**purified water

For the purposes of hydro mixture transportation from TPP Kostolac A and TPP Kostolac B to Cirikovac ash landfill, part of return cooling water is used and returned by recirculation.

Annual amount is calculated on the basis of data on the capacity and water capture and discharge pumps operating time. In cases of gravitational wastewater discharge calculations are made on the basis of previously measured wastewater amounts.

▪ Improvements aimed at reducing wastewater impacts on surface and groundwater

A new ash and slag handling system at Kostolac A TPP was put in operation during 2019. Upon system commissioning, new system performances were tested.

Ash and slag were disposed to the Srednje Kostolacko Ostrvo landfill. Commissioning of the new system (thick slurry transportation) Kostolac A TPP moved to ash and slag disposal to ash and slag landfill of Cirikovac OCM. The Srednje Kostolacko Ostrvo landfill serves as back-up until the phase of its shutdown.

Kostolac B TPP units were connected to the new thick slurry collection, transportation and disposal system. Ash and slag are disposed to the Cirikovac OCM. Thick slurry transportation system is of recirculation type, because water serves to transport ash and slurry and circulates the system.

During 2021, in the course of flue-gas desulphurisation trial operation, an inspection of this facility waste water was carried out in accordance with Regulation on Emission Limit Values of Pollutants in Water and deadlines for reaching them, after flue-gas desulphurisation, before mixing it with acid-alkaline water from a plant for treatment of these wastewaters. A temporary solution for the discharge of this wastewater is discharge it into the pumping station until the construction of wastewater treatment facility is finalized

During 2020, the construction of TPP Kostolac B Wastewater Treatment Facility has commenced. Previously the construction permit was issued by the Ministry of Construction, Transport and Infrastructure no. 351-02-00028/2019 as of 16th April 2019, as well as the Decision of the Ministry of Environmental Protection on the approval on the updated Environmental Impact Assessment Study for the Wastewater Treatment Facility (no.353-02-00252/2019-03 as of 11th July 2019).

At the location of TPP Kostolac B, the Project "Construction of a wastewater treatment plant" is in the final phase. The decentralized wastewater treatment system consists of three major plants:

1. Sanitary wastewater treatment plant;
2. Oily and fuel oily wastewater treatment plant, with the capacity of 2x 30m³/h;
3. Wastewater treatment plant from flue gas desulphurisation and acid-alkaline water from a chemical water treatment plant, with the capacity of 2 x 45m³/h.

The sanitary wastewater treatment plant was built in 2020 and put into trial operation. In 2021 231.041 m³ of purified sanitary wastewater was discharged into the river Mlava.

Oily and fuel oily wastewater treatment plant was finished and put into trial operation in 2021. In this plant 94.059 m³ of water was purified.

The plant for purification of wastewater from desulphurization of flue gases and acid-alkaline water from the facility Chemical preparation of water is in the final phase of commissioning and optimization of the technical process is being carried out.

Within the mentioned Project, the construction of 4 oil separators is planned, which are to be installed on the atmospheric sewage.

4.2.4. Emission Measurements of Matters Affecting Soil Quality

Based on the Law of Soil Protection (OG RS № 112/2015), and the Rulebook on the list of activities that may be the cause of soil pollution and degradation, procedure, data content, deadlines and other requirements for land monitoring, the testing of soil quality is performed once every 5 years, given that according to the soil test report the remediation values laid down by the Rulebook are not exceeded.

In accordance with the Environmental Impact Assessment Study of the OCM "Drmno" for coal exploitation in Kostolac with the capacity of 9 million tons per year, in 2022, it is planned to perform the testing of the soil quality at 72 measuring points. In the course of this sampling it is compulsory to also perform the analysis of the recipients and monitoring of the impact soil makes on them. Soil testing, performed by an authorized person includes: field and laboratory measurements on representative measuring points shown on the topographic map (GPS identified points), allowing the monitoring of parameter changes on these measuring points in the future. Measuring points are defined depending on the distance from the landfill:

- landfill (ash)
- inside the impact zone as follows:
 - Zone 1 - up to 1km from the landfill,
 - Zone 2 - from 1km to 3km from the landfill and
 - Zone 3 - from 3km to 5km from landfill
- outside the landfill zone (checkpoints).

Annual report on the management of landfill ash and slag impact on soil is submitted to the Environmental Protection Agency. The results of soil quality testing are provided in the Report on Environmental State for the relevant year per each organisational unit. Apart from that, this data is

also presented in the National Pollution Sources Registry delivered by PE EPS each year to the Environmental Protection Agency in line with the legal.

During 2021 no testing of soil quality was performed. Plan and Program of the environment monitoring in TPP Kostolac Branch includes the impact monitoring of the operation of TPP Kostolac Branch which is performed every other year, so the quality testing is planned for 2022.

4.2.5. Environmental Noise Measurements

When it comes to the area that belongs to this Branch, in 2021 noise measurements were performed at six measuring points in accordance with the Noise Protection Act (OG RS № 96/21), Rules stipulating noise measurement methodology, the content and form of noise measurement reports (OG RS № 72/2010) and the Rules stipulating noise indicators, limits, methods for evaluating noise indicators, disturbance and harmful environmental noise effects (OG RS № 75/2010). Noise measurement at the locations of thermal power plants was carried out by an authorized legal entity at 6 measurement points, which was presented in the Report for open-cast mines.

Measurements were carried out on the following measuring points:

1. TPP Kostolac B – the village of Drmno
2. TPP Kostolac B - entrance to the Crushing plant
3. TPP Kostolac B – the lake
4. TPP Kostolac A – “Prim“ Kostolac
5. TPP Kostolac A – FIO Minel
6. TPP Kostolac A – the port

Table 81 the data related to the shows the measured environmental noise levels in 2021 for the TPP Kostolac Branch (organisational unit Thermal Power Plant Kostolac A and Thermal Power Plant Kostolac B), during the summer period.

In the course of noise measuring, the units operated at full capacity (TPP A1 – 100MW; A2 - 210 MW; B1 - 348,5 MW; B2 - 348,5 MW).

Local government of city municipalities of Kostolac and Pozarevac did not perform acoustic zoning in accordance with the Noise Protection Act (OG RS № 96/21).

Due to the lack of clearly limited acoustic zones, measuring points cannot be precisely determined, as well as the limits for these measuring points. For this reason, legal compliance of the TPP Kostolac Branch. The noise measuring results do not exceed the maximum allowable emission limit values (ELV) which are 65 dB during the day and 55 dB during the night, bearing in mind that the local government did not perform the acousting zoning.

Table 81

TPP-OCMs Kostolac Branch						
Noise levels in 2021 (dB) (A)						
Measuring point	I measuring – winter					
	TPP Kostolac B			TPP Kostolac A		
	the village of Drmno	entrance to the Crushing plant	The lake	“Prim“ Kostolac	FIO Minel	the port
day	58,0	60,9	53,3	51,2	45,6	47,4
day	60,5	57,9	59,6	58,2	46,9	48,3
evening	62,0	57,7	49,7	57,7	49,6	51,7
night	61,8	61,3	53,8	56,4	49,1	51,9
night	61,5	61,2	55,4	56,4	51,8	51,2

In the upcoming period, the Study of Noise Reduction in Environment will be prepared for TPP and CHPP.

4.2.6. Waste

Table 82 shows waste production in 2021 for TPP Kostolac Branch (parts of the Branch: TPP Kostolac A and Kostolac B).

Table 83 shows quantities of waste that was delivered in 2021 by the TPP Kostolac Branch parts of the Branch: TPP Kostolac A and Kostolac B).

In accordance with Waste Management Law, the Ministry of Environmental Protection has issued a certificate to TPP Kostolac Branch for registering the REA-gypsum in the by-products registry, for the amounts that were negotiated to be sold through a relevant contract. TPP Kostolac Branch je is the first commercial entity in Serbia that has registered REA-gypsum in the by-product registry.

During 2021 the registration of the by-product was performed and the Certificate of by-product registration was issued for amount the client has requested, namely, NUS-1 in the amount of 10 000 t (ten thousand tons), NUS-2 in the amount of 70 000 t (seventy thousand tons) and NUS - 3 in the amount of 400 000 t (four hundred thousand tons).

Table 82

TPP Kostolac Branch						
Waste generated in 2021 (t)						
SN	Rulebook waste categories, its testing and classification (OG RS № 56/2010, 93/2019 and 39/2021)	Index number	Organisational unit			Note
	Name		TPP Kostolac A	TPP Kostolac B	TOTAL (t)	
1.	Waste printer cartridges other than the ones indicated under 08 03 17	08 03 18	0,025	0,000	0,025	
2.	Fly ash from coal	10 01 02	574.765,400	1.097.418,200	1.672.183,600	-
3.	Solid waste based on calcium in the process of flue gas desulphurization	10 01 05	-	161.035,02	161.035,02	Gypsum
4.	Mineral non-chlorinated hydraulic oil	13 01 10*	1,895	6,370	8,265	-
5.	Mineral non-chlorinated motor oils, gearbox oils and lubricating oils	13 02 05*	0,000	0,360	0,360	
6.	Other emulsions	13 08 02*	0,869	0,000	0,869	Oil, water, grease, soil
7.	Packaging containing residues of hazardous substances or contaminated by hazardous substances	15 01 10*	1,130	1,316	2.446	Hydrazine packing
			0,000	0,820	0,820	Oil packing
8.	Absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing, contaminated with hazardous substances	15 02 02*	0,140	0,160	0,300	Cotton
9.	Waste tires	16 01 03	0,000	0,700	0,700	vehicle tires
10.	Slate and ceramics	17 01 03	0,900	0,000	0,900	
11.	Glass	17 02 02	0,000	0,008	0,008	
12.	Plastic	17 02 03	0,183	0,450	0,633	
13.	Copper, bronze, brass	17 04 01	9,200	0,00	9,200	copper
			5,000	0,00	5,000	
14.	Aluminum	17 04 02	0,050	0,00	0,050	-
15.	Iron and steel	17 04 05	335,722	218,74	554,462	Various thickness
			160,620	685,38	846,00	Impact plates and billets
16.	Cables different than those stated in 17 04 10	17 04 11	0,080	0,300	0,380	-
17.	Insulation material different than those stated in 17 06 01 and 17 06 03	17 06 04	243,500	174,24	417,74	Mineral wool
			13,231	0,000	13,231	Preinsulation pipes
18.	Saturated or exhausted ion exchange resins	19 09 05	13,400	31,840	45,24	
19.	Fluorescent tubes and other waste containing mercury	20 01 21*	0,300	0,000	0,300	-



TPP Kostolac Branch						
Waste generated in 2021 (t)						
SN	Rulebook waste categories, its testing and classification (OG RS № 56/2010, 93/2019 and 39/2021)	Index number	Organisational unit			Note
	Name		TPP Kostolac A	TPP Kostolac B	TOTAL (t)	
20.	Discarded electrical and electronic equipment other than the one indicated under 20 01 21 and 20 01 23 which contains dangerous components	20 01 35*	1,119	2,070	3,189	Electric, electronic waste
21.	Bulk waste	20 03 07	0,090	0,000	0,090	

Table 83

TPP Kostolac Branch						
Waste delivered in 2021						
SN	Rulebook waste categories, its testing and classification (OG RS № 56/2010, 93/2019 and 39/2021)	Index number	Organisational unit			Note
	Name		TPP Kostolac A	TPP Kostolac B	Total (t)	
1.	Fly ash from coal	10 01 02	-	17.458,060	17.458,060	Sale with financial compensation
2.	Solid waste based on calcium in the process of FGD	10 01 05	-	96.290,410	96.290,410	Sale with financial compensation
3.	Mineral non-chlorinated hydraulic oil	13 01 10*	1,895	0,980	2,875	Service providing contract related to waste disposal
4.	Other emulsions	13 08 02 *	0,684	0,000	0,684	Sale with financial compensation
5.	Packaging containing residues of hazardous substances or contaminated by hazardous substances	15 01 10*	1,540	2,776	4,316	Hydrazine barrels - Service providing contract related to waste disposal
		15 01 10 *	0,000	0,820	0,820	Hydrazine barrels - Service providing contract related to waste disposal
6.	Absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing, contaminated with hazardous substances	15 02 02*	0,240	0,160	0,400	Service providing contract related to waste disposal
7.	Iron and steel	17 04 05	46,520	219,00	265,520	Various thickness. Sale with financial compensation
		17 04 05	160,620	685,380	846,00	Impact plates. Sale with financial compensation
8.	Insulation mterial different than those stated in 17 06 01 and 17 06 03	17 06 04	311,380	274,52	585,900	Mineral wool - Service providing contract related to waste disposal
		17 06 04	46,580	0,000	46,580	Preinsulation pipes - Service providing contract related to waste disposal



TPP Kostolac Branch						
Waste delivered in 2021						
SN	Rulebook waste categories, its testing and classification (OG RS № 56/2010, 93/2019 and 39/2021)	Index number	Organisational unit			
	Name		TPP Kostolac A	TPP Kostolac B	Total (t)	Note
9.	Saturated or exhausted ion exchange resins	19 09 05	6,400	31,84	38,240	Service providing contract related to waste disposal
10.	Fluorescent tubes and mercury-containing waste	20 01 21*	0,500	0,500	1,000	Service providing contract related to waste disposal
11.	Discarded electrical and electronic equipment other than the one indicated under 20 01 21 and 20 01 23 which contains dangerous components	20 01 35*	0,500	2,040	2,540	Service providing contract related to waste disposal

4.3. Working Environment Monitoring, Occupational Health and Safety

Occupational Safety and Health Reports for 2021 include the following elements:

- **Working environment monitoring**
 - working environment noise measurements
- **Safety**
 - training of employees
 - work injuries
- **Health**

4.3.1. Working Environment Monitoring

- **Working environment noise measurements**

In 2021 in TPP Kostolac A working environment conditions tests were not performed, i.e. working environment noise measurements were not performed. In 2021 in TPP Kostolac B periodic inspections of working environment were performed at 3 work posts. Measurements were performed for the following working environment parameters:

- microclimate in winter period (temperature, relative humidity, flow rate), physical and chemical hazards.

Noise measurements were performed in TPP Kostolac B in 2021 at 3 work posts. Measured values of the equivalent level of sound pressure do not exceed allowable limit values of maximum allowable equivalent sound pressure levels, for uninterrupted work. Standard occupational health and safety measures were applied.

4.3.2. Occupational Safety

- **Training**

Employees are trained according to the Health and Safety Training Programme in PE „Elektroprivreda Srbije“ and in accordance with the procedures of the Health and safety management system, according to the requirements of ISO 45001 standard. Testing of occupational safety competence and knowledge is carried out minimum once a year in compliance with the Risk Assessment Act of TPP Kostolac Branch and Occupational Health and Safety Act. According to Occupational Health and Safety Act training within Kostolac TPP is performed whenever new workers are recruited, deployed to new workplaces, in the process of technological changes and the introduction of new equipment and work tools. Revision and knowledge tests were conducted for the employees working at high risk posts. Table 84 shows the number of employees foreseen for training and the number of trained employees in 2021.

Table 84

TPP Kostolac Branch					
Training in 2021					
Organizational unit	Number of employees	Foreseen for training		Trained	
		No.	%	No.	%
TPP Kostolac A	355	291	81,97	291	100,00
TPP Kostolac B	391	272	69,57	272	100,00
TOTAL: TPP KOSTOLAC BRANCH	746	563	75,47	563	100,00
▪ TOTAL: TPP KOSTOLAC BRANCH	746	563	75,47	563	100,00

Note: Some workers went through more than one training, for example due to relocation to other jobs or as a post injury measure.

- **Work injuries**

Table 85 provides work injuries data for 2021.

Table 85

TPP Kostolac Branch						
Training in 2021						
Organizational unit	Number of employees	Injuries – Number of employees' ratio				
		Light	Serious	Fatalities	Total	%
TPP Kosotlac A	355	0	1	0	1	0,28
TPP Kostolac B	391	0	0	0	0	0,00
TOTAL: TPP-OCMs KOSTOLAC BRANCH	746	0	1	0	1	0,13

4.3.3. Health Protection

All employees at Kostolac TPPs undergo pre-employment and periodic medical examinations. Workers are directed to pre-employment medical examinations before they are hired and when they are deployed to a different workplace that has a higher risk factor. Employees working at high risk posts are directed to periodic medical examinations once a year. Periodic examinations in 2021 were performed at Occupational healthcare center Pozarevac. Table 86 provides periodic examination data verifying the work capability of employees in 2021.

Table 86

TPP Kostolac Branch											
Work capability in 2021											
Organizational unit	Number of employees	Periodical examinations				Work capability					
		Referred to examination		Examined		Capable		Limited capability		Not capable	
		No.	%	No.	%	No.	%	No.	%	No.	%
TPP Kosotlac A	355	291	81,97	288	98,97	267	92,71	20	6,94	1	0,35
TPP Kostolac B	391	272	69,57	266	97,79	250	93,98	16	6,02	0	0,00
TOTAL: TPP-OCMs KOSTOLAC BRANCH	746	563	75,47	554	98,40	517	93,32	36	6,50	1	0,18

4.4. Public Submissions

Public submissions in 2021 are shown in the Table 87.

Table 87

TPP Kostolac Branch		
PUBLIC SUBMISSIONS IN 2021		
Organizational unit	Submission (made by)	Subject of submission Measures taken
TPP Kostolac A TPP Kostolac B	Complaint by the citizens of Klenovik village Complaint made by a natural person	Acting upon a submission made by a natural person from Klenovnik, in accordance with the Law on Environmental Noise Protection (OG RS № 36/2009 and 88/2010), Rules stipulating noise measurement methodology, the content and form of noise measurement reports (OG RS № 72/2010) and Rules stipulating noise indicators, limits, methods for evaluating noise indicators, disturbance and harmful environmental noise effects (OG RS № 75/2010), the Republic inspector of Environmental protection, issued a Decision no. 910-480-501-00043/2020-04 dated 13 th January 2021, whereby ordering TPP Kostolac, to hire an authorized person to perform measuring of noise created due to mining and construction activities carried out at Ćirikovac ash and slag disposal site, in the impact zone On 21 st January 2021, registered under the number 0501-35883/1-2021 TPP Kostolac Branch submitted a request to the Ministry of Environmental Protection, specifically a Republic Inspector for Environmental Protection in the Sector for Environmental Monitoring and Precaution, whereby asking for the extension of the deadline for acting upon the aforementioned Decision, stating that all works on the construction of the embankment have been suspended due to poor weather conditions. On 23 rd March 2021, registered under the number 0501-158152/1-2021, TPP Kostolac Branch submitted a Noise Measurement Report, performed in accordance with the Decision 910-480-501-00043/2020-04 from 13 th January 2021. The noise measurement was performed on 24 th February 2021. by the authorized public entity MIPHEM, Belgrade, during three time periods. In the course of environmental noise measurement, it was determined that the noise levels DO NOT EXCEED allowable limit values for the outside noise during the day and night at the location in question.

5. PANONSKE CHPPS BRANCH

Panonske CHPPs Branch comprises the following organizational units:

- **Novi Sad CHPP**
- **Zrenjanin CHPP and**
- **Sremska Mitrovica CHPP.**

5.1. Overview and Status of Permits

Overview and status of permits for 2021 are in Table 88.

Table 88

PANONSKE CHPPS BRANCH			
Overview and Status of Permits for 2021			
Organizational unit	Obtained permits and approvals (number and date)	New requestes for obtaining or extension of valid permits	Note
NOVI SAD CHPP	-		
ZRENJANIN CHPP	-		
SREMSKA MITROVICA CHPP	Decision on the use permit for the adapted hot water boiler plant (biomass boiler): installation of an 18 MW biomass boiler - sunflower husk with fuel storage and delivery system - biomass and flue gas purification system and boiler room building adaptation, floors G+1. Provincial Secretariat for Energy, Construction and Transport, number: 143-351-330 / 2021 ROP-PSUGZ-4919-IUPH-2/2021 from July 13 rd , 2021 Decision on the Water Permit of the Provincial Secretariat for Agriculture, Water Management and Forestry, number: 104-325-215 / 2019-04 from July 30 th , 2021	-	-

5.2. Monitoring and Environmental Impact

5.2.1. Air Quality Measurements

Air quality monitoring in the vicinity of the Panonske CHPPs Branch organizational units is carried out as part of the monitoring financed and organized by individual organizational units (as requested by inspection). It should be noted that the air quality monitoring is within the competence of the competent authorities, public administration and authorized legal entities; therefore, air quality monitoring is carried out as part of the national automatic air quality monitoring network, comprising measuring points located in the vicinity of CHPP within Panonske CHPPs Branch.

Monthly and annual air quality reports in the vicinity of the Panonske CHPPs organisational units (when there are measurements) are made available to the local government and public administration upon request.

Novi Sad CHPP

No air quality measurements have been carried out in 2021.

Zrenjanin CHPP

No air quality measurements have been carried out in Zrenjanin CHPP since 2011.

Sremska Mitrovica CHPP

No air quality measurements in 2021.

5.2.2. Emission Measurements of Matters Affecting Air Quality

Flue gases containing sulphur dioxide, nitrogen oxides and dust are emitted through stacks:

- 160m – Novi Sad CHPP
- 160m - Zrenjanin CHPP
- Sremska Mitrovica CHPP
 1. 105 m, concrete stack,
 2. 77,5 m, brick stack, and

Auxiliary boiler room Sremska Mitrovica CHPP (3 boilers, each having its own stack – total 3 small metal stacks).

- 2 metal stacks - 7 m,
- 1 metal stack - 4.7 m.

In accordance with the legislation individual measurements of air pollutants are performed regularly, control measurements as required. Continuous measurements are carried out on boilers of Panonske CHPPs Branch organizational units only for the purpose of internal monitoring. Organizational unit CHPP Novi Sad obtained the consent issued by the competent authority to carry out individual continuous measurements of the emissions of sulfur dioxide, nitrogen oxides, carbon monoxide and particulate matter by the Decision of Ministry for Environmental Protection, number 353-01-00293/2019-03 from September 19th, 2019.

▪ Individual emissions measurements of matters affecting air quality

Emissions of air pollutants for 2021 are given for each CHP individually based on measurements performed by an authorized legal entity "Institute for Occupational Safety", Novi Sad, in line with the Individual Air Emission Measurement programme. The programme includes measurement of flue gas condition (temperature, pressure and humidity), volume flow, oxygen content, as well as mass concentration and calculation of emission factors for sulfur dioxide (SO₂), nitrogen oxides (NO_x), carbon monoxide (CO), and particulate matters. Since 2019, Novi Sad CHPPs has been independently performing continuous measurements of air emissions and, in accordance with that, has not performed occasional measurements.

Table 89. summarizes the results of individual measurements of matters emissions affecting air quality for the Panonske CHPPs Branch conducted in 2021.

Table 89

PANONSKE CHPPs BRANCH		
Individual air emission measurements that impact on air quality in 2021		
Novi Sad CHPP		
Unit	A1 (B1 and B2)	A2 (B3)
Heat output	2x279 MWth	320 MWth
Heat output at stack	878 MWth	
Fuel	Gas	
SO ₂	-	-
NO _x (NO ₂)	-	-
CO	-	-
Particulate matter	-	-
Zrenjanin CHPP		
Unit	A1 (B1 and B2)	A2 – out of function
Heat output	2x250 MWth	
Heat output at stack	Gas	-
Fuel	-	-
SO ₂	-	-
NO _x (NO ₂)	-	-
CO	-	-
Sremska Mitrovica CHPP		

PANONSKE CHPPs BRANCH				
Individual air emission measurements that impact on air quality in 2021				
Unit	A3(B3 and B4)		Auxilliary Boiler Room	Biomass boiler TEK - 405
Heat output	2x80 MWth		3x15 MWth	18 MWth
Heat output at stack	Gas	Crude oil	Gas	Sunflower husk
Fuel				
SO ₂			0	3,10
NO _x (NO ₂)			0	66,53
CO			144,60	544,40
Particulate matter			-	7,89

Boilers 2 and 3 in Novi Sad CHPP fired natural gas during the entire 2021. In 2021, there were no air-pollutant emission measurements in Zrenjanin CHPP because the generation unit was not operating. The generation unit – Unit 2 has not been operating since 1st November 2010.

The last emission measurement in Zrenjanin CHPP was done on boiler B1, with heat output of 250 MW, Unit A1, in 2012. Since 2012, Unit A1 has not been operated by EPS. For heating purposes of the Zrenjanin CHPP facilities, the boiler T110 is used, with heat output of 8.5 MW, which fired the gas during the heating season in 2021. The average heat output used to heat own facilities with gas is approximately 500 kW.

In 2021, in the Sremska Mitrovica CHPP, one boiler firing biomass TE.K – 405 (sunflower husk) operated for 2,816 hours, while the boiler S-2400/2 in the auxiliary boiler room fired only natural gas for 986 hours. Unit A3 was not in operation. Steam boilers S-2400/1 and S-2400/3 fired natural gas less than 100 hours in 2021.

Continuous emissions measurements of matters affecting air quality

In addition to the basic equipment consisting of analyzers measuring mass concentrations of dust and gases, the additional equipment was also installed on stacks measuring oxygen, carbon dioxide and humidity content as well as temperature, pressure and flue gas flow rate, SO₂, CO, NO₂, NO_x, HCl, HF. Data acquisition and processing equipment was also installed.

Table 90 provides an overview of data on equipment for continuous emissions measurement of matters affecting air quality in Panonske CHPPs Branch.

Table 90

PANONSKE CHPPs BRANCH							
Continuous emission measurement equipment of units in 2021							
Organisational unit	Particulate matters	Pollutants		Parameters			
		Gases		Content			
		SO ₂ , NO _x (NO ₂), CO	HCl and HF	Humidity	CO ₂	O ₂	p
NOVI SAD CHPP	1 analyzer	1 analyzer	1 analyzer each			1 gauge each	
	Measuring equipment is installed at the elevation of 41.8 m, on the external stack lining. The platform is at the elevation of 40.0 m, on the external stack lining. Stack height is 160 m.						
ZRENJANIN CHPP	1 analyzer	1 analyzer	1 analyzer each			1 gauge each	
	Measuring equipment is installed at the elevation of 38 m, on the external stack lining. The platform is at the elevation of 37.0 m, on the external stack lining. Stack height is 160 m.						
SREMSKA MITROVICA CHPP	1 device each					1 device each	
	The devices are installed in the horizontal rectangular flue duct of the biomass boiler TE.K – 405, connected to the brick stack 77.5 m high.						

Continuous measurements are in accordance with EN 14181 - QAL1. The software for statistical analysis of continuous measurements data assumes preparation of daily, monthly and annual reports.

Table 91 provides an overview of air emissions continuous measurements results for which ELVs for Novi Sad CHPP are set, in 2021.

Table 91

PANONSKE CHPPS BRANCH				
Continuous emissions measurements of matters affecting air quality in 2021 (mg/Nm ³)				
Organisational unit	Particulate matter	SO ₂	CO	NO _x (NO ₂)
Novi Sad CHPP	1,065	1,20	27,90	381,80

▪ Annual emissions of pollutants affecting air quality

Table 92 provides an overview of emissions affecting air quality: particulate matters, SO₂, NO₂ and CO₂ for the Panonske CHPPs Branch in 2021. Annual particulate matter, SO₂ and NO₂ emissions were calculated based on the measured mass concentrations, flue gas flow rate and operating time of units, while CO₂ emissions were calculated based on the fuel consumption data shown in Table 93 and CEF – correction emission factor.

Table 92

PANONSKE CHPPS BRANCH				
Emission of matters affecting air quality in 2021 (t/year)				
Organisational units	Particulate matter	SO ₂	NO _x (NO ₂)	CO ₂
NOVI SAD CHPP				
STACK, BOTH UNITS –CONTINUOUS MEASUREMENT	3,2326	3,5608	1.154,6223	425.955,86
TOTAL: NOVI SAD CHPP	3,2326	3,5608	1.154,6223	425.955,86
ZRENJANIN CHPP				
UNIT A1	0,000	0,000	0,000	0,000
UNIT A2	0,000	0,000	0,000	0,000
TOTAL: ZRENJANIN CHPP	0,000	0,000	0,000	0,000
SREMSKA MITROVICA CHPP				
UNIT A3, B3/B4	0,000	0,000	0,000	0,000
S-2400/1	0,000	0,000	0,000	32,14
S-2400/2	0,000	0,000	2,073	1.856,70
S-2400/3	0,000	0,000	0,000	0,000
Biomass-fired boiler	0,787	0,306	52,489	172,33*
TOTAL: SREMSKA MITROVICA CHPP	0,787	0,306	54,562	2.061,17
TOTAL: PANONSKE CHPPs	4,0196	3,8668	1.209,1843	428.017, 03

* The CO₂ emission value is a result of natural gas consumption in the biomass-fired boiler

Table 93

PANONSKE CHPPs BRANCH			
Fuel consumption in 2021			
Organisational unit	Fuel type		
	Gas (kStm ³ /god)	Heavy fuel oil (kt/god)	Biomass (kt/god)
NOVI SAD CHPP			
STACK, BOTH UNITS-CONTINUOUS MEASUREMENT	228.896,477	0,000	0,000
Total: NOVI SAD CHPP	228.896,477	0,000	0,000
ZRENJANIN CHPP			
Unit A1	0,000	0,000	0,000
Unit A2	200,638*	0,000	0,000
Total: ZRENJANIN CHPP	200,638*	0,000	0,000
SREMSKA MITROVICA CHPP			
Unit A3, K3/K4	0,000	0,000	0,000
S-2400/1	17,273	0,000	0,000
S-2400/2	997,737	0,000	0,000
S-2400/3	0,000	0,000	0,000
Biomass boiler	92,605	0,000	5,833
Total: SREMSKA MITROVICA CHPP	1.107,615	0,000	5.833
Total: PANONSKE CHPPs	230.204,73	0,000	5.833

*Fuel consumption for heating the personal facilities

▪ Harmonization of air emissions with EU legislation

Sulphur dioxide

To reduce the Panonske CHPPs SO₂ emissions, the use of heavy fuel oil with Sulphur content of up to 1% was planned together with the combined cycle operation – gas/heavy fuel oil.

Novi Sad CHPP

Heat output of boilers is 2x279 MW and 1x320MW, whereby when one boiler fires heavy fuel oil with Sulphur content up to 1% ELVs will not be exceeded which is in line with EU legislation.

Zrenjanin CHPP

Heat output of the boiler is 2x250MW, whereby when one boiler fires heavy fuel oil with Sulphur content up to 1% ELVs will not be exceeded which is in line with EU legislation.

Sremska Mitrovica CHPP

Heat output of the boiler and auxiliary boiler are 2x80MW and 3x15MW respectively. When one boiler fires heavy fuel oil with Sulphur content up to 1% ELVs will not be exceeded which is in line with EU legislation. There is also an 18MW biomass-fired boiler where an authorized legal entity measured low SO₂ emission during its operation which is below proposed ELV.

Nitrogen oxides

Novi Sad CHPP, Zrenjanin CHPP and Sremska Mitrovica CHPP

In order to reduce the content of nitrogen oxides, the study is planned: "Conceptual solution for reducing the content of nitrogen oxides in the steam boiler TGM-84 / B" and "Feasibility study with the preliminary design for reducing the NO_x content in the boiler TGME 464 / C" in Novi Sad CHPP.

5.2.3. Emission Measurements of Matters Affecting Water Quality

Measurement of emissions that affected water quality in 2021 are provided for every CHPP separately, based on research done by authorized legal entitie Vatrogas Institute - Novi Sad.

Novi Sad CHPP

Highest consumption of process water in Novi Sad CHPP is the water for steam cooling in condensers, there is a circulating cooling system, while water is supplied from the Danube. Return cooling water and all other industrial wastewater (water from the demineralization process and oily water after primary and secondary treatment) is after treatment discharged into the Danube. A small share of water is used to produce demineralized and soft water.

Sanitary-sewage water is from November 2012 discharged into the city wastewater collector. Storm drainage is from November 2012 discharged into the city wastewater collector. The Danube water belongs to Class II.

Wastewater quality and its Danube impact is controlled 4 times a year pursuant to the Law on Water. Novi Sad CHPP wastewater is discharged over three outlets:

- Storm drainage;
- Sanitary-sewage water system. From 2013, quality of this water is not controlled, given that it is discharged into the city wastewater collector;
- Cooling water channel.

Monitoring programme includes the following physical-chemical parameters: temperature, pH, turbidity, ammonia, inorganic nitrogen, cyanides, suspended substances, dissolved oxygen, COD, BOD₅, total phosphorus, mineral oils, Pb, Cd, Cu, Cr, Ni and Zn.

Wastewater sampling is performed on 7 measuring points, as follows:

1. Storm drainage – last manhole inside the Novi Sad CHPP grounds;
2. Return cooling and process water – Danube discharge point
3. Danube water - 100m downstream from the cooling water discharge;

4. Danube water - 100m upstream from the cooling water discharge;
5. Neutralisation basin;
6. Oily water at the oily water treatment plant inlet – primary treatment;
7. Oily water after secondary treatment (carbon filters).

In 2021 wastewater quality was controlled on 4 occasions.

Zrenjanin CHPP

Water used for condenser water vapour cooling has the highest share in the total amount of process water used by the Zrenjanin CHPP. Zrenjanin CHPP cooling water system is of the recirculation type including a turbine condenser, cooling towers, cooling water pumps, pipes and valves. Decarbonized water is used as an operating fluid by the cooling water system. Begej River water is used to produce demineralized and decarbonized water.

Wastewater (from boiler chemical cleaning, cleaning and passivation of water channels and oily water) is discharged after treatment into the Aleksandrovac channel and subsequently into the Begej River. Aleksandrovac channel belongs to Category IV, while the Begej River water belongs to Category II.

Decarbonisation and clarification processes wastewater is fed back to the process while the resulting sludge cake is transported and disposed at the landfill.

Acid-alkaline water originating from the demineralization process is neutralized and discharged into the Aleksandrovac channel. Acid-alkaline wastewater from regenerative air heater washing is processed (neutralization and sedimentation) and returned to the process as filtrate.

Oily wastewater is also treated (through carbon-anthracite filters) and subsequently discharged into the Aleksandrovac channel.

Sanitary-sewage water is after mechanical-biological treatment by the PUTOX plant discharged over a special channel into the Aleksandrovac channel.

Zrenjanin CHPP wastewater quality and its water recipient impact is controlled 4 times a year. Sampling of wastewater and water from Aleksandrovac channel is performed on 5 measuring points, as follows:

- Sanitary-sewage water (PUTOX) – before treatment and after treatment
- Neutralization pit,
- Aleksandrovac channel before discharge,
- Aleksandrovac channel after discharge,
- Oily water – before inlet in the treatment plant and at the outlet of the treatment plant.

After all measurements performed during the year, an authorized legal entity issues a certificate for the efficiency of the wastewater treatment plant operation (PUTOX) and oily and oily water treatment plants operation.

Monitoring programme includes the following physical-chemical parameters: temperature, pH, electrical conductivity, dissolved oxygen, turbidity, suspended substances, sedimentary matter, alkalinity, acidity, COD, BOD₅, permanganate demand, chloride demand, total nitrogen, total phosphorus, ammonia, nitrites, nitrates, phosphates, sulphates, phenol index, hardness, grease and oil. Sampling was conducted within the Zrenjanin CHPP grounds, Aleksandrovac channel.

IN 2021 wastewater quality was controlled on 4 occasions, expect the control of oil water quality, which was performed on 3 occasions since there was no oil water in the final quarter.

Sremska Mitrovica CHPP

Water used for T/G 32 MW turbine condenser cooling has the highest share in the total amount of process water used by the Sremska Mitrovica CHPP. Sremska Mitrovica CHPP has a continuous cooling system, and is supplied by water from the Sava River. Return cooling water is discharged into the Sava River. The Sava River is classified as a Class II watercourse.

One drilled well is located on the land jointly owned by the ISTEP Company and Sremska Mitrovica CHPP. Water from this well acquires quality of drinking water upon deferrization process.

A part of wastewater is not discharged directly into the recipient but after processing in waste water treatment plant (oily waste water and heavy fuel oil contaminated waste water plant and sludgy water treatment plant) and from the neutralization pool in the plant for chemical water treatment is discharged through the pipeline network for waste, process and purified water, through control-gauging manhole into the city industrial-sewage collector. A use permit has been obtained for the pipeline network for waste, process and treated water with a connection point to the city sewage network.

After processing in sewage water treatment plant sanitary water is discharged through sewage pipeline network into the city industrial-sewage collector.

Sremska Mitrovica CHPP wastewater quality is controlled 4 times a year. Wastewater from Sremska Mitrovica CHPP is discharged via three outlets as:

- Cooling water into recipient the Sava River,
- Part of wastewater from the accelerator is joined with the wastewater from ISTEP Company and subsequently as one discharged into the recipient;
- Sanitary waste water is discharged through a separate pipeline into the city industrial-sewage collector;
- Wastewater (from HPV plant, from boilers desludging, water from oil-containing water separators, treated sludgy water) is discharged through control-gauging manhole into the city industrial-sewage collector

Monitoring programme includes the following physical-chemical parameters: temperature, pH, ammonia, nitrates, nitrites, total inorganic nitrogen, cyanides, suspended solids, dissolved oxygen, COD, BOD₅, total phosphorus, mineral oils, Pb, Cu, Ni, Zn, Cr, Fe, Cd.

Wastewater sampling is carried out four times a year at 9 measuring points:

1. Wastewater coming from control-gauging manhole at the discharging point into the city collector;
2. Wastewater coming from the last manhole before pouring into the Sava River;
3. Wastewater after boiler sludge removal;
4. Wastewater at the inlet and outlet of the plant for oily water treatment;
5. Wastewater at the inlet and outlet of the plant for sludgy water treatment;
6. Wastewater at the inlet and outlet of the plant for sewage water treatment.

Recipient, Sava River, sampling was carried out at 2 measuring points:

- At the water inlet into the water intake and
- After the wastewater discharge into the recipient.

Wastewater quality in 2021 was controlled on four occasions.

Table 92 shows analysis of wastewater, watercourse - recipient water quality data for 2021 in terms of their legal compliance for Panonske CHPPs Branch.

In the case of surface waters, legal compliance is evaluated by comparing the measured values of hazardous and harmful substances with the limits defined by the Regulation stipulating limit values for pollutants in surface and ground waters and sediments, and deadlines for their achievement (OG RS № 50/2012) while wastewater values are compared with the limits defined by the Regulation stipulating limit values of pollutants in water and deadlines for their achievement (OG RS № 67/2011, 48/2012 and 1/2016).

Table 94

PANONSKE CHPPs BRANCH			
Wastewater and water recipient quality in 2021			
Water type	Organizational unit		
	Novi Sad CHPP	Novi Sad CHPP	Novi Sad CHPP
Wastewater	No exceedance in 2021	I – IV quarter Inconsistency Suspended solids - BPK ₅ , HPK, total inorganic nitrogen, total phosphorus, total iron; Oil water - BPK ₅ . Neutralization pit - BPK ₅ , HPK, iron.	In I, III and IV quarter there were no exceedance of HVC in the samples of waste waters. In the second quarter , the parameters for BPK ₅ and HPK in the sample control water meter shaft at the connection to the city sewer collector have exceeded the HVC.
Recipient	No exceedance in 2021	I quarter Non-compliant for water class IIb Before inflow: dissolved oxygen, BOD ₅ , HPK, nitrites, ammonium ion, total phosphorus, copper. After infusion: dissolved oxygen, BOD ₅ , HPK, nitrites, ammonium ion, total phosphorus. II quarter Before inflow: BOD ₅ , cadmium; After inflow: BOD ₅ .	In the first quarter , the parameters for BOD ₅ , HPK, nitrites and nitrates in the Sava River do not correspond to class II watercourses. In the second quarter , the parameter for BOD ₅ in the Sava River does not correspond to the second class of watercourses. In the third quarter , the parameters for copper and iron in the Sava River do not correspond to the second class of watercourses. In the IV quarter , the parameters correspond to the II class of watercourses
		III quarter Before infusion: dissolved oxygen, BOD ₅ , ammonium ion, iron, nitrites, lead; After infusion: suspended solids, dissolved oxygen, BOD ₅ , HPK, ammonium ion, iron, lead, total phosphorus. IV quarter Before infusion: dissolved oxygen, BOD ₅ , ammonium ion, iron, nitrites, lead; After infusion: BOD ₅ , HPC, ammonium ion, iron, nitrites, total phosphorus.	In the first quarter , the parameters for BOD ₅ , HPK, nitrites and nitrates in the Sava River do not correspond to class II watercourses. In the second quarter , the parameter for BOD ₅ in the Sava River does not correspond to the second class of watercourses. In the third quarter , the parameters for copper and iron in the Sava River do not correspond to the second class of watercourses. In the IV quarter , the parameters correspond to the II class of watercourses

▪ **Water amounts**

Table 95 summarizes the amount of water captured and discharged by organizational units of Panonske CHPPs Branch in 2021. Annual amounts are calculated on the basis of the capacity, water capture and discharge pumps' operating time and flow gauges data.

Table 95

PANONSKE CHPPs BRANCH								
Captured and discharged water amounts in 2021 (m ³ /year x103)								
Organizational unit	Captured wastewater				Discharged wastewater			
	Used amounts		Permitted amounts		Return cooling water	Oily water	Sanitary wastewater	Other waste (neutralisation pit and luvo washing)
	Surface	Ground	Surface	Ground				
Novi Sad CHPP	79.619,997	-	80.853,971	-	78.904,584	1,496	8,123	12,500
Zrenjanin CHPP	102,68	-	-	-	-	1,100	1,320	3,869
Sremska Mitrovica CHPP	14,466	18,470	-	*72,533	-	-	8,583	6,119
TOTAL: Panonske CHPPs Branch	79.737,143	18,470		*72,533	78.904,584	2,596	18,026	22,488

* Data taken from the Book of Records on the status of groundwater reserves at the source of Sremska Mitrovica CHPP

▪ Improvements aimed at reducing surface and groundwater wastewater impacts

In order to control possible contamination of groundwater, which could occur through the activities of production facilities, during 2021, the Panonske CHPPs Branch performed periodic inspections of groundwater quality and determination of groundwater levels, as well as keeping records.

Records of measuring groundwater levels have been made since January 2021, and in December the second periodic examination of physical and chemical analyzes was performed.

Novi Sad CHPP

In order to reduce the impact of wastewater, it is planned to develop: Preliminary design, Feasibility study with Preliminary design, Environmental impact assessment study of Novi Sad CHPP wastewater treatment plant. In 2021, two periodic tests of groundwater were performed and it was determined that the activities of the plant have no impact on groundwater.

Zrenjanin CHPP

In 2021, two periodic tests of groundwater were performed and it was determined that the activities of the plant have no impact on groundwater.

Sremska Mitrovica CHPP

During 2021, the activities on obtaining the Water Permit were completed. In 2021, two periodic tests of groundwater were performed and it was determined that the activities of the plant have no impact on groundwater.

5.2.4. Measuring the Concentration of Pollutants, Harmful and Hazardous Substances in the Soil

Novi Sad CHPP, Zrenjanin CHPP and Sremska Mitrovica CHPP

So far, the soil has been tested as part of the study: „Monitoring of soil contamination around the tanks and unloading stations for liquid fuel and oil and lubricants storage within subsidiaries of the Public Enterprise Electric Power Industry of Serbia“ and „Monitoring of the system of oil baths and pits in the PE EPS facilities“.

Novi Sad CHPP

For the purposes of the study: "Monitoring of the system of oil baths and pits in the PE EPS facilities aimed at preventing environmental pollution - I phase", the testing of soil and groundwater was executed. In total 8 (eight) drillings were carried out and 8 (eight) composite soil samples were taken. According to the results of physical and chemical tests it can be concluded that the ground in the direct vicinity of oil baths and pits at the Novi Sad CHPP site is neither contaminated with arsenic and metals, such as chromium, nickel, lead, copper, zinc, cadmium, mercury and cobalt, nor with organic pollutants – mineral oils C₁₀-C₄₀, polychlorinated biphenyls (PCB), polycyclic aromatic hydrocarbons (PAH) and aromatic hydrocarbons (benzene, xylene, toluene and ethylbenzene).

For the purposes of the study: "Monitoring of soil contamination around the tanks and unloading stations for liquid fuel and oil and lubricants storage within subsidiaries of the Public Enterprise Electric Power Industry of Serbia", the testing of soil and groundwater was executed. In total 7 (seven) drillings were carried out and 7 (seven) composite soil samples were taken. According to the results of physical and chemical tests it can be concluded that the ground in the direct vicinity of heavy oil tank at the Novi Sad CHPP site is neither contaminated with arsenic and metals, such as chromium, nickel, lead, copper, zinc, cadmium, mercury and cobalt, nor with organic pollutants – mineral oils C₁₀-C₄₀, polychlorinated biphenyls (PCB), polycyclic aromatic hydrocarbons (PAH) and aromatic hydrocarbons (benzene, xylene, toluene and ethylbenzene).

Zrenjanin CHPP

For the purposes of the study: "Monitoring of the system of oil baths and pits in the PE EPS facilities aimed at preventing environmental pollution - I phase", the testing of soil and groundwater was executed. In total 3 (three) drillings were carried out and 3 (three) composite soil samples were taken and sampling of groundwater from drillings was performed. According to the results of physical and chemical tests it can be concluded that the ground in the direct vicinity of oil baths and pits at the Zrenjanin CHPP site is neither contaminated with arsenic and metals, such as chromium, nickel, lead, copper, zinc, cadmium, mercury and cobalt, nor with organic pollutants – mineral oils C₁₀-C₄₀, polychlorinated biphenyls (PCB), polycyclic aromatic hydrocarbons (PAH) and aromatic hydrocarbons (benzene, xylene, toluene and ethylbenzene).

For the purposes of the study: "Monitoring of soil contamination around the tanks and unloading stations for liquid fuel and oil and lubricants storage within subsidiaries of the Public Enterprise Electric Power Industry of Serbia", the testing of soil and groundwater was executed. In total 11 (eleven) drillings were carried out and 11 (eleven) composite soil samples were taken and the testing of groundwater from the drillings was also executed. According to the results of physical and chemical tests it can be concluded that the ground in the direct vicinity of oil baths and pits at the Zrenjanin CHPP site is neither contaminated with arsenic and metals, such as chromium, nickel, lead, copper, zinc, cadmium, mercury and cobalt, nor with organic pollutants – mineral oils C₁₀-C₄₀, polychlorinated biphenyls (PCB), polycyclic aromatic hydrocarbons (PAH) and aromatic hydrocarbons (benzene, xylene, toluene and ethylbenzene).

Sremska Mitrovica CHPP

For the purposes of the study: "Monitoring of the system of oil baths and pits in the PE EPS facilities aimed at preventing environmental pollution - I phase", the testing of soil and groundwater was executed. In total 2 (two) drillings were carried out and 2 (two) composite soil samples were taken. According to the results of physical and chemical tests it can be concluded that the ground in the direct vicinity of oil baths and pits at the Sremska Mitrovica CHPP site is neither contaminated with arsenic and metals, such as chromium, nickel, lead, copper, zinc, cadmium, mercury and cobalt, nor with organic pollutants – mineral oils C₁₀-C₄₀, polychlorinated biphenyls (PCB), polycyclic aromatic hydrocarbons (PAH) and aromatic hydrocarbons (benzene, xylene, toluene and ethylbenzene).

For the purposes of the study: "Monitoring of soil contamination around the tanks and unloading stations for liquid fuel and oil and lubricants storage within subsidiaries of the Public Enterprise Electric Power Industry of Serbia", the testing of soil and groundwater was executed. In total 10 (ten) drillings were carried out and 10 (ten) composite soil samples were taken. According to the results of physical and chemical tests it can be concluded that the ground in 7 (seven) drillings in the direct

vicinity of crude oil tanks at the Sremska Mitrovica CHPP site is neither contaminated with arsenic and metals, such as chromium, nickel, lead, copper, zinc, cadmium, mercury and cobalt, nor with organic pollutants – mineral oils C₁₀-C₄₀, polychlorinated biphenyls (PCB), polycyclic aromatic hydrocarbons (PAH) and aromatic hydrocarbons (benzene, xylene, toluene and ethylbenzene). Soil from 3 (three) drillings is contaminated with mineral oil, C₁₀-C₄₀. Repeated control test showed no contamination.

5.2.5. Environmental Noise Measurements

Environmental noise measurements at the Panonske CHPPs Branch (Novi Sad CHPP and Zrenjanin CHPP) were carried out by an accredited laboratory of the Novi Sad Occupational Safety Institute from 2008 to 2009 when the Rulebook on allowed environmental noise levels ("Official Gazette of RS" no. 54/92) was in force.

Novi Sad CHPP

Novi Sad CHPP environmental noise levels were not measured in 2021. The last measurement was carried out on 30th December 2008.

Zrenjanin CHPP

Zrenjanin CHPP environmental noise levels were not measured in 2021, the last measurement was carried out on 11th March 2009.

Sremska Mitrovica

Noise measurement is planned in Sremska Mitrovica CHPP once a year in the full working season. Mitrovica on cadastral parcel number 5933/7 C.M. Sremska Mitrovica and the Environmental Impact Assessment Study for the treatment of waste sludge waters generated in the process of preparation of industrial and decarbonized water on the cadastral parcel number 5933/8 C.M. Sremska Mitrovica. Measurement of noise in the environment in 2021 was performed by the authorized organization Rudarski Institut d.o.o Belgrade, Laboratory for Environmental and Working Protection, on November 30th and December 1st, 2021. year in the duration from 11 to 01 hours, according to the Law on Protection from Noise in the Environment ("Official Gazette of RS", No. 96/21), Rulebook on methods of noise measurement, content and scope of reports on noise measurement (Official Gazette of RS No. 72/10), Rulebook on conditions that must be met by a professional organization for noise measurement, as well as the documentation submitted with the request for obtaining authorization for noise measurement (" Official Gazette of RS ", No. 72 / 10) and the Decree on noise indicators, limit values, methods for assessment of noise indicators, harassment and harmful effects of noise in the environment ("Official Gazette of RS", No. 75/2010). Table 96 shows the noise level in 2021.

Table 96

PANONSKE CHPPS BRANCH			
Noise level in 2021 (dB)			
Noise indicator limit values Decree on noise indicators, limit values, methods for assessment of noise indicators, harassment and harmful effects of noise in the environment, "Official Gazette of RS" no. 75/10	Purpose of space	For day and night	For night
			35
	Rest and recreation areas, hospital zones and convalescent homes, cultural and historical sites, large parks.	50	40
	Tourist areas, camps and school zones.	50	45
	Purely residential areas.	55	45
	Business-residential areas, commercial-residential areas and children's playgrounds.	60	50
	City center, craft, trade, administrative zone with apartments, zone along highways, highways and city roads	65	55
	Industrial, storage and service areas and transport terminals without residential buildings.	At the border of this zone, the noise must not exceed the limit value in the zone with which it borders.	
Organizational unit	Sremska Mitrovica CHPP		

PANONSKE CHPPS BRANCH				
Noise level in 2021 (dB)				
Measuring point	MM-1	MM-2	MM-3	MM-4
For day	43,6 – 40,2	43,6 – 42,3	46,3 – 44,7	53,4 – 51,9
For night	44,4	43,0	44,8	49,7
For night	43,6 – 44,4	44,1 – 46,4	43,4 – 40,1	53,9 – 46,3

5.2.6. Waste

Waste produced in 2021 is shown in Table 94 in line with the Serbian waste management regulations.

Table 97

PANONSKA CHPPS BRANCH								
Waste generated in 2021								
№	Official nomenclature of the Rules defining waste categories, its testing and classification (OG RS № 56/2010 and 93/2019 and 39/2021)		Unit	Organizational unit				Note
				Novi Sad CHPP	Zrenjanin CHPP	Sremska Mitrovica CHPP	Total Panonske CHPPs Branch	
	Name	Index number		Amounts				
1.	Used printer cartridges other than indicated under 08 03 17	08 03 18	t	0,000	0,000	0,024	0,024	Waste printer cartridges
2.	Ash, slag and dust from the boiler (other than the one from the boiler indicated under 10 01 04)	10 01 01	t	3,000	0,000	0,000	3,000	Waste ash
3.	Slag and dust from the boiler from co-incineration other than the one indicated under 10 01 14	10 01 15	t	0,000	0,000	171,890	171,890	Waste ash from biomass fired boiler
4.	Mixed material packing	15 01 06	t	0,000	0,000	0,000	0,000	Jumbo bags
5.	Packaging that contains residues of hazardous substances or is contaminated with hazardous substances	15 01 10*	t	0,020	0,000	0,000	0,0200	Plastic wrapping
6.	Absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing, contaminated by hazardous substances	15 02 02*	t	0,050	0,150	0,000	0,200	Waste oily adsorption agent - sawdust and wiping cloths
7.	Absorbents, filter materials, wiping cloths and protective clothing other than those indicated under 15 02 02	15 02 03	t	0,000	0,000	0,000	0,000	Filter bags from biomass boiler bag filter.
8.	Lead batteries	16 06 01*	t	0,00	0,000	0,062	0,062	Lead batteries
9.	Alkaline batteries (other than 16 06 03)	16 06 04	t	0,000	0,000	0,003	0,003	Alkaline batteries
10.	Bricks	17 01 02	t	0,000	0,000	0,000	0,000	Chamotter from boiler
11.	Aluminum	17 04 02	t	3,974	0,020	0,000	3,974	Aluminum sheet and window frames
12.	Zinc	17 04 04	t	0,00	0,000	0,140	0,140	Galvanized sheet
13.	Iron and steel	17 04 05	t	11,400	0,000	0,000	11,400	Different fittings, pipes, sheets, valves
14.	Mixed metals	17 04 07	t	0,970	0,000	0,000	0,970	Mixed metals
15.	Cables other than those indicated under 17 04 10	17 04 11	t	0,000	0,000	0,003	0,003	Copper insulated cables
16.	Insulation materials other than those indicated under 17 06 01 and 17 06 03	17 06 04	t	2,500	0,700	0,114	3,314	Waste mineral wool



PANONSKE CHPPS BRANCH								
Waste generated in 2021								
№	Official nomenclature of the Rules defining waste categories, its testing and classification (OG RS № 56/2010 and 93/2019 and 39/2021)		Unit	Organizational unit				Note
				Novi Sad CHPP	Zrenjanin CHPP	Sremska Mitrovica CHPP	Total Panonske CHPPs Branch	
	Name	Index number		Amounts				
17.	Saturated or exhausted ion exchange resins	19 09 05	t	0,000	0,000	0,000	0,000	Waste ion exchange resins
18.	Paper and cardboard	20 01 01	t	0,000	0,000	0,000	0,000	-
19.	Fluorescent tubes and mercury-containing waste	20 01 21*	t	0,045	0,000	0,014	0,059	Waste fluorescent tubes
20.	Discarded electronic and electrical equipment which contains hazardous components	20 01 35*	t	0,000	0,000	0,014	0,014	-
21.	Discarded electrical and electronic equipment other than the one indicated under 20 01 21 and 20 01 23 and 20 01 35	20 01 36	t	0,000	0,000	0,360	0,360	-
22.	Plastics	20 01 39	t	0,000	0,000	0,000	0,000	-

Note: The stated quantities of waste are determined by free estimate. The actual quantity is determined during the delivery of waste to authorized operators by measuring on a scale verified by authorized organizations.

Sold / delivered waste in 2021 is shown in Table 98.

Table 98

PANONSKJE CHPPS BRANCH								
Sold / delivered quantities of waste in 2021								
No	Ordinance on categories, testing and classification of waste ("Official Gazette of RS" No. 56/2010, 93/2019 and 39/2021)		Unit	Organizational unit				Note
				CHPP Novi Sad	CHPP Zrenjanin	CHPP Sremska Mitrovica	Total Panonske CHPPs Branch	
				Quantities of waste generated				
	Name	Index No						
1.	Slag and co-incineration boiler dust other than those mentioned in 10 01 14	10 01 15	t	0,000	0,000	171,890	171,890	Waste ash from a biomass boiler

5.3. Working Environment Monitoring, Occupational Health and Safety

The reports on occupational safety and health for 2021 include the following elements:

- **Monitoring the working environment**
 - measurement of noise in the working environment
- **Safety at work**
 - employee training
 - work injuries

5.3.1. Working Environment Monitoring

- **Working Environment Noise Measurements**

Novi Sad CHPP

Working environment noise measurements in 2021 is shown in Table 99.

Zrenjanin CHPP

Working environment noise measurements were not conducted in 2021.

Sremska Mitrovica CHPP

Working environment noise measurements in 2021 is shown in Table 99.

Table 99

PANONSKJE CHPPS BRANCH			
Working environment noise in 2021			
Organizational unit	Operating plant	Registered noise level (dB(A))	Permissible noise level (dB(A))
Novi Sad CHPP	Pumping station - lower gallery	93	85
	HPV drive - mid drive	82	85
	Locksmith workshop - turners	81	85
	Generator G1	91	85
	Boiler 3 - drum	93	85
Zrenjanin CHPP	-	-	85
	-	-	85
	-	-	85
	-	-	85
	-	-	85
Sremska Mitrovica CHPP	Pumping Station Operator 's Office 1	58	70
	Office of the Head od the HTP Service	44	45
	Station filter	76	83
	Auxiliary boiler room - boiler operator	66	70
	Auxiliary boiler room	86	85

5.3.2. Occupational Safety

Employee training

Training for safe and healthy work - internal, general training in the field of OSH are given in Table 100.

Table 100

PANONSKE CHPPS BRANCH		
Employee training in 2021		
Organization unit	Number of trained people	Note-internal training
Directorate	10	When changing jobs
Novi Sad CHPP	150	High-risk jobs, job changes, and non-high-risk jobs and agencies
Novi Sad CHPP	200	Introducing contractors and services to hazards and hazards, OSH measures and rules of conduct
Novi Sad CHPP	40	Introducing students to practical classes, professional practice with dangers and harms, OSH measures and rules of conduct
Zrenjanin CHPP	81	Jobs with increased risk of job changes, job vacancies, retirements, internal general OSH training.
Zrenjanin CHPP	69	Introducing contractors to hazards and hazards, OSH measures and rules of conduct
Zrenjanin CHPP	12	Introducing students to practical classes, professional practice with dangers and harms, OSH measures and rules of conduct, Introducing visitors and service providers to OSH measures and rules of conduct
Sremska Mitrovica CHPP	55	Jobs with increased risk, change of jobs, relocation due to vacancies, retirements, internal general training in OSH.
Sremska Mitrovica CHPP	30	Introducing contractors to hazards and hazards, OSH measures and rules of conduct
Sremska Mitrovica CHPP	30	Introducing visitors and service providers to OSH measures and rules of conduct

Other trainings in 2021 - external trainings are given in Table 101.

Table 101

PANONSKE CHPPS BRANCH			
Other trainings in 2021			
No	Type of training	No of people	Note
1	Final periodic training at mandatory seminars for improving knowledge (TPP "Novi Sad")	1	Professional Driver Training Center - Bugarinović Transport d.o.o.
2	Training - Project for establishing a system for monitoring and reporting on CO2 emissions in PE EPS (TPP "Sremska Mitrovica")	6	Dragan Vukotić PE EPS and Matej Gasperič EIMV (consultant)
3	Improving knowledge for professional drivers for CPC card extension (TPP"Sremska Mitrovica")	1	Professional Driver Training Center - Bugarinović Transport d.o.o.

Work injuries

Table 102 provides data on the number of injuries at work in 2021.

Table 102

PANONSKE CHPPS BRANCH						
Injuries at work in 2021						
Organizational unit	Number of employees	Injuries in relation to the number of employees				
		Light	Heavy	Mortal	Total	%
Directorate	36	0	0	0	0	0,00
Novi Sad CHPP	161	6	0	0	6	3,73
Zrenjanin CHPP	102	0	0	0	0	0,00
Sremska Mitrovica CHPP	71	2	0	0	2	2,82
TOTAL: Panonske CHPPS Branch	370	8	0	0	8	2,16

5.3.3. Health Protection

Table 103 provides data on periodic inspections of employees working in high-risk workplaces in 2021 in the "Panonske" CHPPS Branch.

Table 103

PANONSKE CHPPS BRANCH											
Working capacity of employees in 2021											
Organizational unit	Number of employees	Periodic inspection				For work					
		Sent for review		Reviewed		Capable		Limitedly capable		Incapable	
		No	%	No	%	No	%	No	%	No	%
Directorate	36	0	0,00	0	0,00	0	0,00	0	0,00	0	0,00
Novi Sad CHPP	161	134	83,23	134	100,00	42	31,34	92	68,66	0	0,00
Zrenjanin CHPP	102	83	81,37	83	100,00	55	66,27	28	33,73	0	0,00
Sremska Mitrovica CHPP	71	55	77,46	53	96,36	37	69,81	16	30,19	0	0,00
TOTAL: Panonske CHPPS Branch	370	272	73,51	270	99,26	134	49,63	136	50,37	0	0,00

5.4. Public Submissions

Public submissions for 2021 are shown in Table 104.

Table 104

PANONSKE CHPPS BRANCH			
Public submissions for 2021			
Organizational unit	Submission (no. Date and from whom it was submitted)	Subject of the submission	Action taken
Novi Sad CHPP	Provincial Secretariat for Urbanism and Environmental Protection number 140-501-754 / 2021 from 05.07.2021. based on the submission of the Regulatory Institute for Renewable Energy and Environment from Belgrade	Request for the performance of extraordinary inspection supervision in accordance with the provisions of the Law on Environmental Protection and the Law on Integrated Prevention and Control of Environmental Pollution.	Extraordinary inspection of the provincial inspector for environmental protection was performed. Inspection report number 140-501-754-1 / 2021-06 from 30.07.2021. no illegalities were found in the conduct of the supervised entity.
Zrenjanin CHPP	There were no public submissions		
Sremska Mitrovica CHPP	There were no public submissions		

6. HPP DJERDAP BRANCH

6.1. Overview and Status of Permits

An overview and status of permits, licenses and other required approvals, as well as new requirements for obtaining or renewing valid licenses and approvals during 2021, is shown in Table 105.

Table 105

HPP DJERDAP BRANCH			
Review and status of permits in 2021			
Object	Permits and approvals obtained (Number and date)	New requirements for obtaining or renewing valid permits	Note
HPP DJERDAP 2	<p>During 2021, the Branch of HPP "Đerdap" 2 Negotin received the following decision:</p> <p>- Decision no. 09/8/2 no. 217-15-54 / 2021 from 12.05.2021. MUP, SVS, the consent of PE EPS, Branch of HPP "Đerdap", HPP "Đerdap" 2 is given to the Project documentation for the construction of a public alarm system and acoustic study. Certified project documentation for the construction of a public alarm system and acoustic study are an integral part of this solution.</p>	<p>We are waiting to receive specific tasks in protection and rescue, to supplement the part related to: readiness, readiness, activation and execution of tasks in accordance with the instructions on the Methodology of development and content of disaster risk assessment and protection and rescue plan. (within 60 days of receiving the specific task)</p>	-
VLASINSKE HPP	<p>Decision on issuing the Water Permit for HPP "Vrla" 1, HPP "Vrla" 2, HPP "Vrla" 3 and HPP "Vrla" 4, Bpoj: 325-04-00011 / 2021-07 dated 18.01.2021</p> <p>Decision on issuing the Water Permit for PAP "Lisina" No. 325-04-000012 / 2021-07 dated 18 January 2021</p>	-	-

6.2. Monitoring and Environmental Impact

Environmental protection in the Branch of HPP "Đerdap" during 2021 was carried out according to defined procedures and other documents of the environmental management system (EMS).

6.2.1. Identified negative impacts on the Flow and Ecological System under the Accumulation

During 2021, no negative impacts on the flow and ecological system under the accumulation were registered in the facilities of the Đerdap Branch, except for the HPP Đerdap 2, where four impacts were registered, no impact on the flow and no significant and proven impact. to the ecological system below the reservoir. These are events that were recorded during March, September, October and November 2021. Cleaning of oil from the water surface of the middle pumping basin of the Basic Power Plant was performed in the period from March 11st, 2021. until March 17th, 2021 (report number 01.02.171916/1-2021). On September 9th, the ecological treatment of the oily surface of the Danube watercourse in the zone of the Additional Power Plant and the Chamber of the Brodska prevodnica - downstream side was carried out (report number: 01.02-437330/1-2021). On October 13th, 2021 there was an oil leak in the drainage gutter at the level of 12.25 m above sea level of the additional power plant in the zone of aggregates A9 and A10 (Report number: 01.02-515016/1-2021). On November 11th, 2021, there was a fat stain upstream from the Main Power Plant and the

Overflow Dam, which was reported to the Republic Inspectors of Water Management and Environmental Protection (report number: 01.02-590704/1-2021).

6.2.2. Water

• Water quantity

The use of water for the production of hydroelectric energy, technical water and sanitary (waste) water was performed in permitted quantities. The quantities of allowed and used water for the production of electricity as well as the quantities of discharged water after the produced electricity for 2021 are given in Table 106

Table 106

HPP DJERDAP BRANCH							
Water quantities in 2021							
Object	Number of aggregates	Permitted amount of water (installed flow per unit) m ³ /s	Amounts of water discharged				
			Water used for the production of electricity. energy in 2020m ³ / year.x10 ⁶	Technical waterm ³ / year.x10 ⁶	Sanitary waterm ³ / year.x10 ³	Total water dischargedm ³ / year.x10 ⁶	
HPP DJERDAP 1	6	800	80.038,000	310,287	231,840	80.287,333	
HPP DJERDAP 2	10	422	75,858	90,200	68,825	76.017,3	
HPP PIROT	2	22,5	272.195	0,009	2,502	272.195,009	
„VLASINSKE HPP“	Vrla 1	4	I и II – 8,1 III и IV - 10	197,869	1,987	7,300	197,869
	Vrla 2	2	I – 8,5 II - 10	243,632	1,264	3,700	243,632
	Vrla 3	2	I – 8,4 II - 10	263,473	1,694	10,300	263,473
	Vrla 4	2	I – 8,4 II - 10	289,445	1,251	3,700	289,445
	Lisina – pumping plant	2	I – 3,6 II – 3,6	99,606	0,712	3,500	99,606

• Water quality

Based on contractual obligations related to wastewater control, the Institute of Occupational Safety a.d. Novi Sad performed direct sampling of surface waters from all electric power facilities within the PE EPS, Branch of HPP "Djerdap", in 2021.

Two samples were taken from the power facilities of the Đerdap HPP Branch, as follows:

- surface water sample upstream of the building;
- surface water sample downstream of the facility;

which were chemically and bacteriologically analyzed, and the interpretation of the results was performed in accordance with the Decree on limit values of pollutants in surface and groundwater and sediment and deadlines for their achievement ("Official Gazette of RS", No. 50/2012), Rulebook on parameters of ecological and chemical status of surface waters and parameters of chemical and quantitative status of groundwater ("Official Gazette of RS", No. 74/2011), Decree on limit values of emissions of pollutants into water and deadlines for their achievement (Official Gazette of RS ", No. 67/2011 and 48/2012), the Decree on the Classification of Waters (" Official Gazette of the SFRY ", No. 6/1978), the Decree on the Classification of Waters of Inter-Republican Watercourses, Interstate Waters and Coastal Waters of Yugoslavia (Official Gazette SFRY, No. 6/78), Decisions on maximum permissible concentrations of radionuclides and hazardous substances in inter-republican watercourses, interstate waters and coastal waters of Yugoslavia (Official Gazette of the SFRY, No. 8/78) and the Law on Waters RS Gazette ", No. 30/2010, 93/2 012, 101/2016, 95/2018 and 95/2018 - others. law) The results obtained by chemical and bacteriological analysis of surface water samples in 2021 are given in Table 107.

Table 107

HPP Djerdap Brach															
Surface waters in 2021															
Object	Test parameters (Unit of measure)	Results of surface water quality testing in 2021													Commentary on test results and conclusion (Comment on the chemical and bacteriological analysis of samples from the sewage system and surface water upstream and downstream of the facility and their impact on the water class according to the Regulation on Water Classification)
		1. quarter			2. quarter			3. quarter			4. quarter			Limit values for surface waters (II class)	
		From the sewer system- before	Surface water upstream of the building	Surface water downstream of the building	From the sewer system- before	Surface water upstream of the building	Surface water downstream of the building	From the sewer system- before inflow	Surface water upstream of the building	Surface water downstream of the building	From the sewer system- before inflow	Surface water upstream of the building	Surface water downstream of the building		
HPP Djerdap 1	MPN coliform. bacteria. (E. coli/1l)	-	-	-	-	-	-	-	1,4x10 ⁴	2,5x10 ⁴	-	2,5x10 ²	6x10 ²	5 x10 ² -1 x10 ⁴	In the third and fourth quarters, based on the obtained results for surface waters upstream and downstream, it can be stated that the examined parameters meet the II and III class of ecological potential according to: Ordinance on parameters of ecological and chemical status of surface waters and parameters RS Gazette ", No. 74/2011. Note: the survey was not conducted in the first and second quarters.
	Dissolved O ₂ (mg/l)	-	-	-	-	-	-	-	7,77	7,77	-	9,05	9,33	7	
	Suspended matter (mg/l)	-	-	-	-	-	-	-	8,40	7,20	-	<1	8,40	25	
	HPK (mg/l)	-	-	-	-	-	-	-	12,00	6,8	-	10	11,3	15	
	BPK5 (mg/l)	-	-	-	-	-	-	-	1,20	1,01	-	0,8	0,8	5	
	pH value	-	-	-	-	-	-	-	8,03	7,94	-	7,78	7,88	6.5-8.5	
	Total oils and fats (mg/l)	-	-	-	-	-	-	-	<0,01	<0,01	-	<0,01	<0,01	-	
HPP Djerdap 2	MPN coliform. bacteria. (E. coli/1l)	-	-	-	-	-	-	-	3,2x10 ³ cfu/100 ml -	1,4x10 ⁴ cfu/100 ml -	-	1.9x10 ³ cfu/100 ml -	2.3x10 ³ cfu/100 ml -	5 x10 ² -1 x10 ⁴	For samples V0407 / 1 and V0407 / 2 tested microbiological parameters meet the III-IV CLASS of ecological potential according to: Ordinance on parameters of ecological and chemical status of surface waters and parameters of chemical and quantitative status of groundwater, "Official Gazette of RS", No. 74/2011 . Annex 3. Surface water samples belong to significantly changed water bodies -
	Dissolved O ₂ (mg/l)	-	-	-	-	-	-	-	7,84	7,74	-	9,26	9,33	7,00	
	Suspended matter (mg/l)	-	-	-	-	-	-	-	9,20	11,60	-	<1	6,40	25	
	HPK (mg/l)	-	-	-	-	-	-	-	6,20	6,50	-	5,50	5,80	15	
	BPK5 (mg/l)	-	-	-	-	-	-	-	1,08	1,11	-	0,92	1,04	5,0	

HPP Djerdap Brach															
Surface waters in 2021															
Object	Test parameters (Unit of measure)	Results of surface water quality testing in 2021													Commentary on test results and conclusion (Comment on the chemical and bacteriological analysis of samples from the sewage system and surface water upstream and downstream of the facility and their impact on the water class according to the Regulation on Water Classification)
		1. quarter			2. quarter			3. quarter			4. quarter			Limit values for surface waters (II class)	
		From the sewer system- before	Surface water upstream of the building	Surface water downstream of the building	From the sewer system- before	Surface water upstream of the building	Surface water downstream of the building	From the sewer system- before inflow	Surface water upstream of the building	Surface water downstream of the building	From the sewer system- before inflow	Surface water upstream of the building	Surface water downstream of the building		
pH value		-	-	-	-	-	-	-	7,87	7,77	-	7,98	7,96	6,5-8,5	accumulations formed on TYPE 1 water bodies. For samples V0763 / 1 and V0763 / 2, the tested microbiological parameters meet the II-III CLASS of ecological potential according to: Rulebook on parameters of ecological and chemical status of surface waters and parameters of chemical and quantitative status of groundwater, "Official Gazette of RS", No. 74/2011. Annex 3. Surface water samples belong to significantly changed water bodies - accumulations formed on TYPE 1 water bodies. Note: the survey was not conducted in the first and second quarters.
	Total oils and fats (mg/l)	-	-	-	-	-	-	-	<0,01	<0,01	-	<0, 01	<0,01	5	
HPP „PIROT“	MPN coliform. bacteria. (E. coli/1l)	-	-	-	-	-	-	-	3,3 x10 ³	1 x10 ⁴	-	5,2 x10 ³	4,5,2 x10 ³⁻	5 x10 ² – 1 x10 ⁴	For the sample upstream of the inflow, tested physical-chemical parameters of the II class according to the values provided by the Decree on limit values of pollutants in surface and groundwater and sediment and deadlines for their achievement (Official Gazette of RS; No. 50/2012). status of surface waters and parameters of chemical and quantitative
	Dissolved O ₂ (mg/l)	-	-	-	-	-	-	-	7,13	8,02	-	9,64	10,24	7	
	Suspended matter (mg/l)	-	-	-	-	-	-	-	10,40	8,40	-	25	20	25	
	HPK (mg/l)	-	-	-	-	-	-	-	4,20	4,50	-	< 4	11,4	15	

HPP Djerdap Brach															
Surface waters in 2021															
Object	Test parameters (Unit of measure)	Results of surface water quality testing in 2021													Commentary on test results and conclusion (Comment on the chemical and bacteriological analysis of samples from the sewage system and surface water upstream and downstream of the facility and their impact on the water class according to the Regulation on Water Classification)
		1. quarter			2. quarter			3. quarter			4. quarter			Limit values for surface waters (II class)	
		From the sewer system- before	Surface water upstream of the building	Surface water downstream of the building	From the sewer system- before	Surface water upstream of the building	Surface water downstream of the building	From the sewer system- before inflow	Surface water upstream of the building	Surface water downstream of the building	From the sewer system- before inflow	Surface water upstream of the building	Surface water downstream of the building		
	BPK5 (mg/l)	-	-	-	-	-	-	-	1,00	1,05	-	0,98	2,70	5	<p>status of groundwater, "Official Gazette of RS", No. 74/2011 for chemical and physico-chemical quality elements, the sample has a good ecological status.</p> <p>For the sample downstream of the inflow, the physico - chemical parameters of class II were examined according to the values predicted.</p> <p>Decree on limit values of pollutants in surface and groundwater and sediment and deadlines for their achievement (Official Gazette of RS; No. 50/2012) According to the Rulebook on parameters of ecological and chemical status of surface waters and parameters of chemical and quantitative status of groundwater, "Official glasnik RS ", no. 74/2011 for chemical and physico-chemical quality elements, the sample has a good ecological status.</p> <p>Note: the survey was not conducted in the first and second quarters.</p>
	pH value	-	-	-	-	-	-	-	8,02	7,95	-	8,10	8,15	6.5-8.5	
	Total oils and fats (mg/l)	-	-	-	-	-	-	-	<0,01	<0,01	-	<0,01	<0,01	-	
VLASINSKE HPP Vlasina lake	MPN coliform. bacteria. (E. coli/1l)	-	-	-	-	-	-	-	1x10 ⁴	2x10 ²	-	86	71	5x10 ² -1x10 ⁴	Based on the measured values, the tested samples meet the values defined

HPP Djerdap Brach															
Surface waters in 2021															
Object	Test parameters (Unit of measure)	Results of surface water quality testing in 2021													Commentary on test results and conclusion (Comment on the chemical and bacteriological analysis of samples from the sewage system and surface water upstream and downstream of the facility and their impact on the water class according to the Regulation on Water Classification)
		1. quarter			2. quarter			3. quarter			4. quarter			Limit values for surface waters (II class)	
		From the sewer system- before	Surface water upstream of the building	Surface water downstream of the building	From the sewer system- before	Surface water upstream of the building	Surface water downstream of the building	From the sewer system- before inflow	Surface water upstream of the building	Surface water downstream of the building	From the sewer system- before inflow	Surface water upstream of the building	Surface water downstream of the building		
HPP „VRLA 1“	Dissolved O ₂ (mg/l)	-	-	-	-	-	-	-	8,56	8,15	-	7,88	8,88	8,5	by the Regulation on Water Classification ("Official Gazette of RS", No. 5/68) for Class I and meet the values defined by the Ordinance on Hazardous Substances in Waters "Official Gazette of SRS", No. 31/82) for class I and II. The values for dominantly correspond to the II class of ecological potential. Note: the survey was not conducted in the first and second quarters.
	Suspended matter (mg/l)	-	-	-	-	-	-	-	<1,0	<1,0	-	1,6	1,20	25	
	HPK (mg/l)	-	-	-	-	-	-	-	<4,0	<4,0	-	<4,0	<4,0	15	
	BPK5 (mg/l)	-	-	-	-	-	-	-	0,7	0,71	-	0,68	0,71	1,5	
	pH value	-	-	-	-	-	-	-	7,94	8,56	-	7,55	7,65	6,5-8,5	
	Total oils and fats (mg/l)	-	-	-	-	-	-	-	<0,01	<0,01	-	<0,01	<0,01	<0,05	
VLASINSKE HPP HPP „VRLA 2“	MPN coliform. bacteria. (E. coli/1l)	-	-	-	-	-	-	-	2x10 ²	1,7x10 ⁴	-	4,5 x10 ²	1,1 x10 ²	5x10 ² -1x10 ⁴	Based on the measured values, the tested samples meet the values defined by the Regulation on Water Classification ("Official Gazette of RS", No. 5/68) for Class I and meet the values defined by the Ordinance on Hazardous Substances in Waters ("Official Gazette of SRS"). No. 31/82) for class I and II. The values for dominantly correspond to the II class of ecological potential. Note: the survey was not conducted in the first and second quarters.
	Dissolved O ₂ (mg/l)	-	-	-	-	-	-	-	8,15	8,52	-	9,36	8,92	8,5	
	Suspended matter (mg/l)	-	-	-	-	-	-	-	<1,0	8,0	-	1,60	1,60	25	
	HPK (mg/l)	-	-	-	-	-	-	-	<4,0	<4,0	-	<4,0	<4,0	10	
	BPK5 (mg/l)	-	-	-	-	-	-	-	0,71	0,66	-	0,56	0,65	1,8	
	pH value	-	-	-	-	-	-	-	8,56	7,49	-	7,58	7,55	6,5-8,5	
	Total oils and fats (mg/l)	-	-	-	-	-	-	-	<0,01	<0,01	-	<0,01	<0,01	<0,3	

HPP Djerdap Brach															
Surface waters in 2021															
Object	Test parameters (Unit of measure)	Results of surface water quality testing in 2021													Commentary on test results and conclusion (Comment on the chemical and bacteriological analysis of samples from the sewage system and surface water upstream and downstream of the facility and their impact on the water class according to the Regulation on Water Classification)
		1. quarter			2. quarter			3. quarter			4. quarter			Limit values for surface waters (II class)	
		From the sewer system- before	Surface water upstream of the building	Surface water downstream of the building	From the sewer system- before	Surface water upstream of the building	Surface water downstream of the building	From the sewer system- before inflow	Surface water upstream of the building	Surface water downstream of the building	From the sewer system- before inflow	Surface water upstream of the building	Surface water downstream of the building		
VLASINSKE HPP HPP „VRLA 3“	MPN coliform. bacteria. (E. coli/1l)	-	-	-	-	-	-	-	1,7x10 ⁴	3,5x10 ³	-	1,1 x10 ²	72	5x10 ² -1x10 ⁴	Based on the measured values, the tested samples meet the values defined by the Regulation on Water Classification ("Official Gazette of RS", No. 5/68) for Class I and meet the values defined by the Ordinance on Hazardous Substances in Waters ("Official Gazette of SRS"). No. 31/82) for class I and II. The values for dominantly correspond to the II class of ecological potential. Note: the survey was not conducted in the first and second quarters.
	Dissolved O ₂ (mg/l)	-	-	-	-	-	-	-	8,52	8,59	-	9,92	9,59	8,5	
	Suspended matter (mg/l)	-	-	-	-	-	-	-	8,00	10,0	-	1,60	0,40	25	
	HPK (mg/l)	-	-	-	-	-	-	-	<4,0	<4,0	-	<4,00	<4,00	10	
	BPK5 (mg/l)	-	-	-	-	-	-	-	0,66	0,7	-	0,65	0,62	1,8	
	pH value	-	-	-	-	-	-	-	7,49	7,76	-	7,55	7,50	6,5-8,5	
	Total oils and fats (mg/l)	-	-	-	-	-	-	-	<0,01	<0,01	-	<0,01	<0,01	<0,05	
VLASINSKE HPP HPP „VRLA 4“	MPN coliform. bacteria. (E. coli/1l)	-	-	-	-	-	-	-	3,5x10 ³	7x10 ³	-	72	84	5x10 ² -1x10 ⁴	Based on the measured values, the tested samples meet the values defined by the Regulation on Water Classification ("Official Gazette of RS", No. 5/68) for Class I and meet the values defined by the Ordinance on Hazardous Substances in Waters ("Official Gazette of SRS"). No. 31/82) for class I and II. The values for dominantly correspond to the II class of ecological potential.
	Dissolved O ₂ (mg/l)	-	-	-	-	-	-	-	8,59	8,56	-	9,59	8,94	8,5	
	Suspended matter (mg/l)	-	-	-	-	-	-	-	10,0	1,0	-	0,40	1,60	25	
	HPK (mg/l)	-	-	-	-	-	-	-	<4,0	<4,0	-	<4,0	<4,0	10	
	BPK5 (mg/l)	-	-	-	-	-	-	-	0,7	0,7	-	0,62	0,66	1,8	

HPP Djerdap Brach															
Surface waters in 2021															
Object	Test parameters (Unit of measure)	Results of surface water quality testing in 2021													Commentary on test results and conclusion (Comment on the chemical and bacteriological analysis of samples from the sewage system and surface water upstream and downstream of the facility and their impact on the water class according to the Regulation on Water Classification)
		1. quarter			2. quarter			3. quarter			4. quarter			Limit values for surface waters (II class)	
		From the sewer system- before	Surface water upstream of the building	Surface water downstream of the building	From the sewer system- before	Surface water upstream of the building	Surface water downstream of the building	From the sewer system- before inflow	Surface water upstream of the building	Surface water downstream of the building	From the sewer system- before inflow	Surface water upstream of the building	Surface water downstream of the building		
pH value		-	-	-	-	-	-	-	7,76	7,94	-	7,50	7,45	6,5-8,5	Note: the survey was not conducted in the first and second quarters.
	Total oils and fats (mg/l)	-	-	-	-	-	-	-	<0,01	<0,01	-	<0,01	<0,01	<0,03	
VLASINSKE HPP LISINA LAKE LISINA	MPN coliform. bacteria. (E. coli/1l)	-	-	-	-	-	-	-	1,6x10 ⁴	1x10 ⁴	-	86	86	5x10 ² -1x10 ⁴	Based on the measured values, the tested samples meet the values defined by the Regulation on Water Classification ("Official Gazette of RS", No. 5/68) for Class I and meet the values defined by the Ordinance on Hazardous Substances in Waters ("Official Gazette of SRS"). No. 31/82) for class I and II. The values for dominantly correspond to the II class of ecological potential. Note: the survey was not conducted in the first and second quarters.
	Dissolved O ₂ (mg/l)	-	-	-	-	-	-	-	8,60	8,56	-	7,88	7,88	8,5	
	Suspended matter (mg/l)	-	-	-	-	-	-	-	1,00	<1,00	-	1,60	1,60	25	
	HPK (mg/l)	-	-	-	-	-	-	-	<4,00	<4,00	-	<4,0	<4,0	10	
	BPK5 (mg/l)	-	-	-	-	-	-	-	0,80	0,70	-	0,68	0,68	1,8	
	pH value	-	-	-	-	-	-	-	7,41	7,94	-	7,55	7,55	6,5-8,5	
	Total oils and fats (mg/l)	-	-	-	-	-	-	-	<0,01	<0,01	-	<0,01	<0,01	<0,05	

6.2.3. Waste

Waste management was performed according to defined procedures. The amounts of waste generated during 2021 are shown in Table 108.

Table 108

HPP DJERDAP BRANCH										
Waste types generated in 2021										
No	Ordinance on categories, testing and classification of waste ("Official Gazette of RS" No. 56/2010, 93/2019 and 39/2021)		Unit	Object					TOTAL	Note
				HPP Djerdap 1	HPP Djerdap 2	HPP Pirot	Vlasinske HPP	SOP Pozarevac		
	Name	Index		Amounts						
1.	Waste toner for printing other than that specified in 08 03 17	08 03 18	t	0,000	0,000	0,017	0,050	0,000	0,067	Toner cartridges
2.	Non-chlorinated mineral hydraulic oils	13 01 10*	t	23,620	0,000	0,000	0,000	0,000	23,620	Waste hydraulic oil
3.	Non-chlorinated mineral oils for insulation and heat transfer	13 03 07*	t	0,710	0,000	0,200	0,100	0,000	1,010	Waste transformer oil
4.	Other emulsions	13 08 02*	t	3,650	9,49	0,050	0,677	0,000	13,867	Oil emulsion (mixed with adsorbents and other impurities)
	Oiled water from oil / water separator	13 05 07*	t	-	-	-	-	-	0,000	
	Fuel and diesel	13 07 01*	t	-	-	1,840	-	-	1,840	Waste diesel fuel
5.	Mineral non-chlorinated hydraulic oils Wastes not otherwise specified	13 01 10*	t	15,000	1,460	0,200	0,000	0,000	16,660	Waste turbine oil
		13 08 99*		0,000	0,000	0,000	0,000	0,000	0,000	Compressor oil
6.	Absorbents, filter materials (including oil filters not otherwise specified), wipes, protective clothing, contaminated with hazardous substances	15 02 02*	t	0,316	0,400	0,417	0,647	0,000	1,780	Cloths, adsorbents and contaminated with hydrocarbons
7.	Waste tires	16 01 03	t	3,680	0,005	0,203	0,021	0,000	3,909	Worn tires
8.	Plastic wrapping	16 01 19	t	0,001	0,105	0,024	0,006	0,000	0,136	Waste plastic
	Copper, bronze, brass	15 01 02								
9.	Бакар, бронза, месинг	17 04 01	t	5,580	4,400	0,000	0,000	0,000	9,98	Copper
			t	0,000	0,000	0,000	0,000	0,000	0,000	Brass

			t	0,000	0,000	0,000	0,000	0,000	0,000	Bronze
10.	Cables other than those mentioned in 17 04 10	17 04 11	t	65,600	0,00	0,000	0,020	0,000	65,620	Copper cable
11.	Aluminum	17 04 02	t	1,758	0,000	0,001	0,000	0,000	1,759	Aluminum
	Colored metals	19 12 03								
12.	Iron and steel	17 04 05		170,330	0,000	0,000	0,003	0,000	170,333	Steel sheet
				0,000	0,000	0,000	0,000	0,000	0,000	Stainless steel
				987,902	39,02	0,8338	0,981	0,000	1.028,736	Scrap iron
				0,140	0,46	0,056	0,000	0,000	0,656	Metal shavings
13.	Paper and cardboard	20 01 01	t	0,000	0,000	0,300	0,001	0,000	0,301	Paper waste material
14.	Glass	20 01 02	t	4,100	0,000	0,000	0,000	0,000	4,100	Glass
15.	Fluorescent tubes and other wastes containing mercury	20 01 21*	t	0,130	0,005	0,137	0,017	0,000	0,289	Waste fluorescent lamps
16.	Batteries and accumulators included in 16 06 01, 16 06 02 or 16 06 03 and unsorted batteries and accumulators containing these batteries	20 01 33*	t	8,020	0,000	8,645	0,026	0,000	16,691	Waste lead - acid batteries
	Led batteries	16 06 01*								
17.	Discarded electrical and electronic equipment containing hazardous components	20 01 35*	t	59,700	1,377	2,193	0,677	0,128	64,075	Waste electrical and electronic equipment and parts
	Discarded equipment containing dangerous components other than those mentioned in 16 02 09 to 16 02 12	16 02 13*								
18.	Wood other than that specified in 20 01 37	20 01 38	t	0,200	0,230	0,000	0,000	0,000	0,430	Waste wood and plywood
			t	1.758,020	0,000	0,000	0,000	0,000	1.758,020	Wood waste removed from the Danube river

Branch of HPP "Đerdap" for waste generated during the year within the hydroelectric power plant facilities temporarily stores and sells it to authorized operators, in accordance with the Rulebook on storage, packaging and labeling of hazardous waste "Official Gazette of RS", No. 92/10 of 05.12.2010), Rulebook on categories, testing and classification of waste ("Official Gazette of RS", No. 56/10 of 10.08.2010), Rulebook on conditions and manner of collection, mode of transport, storage and treatment of waste used as a secondary raw material or for energy production ("Official Gazette of RS", No. 98/10 of 24.12.2010), Rulebook on conditions, manner and procedure of waste oil management ("Official Gazette of RS", No. 71/10 of 4 October 2010) and the Decree on the Manner and Procedures of Asbestos-Containing Waste Management ("Official Gazette of the RS", No. 74/10 of 15 October 2010). are shown in Table 109.

Table 109

HPP Djerdap Branch										
Taken quantities of waste in 2021										
No	Ordinance on categories, testing and classification of waste ("Official Gazette of RS" No. 56/2010, 93/2019 and 39/2021)		Unit	Object					Total	Note
				HPP Djerdap 1	HPP Djerdap2	HPP Pirot	Vlasinske HPP	SOP Pozarevac		
	Name	Code		Quantity						
1.	Wooden packaging	15 01 03	t	49,180	0,000	0,000	0,000	0,000	49,180	
2.	Copper, bronze, brass	17 04 01	t	0,000	0,000	0,000	0,000	0,000	0,000	Brass waste
				0,000	0,000	0,000	0,000	0,000	0,000	Bronze scrap
				38,629	0,000	0,000	0,000	0,000	38,629	Copper waste
3.	Aluminum	17 04 02	t	0,520	0,000	0,000	0,000	0,000	0,520	Aluminum scrap
4.	Iron and steel	17 04 05	t	494,530	0,000	0,000	0,000	0,000	494,530	Sheet metal waste
				7,510	0,000	0,000	0,000	0,000	7,510	Metal sawdust waste
				628,060	0,000	0,000	0,000	0,000	628,060	Iron waste
				0,000	0,000	0,000	0,000	0,000	0,000	Stainless steel
				0,000	0,000	0,000	0,000	0,000	0,000	Stainless steel waste
				0,000	0,000	0,000	0,000	0,000	0,000	Cable waste
5.	Cables other than those mentioned in 17 04 10	17 04 11	t	0,000	0,000	0,000	0,000	0,000	0,000	Copper cable waste
			t	0,000	0,000	0,000	0,000	0,000	0,000	Aluminum cable scrap

6.2.4. Environmental Noise Measurements

Noise in the environment (in the vicinity of electric power facilities that are part of HPP "Đerdap") has not been measured, due to the fact that the facilities are dislocated from the settlement and as such do not endanger the environment.

6.3. Working Environment Monitoring, Occupational Health and Safety

The reports on occupational safety and health for 2021 include the following elements:

- **Working environment monitoring**
 - Measurement of noise in the working environment
- **Occupational safety**
 - employee training
 - work injuries
- **Health care**

6.3.1. Working Environment Monitoring

▪ Environmental Noise Measurement

Training of employees for safe and healthy work is done according to the Training Program, theoretically and practically. The types of trainings conducted in 2021 were:

6.3.2. Occupational Safety

▪ Employee training

Training of employees for safe and healthy work is done according to the Training Program, theoretically and practically. The types of trainings conducted in 2021 were:

- Training of employees for safety and health at work 120
- Visitor training 152
- Fire protection training 36
- Training of employees with contractors (procedure O.0.IMS.0.8.5.1.0.2) 517
- Training of students in practical classes 22
- Training for safe work with work equipment2
- IMS training.....303

Getting acquainted with the dangers and hazards, ie risk factors in the Branch of HPP "Djerdap" - is done in accordance with the Rulebook on safety and health at work and the Act on Risk Assessment. A special agreement is concluded with the contractors regarding the application of prescribed safety and health measures at work when performing works in the common work space, in accordance with the law.

The number of employees for whom training in the field of safety and health at work was provided is given in Table 110.

Table 110.

HPP DJERDAP BRANCH					
Employee training in 2021					
Organizational Unit	Number of employees	For training		Trained	
		No	%	No	%
Organizational Unit	341	0	0,00	0	0,00
XE Ђердап 2	203	203	100,00	25	12,32
HPP DJERDAP 1	37	35	94,59	34	97,14
HPP DJERDAP 2	103	59	57,28	59	100,00
HPP PIROT	76	23	30,26	23	100,00
HPP VLASINSKE	760	320	42,11	141	44,06

▪ Work injuries

The number of injuries at work in 2021 is given in Table 111.

Table 111

HPP DJERDAP BRANCH						
Injuries at work in 2021						
Organizational Unit	No of employees	Injuries in relation to the number of employees				
		Light	Heavy	Mortal	Total	%
HPP DJERDAP 1	341	0	0	0	0	0,00
HPP DJERDAP 2	203	0	1	0	1	0,49
HPP PIROT	37	0	0	0	0	0,00
HPP VLASINSKE	103	1	0	0	1	0,97
SOP POZAREVAC I DMR BEOGRAD	76	0	0	0	0	0,00
TOTAL: HPP DJERDAP BRANCH	760	1	1	0	2	0,26

6.3.3. Health Protection

During 2021, periodic medical examinations were performed for employees in the Branch of HPP "Đerdap". The data are shown in Table 112. The medical examinations shall be conduct in 2022.

Table 112

HPP DJERDAP BRANCH											
Working capacity of employees in 2021											
Organizational Unit	No of employees	Periodic inspection				For work					
		Sent to review		Reviewed		Capable		Limitedly capable		Incapable	
		No	%	No	%	No	%	No	%	No	%
HPP DJERDAP 1	341	0	0,00	0	0,00	0	0,00	0	0,00	0	0,00
HPP DJERDAP 2	203	0	0,00	0	0,00	0	0,00	0	0,00	0	0,00
HPP PIROT	37	0	0,00	0	0,00	0	0,00	0	0,00	0	0,00
HPP VLASINSKE	103	0	0,00	0	0,00	0	0,00	0	0,00	0	0,00
SOP POZAREVAC I DMR BEOGRAD	76	0	0,00	0	0,00	0	0,00	0	0,00	0	0,00
TOTAL: HPP DJERDAP BRANCH	760	0	0,00	0	0,00	0	0,00	0	0,00	0	0,00

6.4. Public Submissions

There were no environmental submissions from the public in 2021.

7. DRINSKO-LIMSKE HPPS BRANCH

The Drinsko-Limske HPPs Branch comprises the following hydropower plants:

BAJINA BAŠTA HPPs:

- **Bajina Bašta HPP**
- **Bajina Bašta PSHPP**
- **Vrelo SHPP**

ZVORNIK HPP:

- **Zvornik HPP**
- **Radaljska Banja SHPP**

ELEKTROMORAVA HPPs:

- **Međuvršje HPP**
- **Ovčar Banja HPP**

LIMSKE HPPs:

- **Uvac HPP**
- **Kokin Brod HPP**
- **Bistrica HPP**
- **Potpeć HPP**

7.1. Overview and Status of Permits

Overview and status of permits, licences and other necessary approvals as well as applications for obtaining new ones or extending the valid permits and approvals in 2021 are shown in Table 113.

Table 113

DRINSKO-LIMSKE HPPS BRANCH			
Overview and Status of Permits in 2021			
Facility	Obtained permits and approvals (number and date)	Applications for obtaining new ones or extending the valid permits	Note
BAJINA BAŠTA HPPS			
Bajina Bašta HPP	<p>Location conditions for construction of a pipeline from the top T-11 to the reservoir Golubac and a pipeline from the reservoir Golubac to the settlement Kaludjerske Bare, on cadastral parcels No. 1773/4, 2038, 2028/1, 1773/6, 1773/2 and 2028/3, all in CM Mala Reka, municipality Bajina Bašta, class G, classification number 221210, No. ROP-BBA-12619-LOC-1/2021 as of 22.11.2021.</p> <p>Location conditions for construction of a water line Bjeluša – Gaj, on cadastral parcels No. 190/1, 6596, 179/3, 6548/1, 385, 388/3, 342, 341/2, 340/1, 1770, 1761/5, 1763 and 1664/6, all CM Zaovine, class G, classification number 221210, No. ROP-BBA-28129-LOC-1/2021 as of 21.10.2021.</p>	<p>Application for issuing a decision on approving execution of works on investment maintenance of the office building for the purpose of maintaining DOT (Article 145, Law on planning and construction) No. ROP-MSGI-44240-ISAW-1/2021, as of 10.12.2021.</p> <p>Application for issuing location conditions for reconstruction of the sewage system ROP-BBA-11311-LOC-1/2021 as of 20.4.2021.</p>	-

DRINSKO-LIMSKE HPPS BRANCH			
Overview and Status of Permits in 2021			
Facility	Obtained permits and approvals (number and date)	Applications for obtaining new ones or extending the valid permits	Note
	Location conditions for reconstruction of the sewage system ROP-BBA-11311-LOC-1/2021 as of 16.9.2021.		
Bajina Bašta PSHP	No new permits obtained in 2021.	No new applications.	-
Vrelo SHPP	No new permits obtained in 2021.	No new applications.	-
ELEKTROMORAVA HPPS			
Ovčar Banja HPP	Water permit for the Elektromorava HPPs dam and reservoir operation mode, No. 325-04-00725/220-07 as of 16.04.2021. Correction of the Water permit decision No. 325-04-725/2020-07 as of 27.05.2021, referring to the change of the Applicant's name.	Application for issuing location conditions for reconstruction of the sewage system ROP-MSGI-26004-LOCH-1/2021 as of 19.8.2021.	-
Međuvršje HPP	Water permit for the Elektromorava HPPs dam and reservoir operation mode. No. 325-04-00725/220-07 as of 16.04.2021. Correction of the Water permit decision No. 325-04-725/2020-07 as of 27.05.2021, referring to the change of the Applicant's name. Location conditions for reconstruction of the sewage system No: 350-02-01493/2021-7.	Application for issuing location conditions ROP-MSGI-22209-LOC/2021 as of 14.07.2021.	-
ZVORNIK HPP			
Zvornik HPP	Water permit 325-04-00353/2021-07 as of 28.04.2021. Location conditions for reconstruction of the sewage system No: 353-26/2021 as of 25.11.2021.	Application for issuing location conditions for reconstruction of the sewage system ROP-MZV-20093-LOCH-2/2021 as of 21.9.2021.	-
Radaljska Banja SHPP	Water permit 5389 as of 20.05.2021.	No new applications.	-
LIMSKE HPPS			
Kokin Brod HPP	Decision on legalization of the reservoir for raw water supply to the hydro power plant, No.: 351-22/2021-06 as of 09.08.2021. (the facility on the cad.parc.No. 645/1 CM Buradja). Location conditions for reconstruction of the sewage system No.: 350-02-01649/2021-07 as of 19.10.2021. Decision on legalization of the guard lodge No.: 351-22/2021-06 as of 09.08.2021. (the facility on the cad.parc. No.1155/2 CM Buradja).	Application for issuing location conditions as of 18.08.2021.	-
Uvac HPP	Decision on approving execution of works on investment maintenance of the Uvac dam (curtain injections) No.: 351-05-02374/2021-07 as of 03.09.2021.	Application for approving execution of works on investment maintenance of the Uvac dam as of 20.08.2021.	-

DRINSKO-LIMSKE HPPS BRANCH			
Overview and Status of Permits in 2021			
Facility	Obtained permits and approvals (number and date)	Applications for obtaining new ones or extending the valid permits	Note
	Location conditions for reconstruction of the sewage system No.: 350-02-01658/2021-07 as of 02.11.2021. Decision on legalization of the reservoir for raw water supply to the hydro power plant No.: 351-99/2021-10 as of 12.05.2021 (the facility on the cad.parc. No. 459/1 CM Komarani).	Application for issuing location conditions as of 18.08.2021.	
Bistrica HPP	Location conditions for reconstruction of the sewage system No.: 350-02-01637/2021-07 as of 10.11.2021. Decision on legalization of the reservoir for raw water supply to the hydro power plant No.: 351-83/2021-10 as of 21.04.2021 (the facility on the cad.parc. No. 1557/3 CM Bistrica).	Application for issuing location conditions as of 18.08.2021.	-
Potpeć HPP	Location conditions for reconstruction of the sewage system No.: 350-02-01666/2021-07 as of 22.10.2021. Decision on legalization of the reservoir for raw water supply to the hydro power plant No.: 351-1/2021 as of 18.02.2021 (the facility on the cad.parc. No. 4579/1 CM Banja). Decision on legalization of the split water shaft No.: 351-2/2021 as of 18.02.2021 (the facility on the cad.parc. No. 4579/4 CM Banja).	Application for issuing location conditions as of 26.08.2021.	-
Miscellaneous	Decision on legalization of the reservoir for raw water supply to mechanical workshop in Bistrica No.: 351-22/2021-06 as of 09.08.2021. (the facility on the cad.parc. No. 4592/2 CM Bistrica).	No new applications.	-

7.2. Monitoring and Environmental Impact

In 2021, Drinsko – Limske HPPs Branch had the re-certification audit according to the requirements of the ISO standard 14001: 2015. The re-certification audit was performed on between 13th and 15th December 2021. The results have shown that Drinsko – Limske HPPs Branch continuously maintain and improve their integrated management system in accordance with the ISO 9001:2015, ISO 14001:2015 and ISO 45001:2018 standards' requirements.

The successful audit was performed by Bureau Veritas France.

In the period 21st – 23rd December 2021, the second control audit *EnMS – Energy management system ISO 50001:2018 (Energy efficiency)* was performed.

The successful audit was performed by SGS (*Systems & Services Certification Zurich - Switzerland*).

7.2.1. Identified Negative Impacts on the Flow and Ecological System under the Accumulation

The identified negative impacts in the flows downstream the dams are mainly twofold: with very low water levels (low discharge) caused by annual climate and meteorological conditions and otherwise, when there are very large inflows, there is a tendency to realize transfer of hydro power with as higher as possible efficiency through the planning of electricity production.

7.2.2. Water

- **Water amounts**

Utilization of water for hydropower generation, process and sanitary water was performed within permitted amounts. Amounts of permitted and amounts of water used for electricity generation, as well as amounts of water discharged after electricity generation in 2021 are provided in Table 114.

Table 114

DRINSKO-LIMSKE HPPS BRANCH							
Water amounts in 2021							
Facility	No. of units	Permitted water amounts (Installed discharge per unit) m ³ / s	Discharged water amounts				
			Water used for electricity generation in 2021. m ³ / year x 10 ⁶	Process water m ³ / year x 10 ⁶	Sanitary water m ³ / year x 10 ³	Total discharged water m ³ / year x 10 ⁶	
BAJINA BAŠTA HPP	4	175	12.392	0,000	21,980	12.922	
BAJINA BAŠTA PSHPP	2	55	530	0,000	0,000	0,000	
Vrelo SHPP	1	0,74	0,000	0,000	0,000	0,000	
ZVORNIK HPP	4	170	12.322	0,161	2,41	12.322,16	
Radaljska Banja SHPP	1	0,400	0,000	0,000	0,000	0,000	
ELEKTROMORAVA HPP	Međuvršje HPP	3	I-19,5 II-30 III-3,75	717,765	0,00827649	6,505	717,77978194
	Ovčar Banja HPP	2	I-19,5 II-30	673,216	0,00591444	6,274	673,22818844
LIMSKE HPPS	Uvac HPP	1	43	363,055	0,386	0,2	363,441
	Kokin Brod HPP	2	18,7	527,918	2,028	0,2	529,946
	Bistrica HPP	2	18	560,014	3,296	0,3	564,014
	Potpeć HPP	3	55	2.536,949	5,061	0,3	2.542,010

- **Water quality**

Pursuant to the contractual obligations regarding the control management of wastewater and surface water from the riverflows and accumulations, Occupational Safety Institute in 2021 conducted the sampling of waste and surface waters from all power plants operating within the Drinsko – Limske HPPs Branch.

The sampling was made for three quarters of 2021. The following number of samples was taken: Bajina Bašta HPP 11 samples, Limske HPPs 12 samples, Elektromorava HPP 6 samples and Zvornik HPP 3 samples as follows:

- wastewater sample
- surface water sample upstream from the facility
- surface water sample downstream from the facility

The water samples were chemically and biologically analysed, while the results were interpreted in accordance with Regulation on stipulating pollutants limit values in surface and ground waters and sediments, and the deadlines for their achievement (OG RS № 50/2012), Regulation on stipulating hazardous substances in water (OG RS № 31/1982), Water Classification Regulation and Watercourse Categorisation Regulation (OG SFRY № 5/1968). The wastewater and surface water quality test results are presented in Table 115.

Table 115

DRINSKO – LIMSKE HPPs BRANCH															
Water quality in 2021															
Facility	Testing parameters (unit)	Wastewater and surface water quality testing results for 2021												Reference values	Test results comment and conclusion (Comment on chemical and bacteriological analysis of the samples from the sewage system and surface water upstream and downstream of the facility and its impact on water class defined by Water Classification Regulation)
		1 st quarter			2 nd quarter			3 rd quarter			4 th quarter				
		From the sewage system before discharge	Surface water upstream from the facility	Surface water downstream from the facility	From the sewage system before discharge	Surface water upstream from the facility	Surface water downstream from the facility	From the sewage system before discharge	Surface water upstream from the facility	Surface water downstream from the facility	From the sewage system before discharge	Surface water upstream from the facility	Surface water downstream from the facility		
BAJINA BAŠTA HPP	MPN coliform bacteria (E.coli/100 ml)	-	2x10 ²	2x10 ²	-	<1x10 ²	<1x10 ²	-	7,2x10 ²	3,6x10 ⁴	-	3,5x10 ²	1,5x10 ²	-	The Drina River belongs to Class II. The tested parameters meet the values defined by the Regulation.
	Dissolved O ₂ (mg/l)	6,67	10,32	10,20	1,46	7,47	7,74	4,91	8,35	7,94	4,45	8,74	8,76	min. 7,0	
	Suspended substances (mg/l)	<1	<1	<1	<1	<1	<1	15,20	<1	<1	6,4	<1	<1	25	
	COD (mg/l)	10,3	<4	<4	14	<4	<4	20	<4	<4	18	<4	<4	15	
	BOD ₅ (mg/l)	1,1	<0,5	0,9	25,81	<0,5	<0,5	16	<0,5	<0,5	14	<0,5	<0,5	5	
	pH value	7,78	8,13	8,13	7,42	8,25	8,06	7,65	8,12	7,87	7,50	7,89	7,99	6,8-8,5	
	Total oil and grease (mg/l)	-	-	-	-	-	-	-	-	-	-	-	-	-	
ZVORNIK HPP	MPN coliform bacteria (E.coli/100 ml)	-	4,3x10 ³	4,7x10 ³	-	2,3x10 ³	1,2x10 ³	-	6,3x10 ²	5,9x10 ⁴	-	1,4x10 ²	1,4x10 ³	-	The Drina River belongs to Class II. The tested parameters meet the values defined by the Regulation.
	Dissolved O ₂ (mg/l)	-	10,07	10,42	-	7,18	7,79	-	8,09	8,11	-	8,87	9,08	min. 7,0	
	Suspended substances (mg/l)	-	1,6	1,2	-	<1	<1	-	<1	<1	-	15,6	16	25	
	COD (mg/l)	-	4,2	<4	-	<4	<4	-	<4	<4	-	<4	<4	15	
	BOD ₅ (mg/l)	-	0,90	0,8	-	0,81	0,73	-	0,80	0,72	-	0,90	0,80	5	
	pH value	-	8,18	8,19	-	8,02	8,09	-	8,06	8,11	-	8,02	8,00	6,8-8,5	

DRINSKO – LIMSKE HPPs BRANCH															
Water quality in 2021															
Facility	Testing parameters (unit)	Wastewater and surface water quality testing results for 2021												Reference values	Test results comment and conclusion (Comment on chemical and bacteriological analysis of the samples from the sewage system and surface water upstream and downstream of the facility and its impact on water class defined by Water Classification Regulation)
		1 st quarter			2 nd quarter			3 rd quarter			4 th quarter				
		From the sewage system before discharge	Surface water upstream from the facility	Surface water downstream from the facility	From the sewage system before discharge	Surface water upstream from the facility	Surface water downstream from the facility	From the sewage system before discharge	Surface water upstream from the facility	Surface water downstream from the facility	From the sewage system before discharge	Surface water upstream from the facility	Surface water downstream from the facility		
	Total oil and grease (mg/l)	-	-	-	-	-	-	-	-	-	-	-	-	-	
OVČAR BANJA HPP	MPN coliform bacteria (E.coli/100 ml)	-	1,2 x10 ⁴	3,8 x10 ⁴	-	3,5 x10 ³	4x10 ³	-	4x10 ²	1 x10 ³	-	1,4x10 ⁴	1,1 x10 ⁴	-	
	Dissolved O ₂ (mg/l)	-	9,84	10,14	-	4,27	5,08	-	7,98	7,43	-	7,89	8,19	min. 7,0	
	Suspended substances (mg/l)	-	<1	<1	-	15	23	-	20,40	18,4	-	176	136	25	The Zapadna Morava belongs to Class II. The tested parameter of the suspended substances in the fourth quarter does not meet the values defined by the Regulation.
	COD (mg/l)	-	5,10	4,80	-	4,2	5,10	-	4,40	5	-	4,8	4,0	15	
	BOD ₅ (mg/l)	-	0,80	0,90	-	0,95	1,12	-	2,046	2,435	-	0,96	0,82	5	
	pH value	-	7,97	7,95	-	7,53	7,58	-	7,75	7,71	-	7,71	7,75	6,8-8,5	
	Total oil and grease (mg/l)	-	-	-	-	-	-	-	-	-	-	-	-	-	
MEĐUVRŠJE HPP	MPN coliform bacteria (E.coli/100 ml)	-	1,5 x10 ³	2,5 x10 ³	-	1,3x10 ³	9x10 ³	-	4 x10 ⁴	1,4 x10 ⁴	-	3 x10 ⁴	2,7 x10 ⁴	-	
	Dissolved O ₂ (mg/l)	-	9,37	9,42	-	5,54	5,69	-	7,39	7,77	-	8,12	8,41	min. 7,0	The Zapadna Morava belongs to Class II. The tested parameter of the suspended substances in the fourth quarter does not meet the values defined by the Regulation.
	Suspended substances (mg/l)	-	<1	<1	-	6	8	-	<1	<1	-	81,60	65,60	25	
	COD (mg/l)	-	4	5	-	4	5,20	-	3,50	4,80	-	5,00	3,30	15	

DRINSKO – LIMSKE HPPs BRANCH															
Water quality in 2021															
Facility	Testing parameters (unit)	Wastewater and surface water quality testing results for 2021												Reference values	Test results comment and conclusion (Comment on chemical and bacteriological analysis of the samples from the sewage system and surface water upstream and downstream of the facility and its impact on water class defined by Water Classification Regulation)
		1 st quarter			2 nd quarter			3 rd quarter			4 th quarter				
		From the sewage system before discharge	Surface water upstream from the facility	Surface water downstream from the facility	From the sewage system before discharge	Surface water upstream from the facility	Surface water downstream from the facility	From the sewage system before discharge	Surface water upstream from the facility	Surface water downstream from the facility	From the sewage system before discharge	Surface water upstream from the facility	Surface water downstream from the facility		
DRINSKO – LIMSKE HPPs BRANCH	BOD ₅ (mg/l)	-	0,80	0,90	-	0,74	0,95	-	0,50	0,60	-	0,63	0,47	5	
	pH value	-	7,89	7,86	-	7,66	7,58	-	7,65	7,94	-	7,75	7,71	6,8-8,5	
	Total oil and grease (mg/l)	-	-	-	-	-	-	-	-	-	-	-	-	-	
UVAC HPP	MPN coliform bacteria (E.coli/100 ml)	-	2x10 ²	1x10 ²	-	1,5x10 ³	5,3x10 ³	-	4,2x10 ³	3,5x10 ³	-	1,2x10 ³	62	-	The Uvac River belongs to Class II. The tested parameters meet the values defined by the Regulation.
	Dissolved O ₂ (mg/l)	-	9,97	8,84	-	6,82	7,71	-	7,47	8,88	-	7,93	7,86	min. 7,0	
	Suspended substances (mg/l)	-	<0,1	<0,1	-	<1	34	-	<1	21,6	-	<1	74,4	25	
	COD (mg/l)	-	5,20	4,80	-	<4	4,20	-	<4	4,30	-	<4	4,5	15	
	BOD ₅ (mg/l)	-	0,90	0,80	-	0,84	0,85	-	0,76	0,80	-	0,8	0,83	5	
	pH value	-	8,01	7,79	-	8,27	7,76	-	8,04	7,85	-	6,7	6,4	6,8-8,5	
	Total oil and grease (mg/l)	-	-	-	-	-	-	-	-	-	-	-	-	-	
KOKIN BROD HPP	MPN coliform bacteria (E.coli/100 ml)	-	<1 x10 ²	<1 x10 ²	-	2x10 ²	<1x10 ²	-	2x10 ²	1x10 ⁴	-	94	50	-	The Uvac River belongs to Class II. The tested parameters meet the values defined by the Regulation.
	Dissolved O ₂ (mg/l)	-	9,76	9,93	-	5,75	6,43	-	8,34	7,75	-	8	8,49	min. 7,0	

DRINSKO – LIMSKE HPPs BRANCH															
Water quality in 2021															
Facility	Testing parameters (unit)	Wastewater and surface water quality testing results for 2021												Reference values	Test results comment and conclusion (Comment on chemical and bacteriological analysis of the samples from the sewage system and surface water upstream and downstream of the facility and its impact on water class defined by Water Classification Regulation)
		1 st quarter			2 nd quarter			3 rd quarter			4 th quarter				
		From the sewage system before discharge	Surface water upstream from the facility	Surface water downstream from the facility	From the sewage system before discharge	Surface water upstream from the facility	Surface water downstream from the facility	From the sewage system before discharge	Surface water upstream from the facility	Surface water downstream from the facility	From the sewage system before discharge	Surface water upstream from the facility	Surface water downstream from the facility		
BISTRICA HPP	Suspended substances (mg/l)	-	<1	<1	-	0,8	<1	-	<1	<1	-	<1	<1	25	The Uvac River belongs to Class II. The tested parameters meet the values defined by the Regulation.
	COD (mg/l)	-	<4	<4	-	<4	<4	-	<4	<4	-	<4	<4	15	
	BOD ₅ (mg/l)	-	0,8	<0,5	-	0,76	0,81	-	0,62	0,78	-	0,6	0,8	5	
	pH value	-	8,06	8,02	-	7,95	7,96	-	8,26	7,63	-	7,73	7,85	6,8-8,5	
	Total oil and grease (mg/l)	-	-	-	-	-	-	-	-	-	-	-	-	-	
	MPN coliform bacteria (E.coli/100 ml)	-	3x10 ²	4x10 ²	-	<1x10 ²	2,2x10 ³	-	1,8x10 ⁴	3,4x10 ³	-	81	1,4x10 ²	-	
Dissolved O ₂ (mg/l)	-	9,90	10,21	-	7,15	3,95	-	7,80	7,92	-	8,47	8,58	min. 7,0		
BISTRICA HPP	Suspended substances (mg/l)	-	<0,1	<0,1	-	<1	42	-	<1	<1	-	<1	<1	25	The Uvac River belongs to Class II. The tested parameters meet the values defined by the Regulation.
	COD (mg/l)	-	<4	4,2	-	<4	4,5	-	4,6	<4	-	4,8	<4	15	
	BOD ₅ (mg/l)	-	0,9	0,9	-	0,95	0,98	-	1,01	0,80	-	1,1	0,78	5	
	pH value	-	8,08	8,02	-	8,32	7,71	-	7,89	7,89	-	7,82	7,79	6,8-8,5	
	Total oil and grease (mg/l)	-	-	-	-	-	-	-	-	-	-	-	-	-	

DRINSKO – LIMSKE HPPs BRANCH															
Water quality in 2021															
Facility	Testing parameters (unit)	Wastewater and surface water quality testing results for 2021												Reference values	Test results comment and conclusion (Comment on chemical and bacteriological analysis of the samples from the sewage system and surface water upstream and downstream of the facility and its impact on water class defined by Water Classification Regulation)
		1 st quarter			2 nd quarter			3 rd quarter			4 th quarter				
		From the sewage system before discharge	Surface water upstream from the facility	Surface water downstream from the facility	From the sewage system before discharge	Surface water upstream from the facility	Surface water downstream from the facility	From the sewage system before discharge	Surface water upstream from the facility	Surface water downstream from the facility	From the sewage system before discharge	Surface water upstream from the facility	Surface water downstream from the facility		
POTPEĆ HPP	MPN coliform bacteria (E.coli/100 ml)	-	1,6x10 ⁴	1,6x10 ⁴	-	<1x10 ²	4,7x10 ⁴	-	2,1x10 ⁴	1,5x10 ⁴	-	1,2 x10 ⁴	1,1x10 ⁴	-	The Lim River belongs to Class II. The tested parameters meet the values defined by the Regulation.
	Dissolved O ₂ (mg/l)	-	10,26	9,99	-	7,55	6,74	-	7,35	8,12	-	8,63	8,99	min. 7,0	
	Suspended substances (mg/l)	-	<1	<1	-	0,8	<1	-	15,2	<1	-	18,40	14,80	25	
	COD (mg/l)	-	<4	4,50	-	4,50	4,60	-	5,20	4,90	-	5,10	5	15	
	BOD ₅ (mg/l)	-	0,90	1	-	0,87	0,98	-	0,97	0,85	-	0,90	0,91	5	
	pH value	-	8,14	8,12	-	8,21	7,79	-	7,72	8,02	-	7,89	7,88	6,8-8,5	
	Total oil and grease (mg/l)	-	-	-	-	-	-	-	-	-	-	-	-	-	

Water quality control for Vrelo SHPP and Radaljska Banja SHPP was not carried out in the Drinsko-Limske HPPs Branch, since for their size and structure they are not able to produce waste water.

7.2.3. Waste

Waste at the Drinsko – Limske HPPs Branch is mostly produced in the process of hydro power plants maintenance. The generated waste in 2021 is shown in the Table 116.

Table 116

DRINSKO-LIMSKE HPPS BRANCH									
Generated waste types in 2021									
No	Official nomenclature of the Rules defining waste categories, its testing and classification (OG RS № 56/2010, 93/2019 and 39/2021)		Unit (t)	Objekat				Total	Note
				Bajina Bašta HPP and PSHPP	LIMSKE HPPs	Elektromorava HPP	Zvornik HPP		
	Name	Index number		Amounts					
1.	Waste tires	16 01 03	t	0,000	0,000	1,000	0,000	1,000	Waste tires
2.	Discarded equipment other than the one indicated under 16 02 09 to 16 02 13	16 02 14	t	0,000	24,030	0,740	0,000	24,77	Waste insulators
3.	Discarded equipment other than the one indicated under 16 02 09 to 16 02 13	16 02 14	t	0,000	0,450	0,000	0,000	0,450	Waste transformer
4.	Components removed from the discarded equipment other than those under 16 02 15	16 02 16	t	0,000	0,380	0,000	0,000	0,380	Electronic waste non-hazardous
5.	Aluminum	17 04 02	t	0,000	0,420	0,000	0,000	0,420	Aluminium
6.	Iron and steel	17 04 05	t	0,000	17,190	2,420	0,000	19,61	Waste iron
7.	Iron and steel	17 04 05	t	0,000	0,000	0,460	0,000	0,460	Waste veneer
8.	Iron and steel	17 04 05	t	0,000	0,210	0,000	0,000	0,210	Waste wire
9.	Discarded electronic and electrical equipment which contains hazardous components	20 01 35*	t	0,000	0,080	0,000	0,000	0,080	Electronic waste hazardous

Waste management was performed following the waste management procedures and according to the following waste handling legislation: Regulation on method of storage, packaging and labeling hazardous waste "Official Gazette of RS", No. 92/10 dated 05.12.2010; Regulation on categories, testing and classification of waste ("Official Gazette of the Republic of Serbia", No. 56/10 dated 10.08.2010); Regulation on the conditions and methods of collection, transport, storage and treatment of waste used as secondary raw material or for energy generation ("Official Gazette of the Republic of Serbia", No. 98/10 dated 24.12.2010); Regulation on waste oils management methods ("Official Gazette of the Republic of Serbia", No. 71/10 dated 04.10.2010) and Regulation on manner and procedures for waste management containing asbestos ("Official Gazette of the Republic of Serbia" No. 74/10 dated 15.10. 2010).

The waste generated in Drinsko – Limske HPP Branch was tested – the categorization of waste was done. During the year, the collected waste is stored within the plants and delivered to the authorized companies registered for such activity. The delivered waste in 2021 is shown in the Table 117.

Table 117

DRINSKO – LIMSKE HPPS BRANCH									
Delivered waste in 2021									
No.	Official nomenclature of the Rules defining waste categories, its testing and classification OG RS № 56/2010, 93/2019 and 39/2021)		Unit (t)	Објекат				Total	Note
				Bajina Bašta HPP and PSHP	Limske HPPs	Elektromorava HPP	Zvornik HPP		
	Name	Index number		Amounts					
1.	Waste tires	16 01 03	t	0,000	0,000	1,000	0,000	1,000	Waste tires
2.	Discarded equipment other than the one indicated under 16 02 09 to 16 02 13	16 02 14	t	0,000	24,030	0,740	0,000	24,770	Waste insulators
3.	Discarded equipment other than the one indicated under 16 02 09 to 16 02 13	16 02 14	t	0,000	0,450	0,000	0,000	0,450	Waste transformer
4.	Components removed from the discarded equipment other than those under 16 02 15	16 02 16	t	0,000	0,380	0,000	0,000	0,380	Electronic waste non-hazardous
5.	Aluminum	17 04 02	t	0,000	0,420	0,000	0,000	0,420	Aluminium
6.	Iron and steel	17 04 05	t	0,000	17,190	2,420	0,000	19,61	Waste iron
7.	Iron and steel	17 04 05	t	0,000	0,000	0,460	0,000	0,460	Waste veneer
8.	Iron and steel	17 04 05	t	0,000	0,210	0,000	0,000	0,210	Waste wire
9.	Discarded electronic and electrical equipment which contains hazardous components	20 01 35*	t	0,000	0,080	0,000	0,000	0,080	Electronic waste hazardous

7.2.4. Environmental Noise Measurement

Environmental noise measurements nearby the electric power facilities were not performed in 2021, because they are dislocated from the settlement and as such do not represent a risk factor for the environment from this aspect.

7.3. Working Environment Monitoring, Occupational Safety and Health Protection

Occupational Safety and Health Protection Reports in 2021 include the following elements:

- **Working Environment Monitoring**
 - Noise measurements in the working environment
- **Occupational Safety**
 - Training of employees
 - Occupational injuries
- **Health Protection**

7.3.1. Working Environment Monitoring

- **Environmental Noise Measurement**

Within working environment tests, physical and microclimate parameters, noise measurements in the working environment were executed in all Drinsko-Limske HPPs facilities, during regular periodic inspections for winter 2021.

Bajina Bašta HPP, Perućac: Of total 90 locations where noise measurements were done, the measured values on 12 locations exceeded limit values defined by the Regulation on preventive measures for safe and healthy works during exposure (Official Gazette RS, No. 96/2011, 78/2015 and 93/2019).

Zvornik HPP, Mali Zvornik: Of total 40 locations where noise measurements were done, the measured values on 4 locations exceeded limit values defined by the Regulation on preventive measures for safe and healthy works during exposure (Official Gazette RS, No. 96/2011, 78/2015 and 93/2019)

ELEKTROMORAVA HPP, Čačak (Ovčar Banja HPP and Medjuvršje HPP): Of total 20 locations where noise measurements were done, the measured values on 6 locations exceeded limit values defined for exposure (Official Gazette RS, No. 96/2011, 78/2015 and 93/2019).

LIMSKE HPPs, Nova Varoš (Kokin Brod HPP, Uvac HPP, Bistrica HPP and Potpeć HPP): Of total 54 locations where noise measurements were done, the measured values on 15 locations exceeded limit values defined for exposure (Official Gazette RS, No. 96/2011, 78/2015 and 93/2019).

Measuring locations where the measured values exceeded the limit values are provided in Table 118.

Table 118

DRINSKO – LIMSKE HPPS BRANCH					
Working environment noise in 2021					
Branch		Section	Registered noise level (dB(A))	Admissible noise level (dB(A))	
Facility					
Drina HPP	Bajina Bašta HPP	Generator area	83	85	
		Turbine area	85	85	
		Mechanical workshop	95	85	
		Diesel unit	100	85	
	Bajina Bašta PSHP	FP TARA Pump plant	82	80	
		PP DJURICI – Pump drive	98	85	
		Generator area	89	85	
		Turbine area	89	85	
	Zvornik HPP	Compressor station	88	85	
		Ball valve	91	85	
		Production plant – turbine area, at Turbine 3 entrance	118	85	
		Production plant right bank – turbine area, cooling system	113	85	
	EMHPPs	Ovčar Banja HPP	Production plant – turbine area, Turbine 2 entrance	107	85
			Production plant, left bank – turbine area, cooling system	104	85
			Turbine area	90	85
Medjuvršje HPP		Mechanical workshop	90	85	
		Control room	62	60	
		Power house	87	85	
		Turbine area B 1 between turbines	95	85	
Lim HPP	Kokin Brod HPP	B 3 auxiliary generator	98	85	
		Turbine A area	96	85	
	Uvac HPP	Turbine B area	95	85	
		Turbine area	98	85	
		Generator pit	93	85	
		Power house	86	85	
		Control room	61	55	
	Bistrica HPP	Power house	89	85	
		Busbars distribution area	92	85	
		Compressor station surrounding area	92	85	

DRINSKO – LIMSKE HPPS BRANCH				
Working environment noise in 2021				
Branch		Section	Registered noise level (dB(A))	Admissible noise level (dB(A))
Facility				
	Potpeć HPP	Turbine area	95	85
		Machining workshop	95	85
		Carpenter workshop	94	85
		Power house	88	85
		Turbine area	95	85
		Busbars distribution area	87	85

7.3.2. Occupational Safety

▪ Training of employees

Employee training has been conducted under the Training program and complementing the knowledge of employees from occupational safety is performed periodically depending on the workplace, which is in compliance with the applicable legal regulations. The number of employees scheduled for training and the number of employees who have been trained is shown in Table 119.

Table 119

DRINSKO – LIMSKE HPPS BRANCH					
Training of employees in 2021					
Facility	Number of employees	For training		Trained	
		No.	%	No.	%
Bajina Bašta HPP	215	86	40,00	86	100,00
Bajina Bašta PSHPP					
Elektromorava HPP	44	8	18,18	8	100,00
Zvornik HPP	58	25	43,10	25	100,00
Limske HPPs	115	115	100,00	112	97,39
TOTAL: DRINSKO – LIMSKE HPPS BRANCH	432	234	54,17	231	98,72

Table 120. gives numbers of individuals sent for other trainings.

Table 120

DRINSKO – LIMSKE HPPS BRANCH			
Other trainings in 2021			
No.	Type of training	Number of persons	Note
1.	Introducing the contractors with the dangers and hazards, OSH measures and rules of conduct	BBHPP/269 LHPP/67 ZVHPP/31 EMHPP/18 TOTAL: 385	-
2.	Training for OSH of workers engaged in auxiliary overhaul works	BBHPP/2 LHPP/70 ZVHPP/12 EMHPP/0 TOTAL: 84	-
3.	Introducing the students and pupils at practice with OSH measures and rules of conduct	BBHPP/0 LHPP/12 ZVHPP/0 EMHPP/100 TOTAL: 112	-
4.	Training of employees in case of change of workplace	BBHPP/2 LHPP/0 ZVHPP/3 EMHPP/0 TOTAL: 5	-
5.	Fire protection trainings	BBHPP/18 LHPP/112 ZVHPP/10 EMHPP/6 TOTAL: 146	

DRINSKO – LIMSKE HPPS BRANCH			
Other trainings in 2021			
No.	Type of training	Number of persons	Note
6.	Introducing the contractors with the dangers and hazards, OSH measures and rules of conduct	BBHPP/269 LHPP/67 ZVHPP/31 EMHPP/18 TOTAL: 385	-

Work injuries

Table 121 provides number data occupational injuries in 2021.

Table 121

DRINSKO – LIMSKE HPPS BRANCH						
Occupational injuries in 2021						
Facility	Number of employees	Injuries in relation to the number of employees				
		Light	Severe	Fatal	Total	%
Bajina Bašta HPP	215	4	1	0	5	2,33
Bajina Bašta RHPP						
Elektromorava HPP	44	0	0	0	0	0,00
Zvornik HPP	58	0	0	0	0	0,00
Limske HPPs	115	1	1	0	2	1,74
TOTAL: DRINSKO – LIMSKE HPPS BRANCH	432	5	2	0	7	1,62

7.3.3. Health Protection

Medical examinations results are provided in Table 122.

Table 122

DRINSKO – LIMSKE HPPS BRANCH											
Work ability of employees in 2021											
Facility	No. of employees	Periodical examination				Work capacity					
		For medical examination		Examined		capable		Limited capability		Not capable	
		No.	%	No.	%	No.	%	No.	%	No.	%
Bajina Bašta HPP	215	67	31,16	66	98,51	43	65,15	22	33,33	1	1,52
Bajina Bašta RHPP											
Elektromorava HPP	44	3	6,82	3	100,00	3	100,00	0	0,00	0	0,00
Zvornik HPP	58	23	39,66	23	100,00	20	86,96	3	13,04	0	0,00
Limske HPPs	115	34	29,57	34	100,00	27	79,41	7	20,59	0	0,00
TOTAL: DRINSKO – LIMSKE HPPS BRANCH	432	127	29,40	126	99,21	93	73,81	32	25,40	1	0,79

7.4. Public Submissions

Public submissions 2021 are provided in Table 123.

Table 123

DRINSKO – LIMSKE HPPS BRANCH		
Public complaints in 2021		
Organization	Complaint (submitted by)	Complaint subject Actions
Bajina Bašta HPP and PSHPP	Complaint submitted by residents from Zaovine	Claim for damages due to landslides on parcels surrounding Zaovine Lake. Complaint resolving procedure is ongoing

8. RENEWABLE ENERGY SOURCES BRANCH

The Renewable Energy Sources (RES) Branch comprises the following small hydropower plants, some are in operation, whilst larger part is in the process of reconstruction.

Small hydropower plants in operation in 2021:

- Sicevo HPP
- Sokolovica HPP
- Gamzigrad HPP

Small hydropower plants that are out of operation in 2021:

- Seljašnica HPP
- Prvonek HPP
- Sveta Petka HPP
- Moravica HPP
- Turica HPP
- Pod gradom HPP
- Kratovska reka HPP
- Raška HPP
- Temac HPP
- Vučje HPP
- Jelašnica HPP
- Stanica Spasoejvić HPP
- Crna HPP
- Krasava HPP
- Manastirište HPP

According to the plans of PE EPS, HPP Gamzigrad is exempt from reconstruction (restitution proceedings initiated), small hydropower plants that are out of service at different stages of reconstruction, and the last four small hydropower plants are not currently in the reconstruction plans of PE EPS due to the state they are in at the moment.

Small HPP in constructin:

- Rovni HPP, construction has begun, the final phase of preparation of investment and technical documentation is underway;
- Čelije HPP, preparation of investment-technical documentation.

8.1. Overview and Status of Permits

Prvonek HPP has a Use permit no. 351-398/2012-07, issued on June 13, 2013, by the competent Secretariat of the City of Vranje.

Turica HPP has a Use permit no 351-597/20-02, issued on November 13, 2020, by the Department for implementation of plans and construction of Užice.

Seljašnica HPP has a Use permit no. 353-172/20, issued on October 20th, 2020 by Municipal administration of Prijepolje.

Kratovska reka HPP, in the process of obtaining of Use permit, as-built design is being prepared.

8.2. Monitoring and Environmental Impact

8.2.1. Identified Negative Impacts on the Flow and Ecological System below the Accumulation

The identified negative impacts in streams downstream the dams are mainly twofold: with very low water level (low flow rate), causing by annual climate and meteorological conditions and otherwise, when there are very large inflows, there is a tendency to realize transfer of hydro power with as higher as possible efficiency through the planning of electricity production.

8.2.2. Water

• Water quantity

Utilisation of water for hydropower generation, process and sanitary water did not exceed the permitted amounts. Amounts of permitted and amounts of water used for electricity generation, as well as amounts of water discharged after electricity generation in 2021 are provided in Table 124.

The data which are not indicated in the table are unavailable due to non-existence of relevant diagrams for calculation, of each unit individually, as well as due to impossibility of measurement or lack of measuring equipment in the listed hydropower plants.

Table 124

RENEWABLE ENERGY SOURCES BRANCH						
Water amounts in 2021						
Organizational unit	Installed power kW	Permitted water amount (installed flow per unit) m ³ /s	Discharged water amounts			
			Water used for electricity generation in 2021. m ³ /god.x10 ⁶	Technical water m ³ /god.x10 ⁶	Sanitary water m ³ /god.x10 ³	Total discharged water m ³ /god.x10 ⁶
Raška SHPP	6.256	4,50	In reconstruction			
Seljašnica SHPP	Completed reconstruction		Out of service			
Moravica SHPP	160	2,50	In reconstruction			
Turica SHPP	Completed reconstruction		Out of service			
Pod Gradom SHPP	364	2,30	In reconstruction			
Kratovska reka SHPP	In reconstruction					
Sveta Petka SHPP	In reconstruction		In reconstruction			
Sićevo SHPP	1.348	20,60	174.432	-	-	-
Temac SHPP	752	6,10	In reconstruction			
Sokolovica SHPP	3.724	40,00	420.864	-	-	-
Gamzigrad SHPP	224	4,20	49.858	-	-	-
Vučje SHPP	928	1,25	In reconstruction			
Jelašnica SHPP	400	0,42	In reconstruction			
Prvonek SHPP	932	1,45	Out of service			

• Water quality

During 2021 water quality control was not carried out in the Renewable Energy Sources Branch. SHPPs in the RES Branch for their size and structure are not able to produce waste water. Measurements of technical and sanitary water are not performed on our HPPs.

8.2.3. Waste

During 2021, the works on the reconstruction and revitalization of the parts of the power plants that were previously mentioned continued. Generated waste, as a consequence of revitalization works, is listed and properly sorted (hazardous / non-hazardous) and stored at available locations. After the procedure, part of the stored waste will be handed over to the competent services of PE EPS, for use by institutions interested in using this equipment for teaching or museum purposes, while the rest of the waste will be disposed of according to legislation.

8.2.4. Environmental Noise Measurement

Noise level in the environment near the hydropower electric facilities operated by the RES Branch was not measured in 2021, because the facilities are dislocated from the settlement.

8.3. Working Environment Monitoring, Occupational Health and Safety

Occupational Safety and Health Protection Reports in 2021 include the following elements:

- **Working Environment Monitoring**
 - noise measurements in the working environment

- **Occupational Safety**
 - Training of employees
 - Occupational injuries
- **Health protection**

8.3.1 Working Environment Monitoring

- **Noise measurements in the working environment**

No noise measurement were made in the working environment in 2021.

8.3.2. Occupational Safety

- **Training of employees**

Employee training, which was done, is training employees for safe and healthy work, and is done according to the Training Program, theoretically and practically.

- Training of employees for safe and healthy work - 37 employees.

- **Occupational injuries**

In table 125 are given data on number of occupational injuries in 2021.

Table 125

RENEWABLE ENERGY SOURCES BRANCH						
Occupational injuries in 2021						
Organizational unit	Number of employees	Injuries in relation to the number of employees				
		Light	Severe	Fatal	Total	%
Renewable Energy Sources	57	0	1	0	1	1,75
TOTAL: RENEWABLE ENERGY SOURCES BRANCH	57	0	1	0	1	1,75

8.3.3. Health Protection

In table 126 are given data on number of occupational injuries.

Table 126

RENEWABLE ENERGY SOURCES BRANCH											
Work ability of employees in 2021											
Branch	Number of employees	Periodical examination				Work capability					
		For medical examination		Examined		Capable		Limited capability		Not capable	
		No.	%	No.	%	No.	%	No.	%	No.	%
Branch management	11	0	0,00	0	0,00	0	0,00	0	0,00	0	0,00
Istok SHPP	32	27	84,38	27	100,00	27	100,00	0	0,00	0	0,00
Zapad SHPP	14	10	71,43	10	100,00	10	100,00	0	0,00	0	0,00
TOTAL: RENEWABLE ENERGY SOURCES BRANCH	57	37	64,91	37	100,00	37	100,00	0	0,00	0	0,00

8.4. Public Submissions

There was no public complaints regarding environment in 2021.

9. PE EPS HQ

9.1. Working Environment Monitoring, Occupational Health and Safety

The 2021 Occupational Safety and Health Reports include the following elements:

- **Working environment monitoring**
 - Working environment noise measurements
- **Safety**
 - Employees training
 - Work injuries
- **Health**

9.1.1. Working Environment Monitoring

- **Working environment noise measurements**

At the measuring points at which measurements were made, the measured noise value does not exceed the limit values.

9.1.2. Occupational Safety

- **Employees training**

Occupational Health and Safety training of employees is carried out according to the Training Programme, theoretically and practically.

- Health and Safety training of employees – 67 employees.

- **Work injuries**

The number of work injuries that occurred in 2020 is presented in Table 127.

Table 127

PE EPS HQ						
Occupational injuries in 2021						
Organisational unit	Number of employees	Injuries in relation to the number of employees				
		Light	Severe	Fatal	Total	%
PE EPS HQ	934	4	0	0	4	0,43
TOTAL: PE EPS HQ	934	4	0	0	4	0,43

9.1.3. Health Protection

There are no employees in PE EPS HQ working in high-risk workplaces. Periodic medical examinations of employees are shown in Table 128.

Table 128

PE EPS HQ											
Work capability in 2021											
Organisational unit	Number of employees	Periodical examination				Work capability					
		For medical examination		Examined		Capable		Limited capability		Not capable	
		No.	%	No.	%	No.	%	No.	%	No.	%
PE EPS HQ	934	0	0,00	0	0,00	0	0,00	0	0,00	0	0,00
TOTAL: PE EPS HQ	934	0	0,00	0	0,00	0	0,00	0	0,00	0	0,00

9.2. Public Submissions

Public complaints for 2021 are shown in Table 129

Table 129

PE EPS HQ			
Public complaints in 2021			
Organisational unit	Complaint (No. And date) and submitted by	Topic of complaint	Taken actions
Service for Internal Regulation and Relations with Regulatory Bodies and Stakeholders	e-mail (12.01.65360/1-21) 01.02.2021. Natural person	Request for information on: implemented projects in terms of environmental improvement in the period from 2017 to 2020., future projects whose implementation is planned in the next 3 or 5 years	The applicant was provided with a tabular overview of projects and the degree of their implementation (12.01.65360/2-21, dated on March 10, 2021)

10. EPS SNABDEVANJE BRANCH

10.1. Working Environment Monitoring, Occupational Health and Safety

The 2021 Occupational Safety and Health Reports include the following elements:

- **Working environment monitoring**
 - Working environment noise measurements
- **Safety**
 - Employees training
 - Work injuries
- **Health**

10.1.1. Working Environment Monitoring

- **Working environment noise measurements**

In 2021 Working environment noise measurements were not performed.

10.1.2. Occupational Safety

- **Employees training**

Specific Occupational Health and Safety training of employees is carried out according to the Training Program, theoretically and practically. The following trainings were carried out in 2021:

- Health and Safety training of employees.....59

Informing the employees about the dangers and hazards, i.e. risk factors, is performed in compliance with Rulebook on Occupational Health and Safety as well as with Risk Assessment Act*.

*Note: The act on risk assessment for EPS SNABDEVANJE BRANCH, was adopted on November 15, 2021. Training for safety and health at work of employees began at the end of 2021 and will continue during 2022.

- **Work injuries**

The number of work injuries that occurred in 2021 is presented in Table 130.

Table 130

EPS SNABDEVANJE BRANCH						
Occupational injuries in 2021						
Organizational unit	Number of employees	Injuries in relation to the number of employees				
		Light	Severe	Fatal	Total	%
TOTAL:	1.141	1	5	0	6	0,53

10.1.3. Health Protection

In EPS Snabdevanje there are no employees working on high-risk posts. Periodic medical examinations of employees are shown in Table 131.

Table 131

EPS SNABDEVANJE BRANCH											
Working capacity in 2021											
Organisational unit	Number of employees	Periodical examination				Work capability					
		For medical examination		Examined		Capable		Limited capability		Not capable	
		No.	%	No.	%	No.	%	No.	%	No.	%
EPS SNABDEVANJE	1.141	0	0,00	0	0,00	0	0,00	0	0,00	0	0,00
TOTAL: EPS SNABDEVANJE BRANCH	1.141	0	0,00	0	0,00	0	0,00	0	0,00	0	0,00

10.2. Public Submissions

There was no public submissions regarding environment in 2021.

ANNEX 1. MODEL REPORT ON ENVIRONMENTAL PROTECTION OF THE EUROPEAN BANK FOR RECONSTRUCTION AND DEVELOPMENT

Coal production, processing and transport plants.

For each mining company::

- Summarize the status of permits, licenses and other necessary approvals for each capital plant (such as coal mines). Indicate each case of non-compliance with applicable national environmental, health and safety requirements.
- Identify any new permit required during the reported year or a permit that will expire in less than a year and request a renewal accordingly.

Please provide data for the following parameters for each plant.

- Emissions (key emissions, MDK, current emissions)
- Solid waste (type and amount of waste)
- Water use (amount of water used, permitted values)
- Wastewater (key wastewater, MDK, current wastewater quantities)
- Noise
- Summarize the health and safety report, including the accident rate and each initiative implemented and planned during the period, including the training program report
- Summarize public complaints, if any, related to the project and take steps to respond to them.

Electricity production plant

For each power plant provide:

- Summarize the status of permits, licenses and other necessary approvals for each power plant. Indicate each case of non-compliance with applicable national environmental, health and safety requirements.
- Identify any new permit that will expire in less than a year and request a renewal accordingly.

Please provide data for the following parameters for each power plant:

Emissions

	Current emission	Limit values
Particle content		
CO ₂		
NO _x (NO ₂)		

Identified negative impacts on the flow and ecological system below the reservoir

- Solid waste (type and amount of waste)
- Water use (amount of water used, permitted values)
- Wastewater (key wastewater, MDK, current wastewater quantities)
- Noise
- Summarize the health and safety report, including the accident rate and each initiative implemented and planned during the period, including the training program report
- Summarize public complaints, if any, related to the project and take steps to respond to them.

ANNEX 2. LEGISLATION OF THE REPUBLIC OF SERBIA ON ENVIRONMENTAL PROTECTION

Constitution of the Republic of Serbia ("Official Gazette of RS", No. 98/2006)

LAWS

1. Law on Environmental Protection "Official Gazette of RS", No. 135/2004, 36/2009, 36/2009-other law, 72/2009 - other law, 43/2011 - US decision, 14/2016, 76/2018, 95/2018 - other law and 95/2018 - other law)
2. Law on Nature Protection ("Official Gazette of RS", No. 36/2009, 88/2010, 91/2010 - amended, 14/2016 and 95/2018 - other law and 71 / 2021-3)
3. Law on Environmental Impact Assessment ("Official Gazette of RS", No. 135/04 and 36/2009)
4. Law on Strategic Environmental Assessment ("Official Gazette of RS", No. 135/2004 and 88/2010)
5. Law on Integrated Prevention and Control of Environmental Pollution ("Official Gazette of RS", No. 135/2004 and 25/2015 and 109/2021)
6. Law on Air Protection ("Official Gazette of RS", No. 36/2009 and 10/2013 and 26/2021)
7. Law on Environmental Noise Protection ("Official Gazette of RS", No. 96/2021)
8. Law on Protection against Non-Ionizing Radiation ("Official Gazette of RS", No. 36/2009)
9. Law on Land Protection ("Official Gazette of RS", No. 112/2015)
10. Law on Packaging and Packaging Waste ("Official Gazette of RS", No. 36/2009 and 95/2018 - other law)
11. Law on Biocidal Products ("Official Gazette of RS", No. 109/2021)
12. Law on Chemicals ("Official Gazette of RS", No. 36/2009, 88/2010, 92/2011 and 93/2012 and 25/2015)
13. Law on Waste Management ("Official Gazette of RS", No. 36/2009, 88/2010, 14/2016 and 95/2018 - other law)
14. Law on Waters ("Official Gazette of RS", No. 30/2010, 93/2012, 101/2016, 95/2018 and 95/2018 - other law)
15. Law on Meteorological and Hydrological Activities ("Official Gazette of RS", No. 88/2010)
16. Law on Protection and Sustainable Use of Fish Stock ("Official Gazette of RS", No. 128/2014 and 95/2018 - other law)
17. Law on Mining and Geological Research ("Official Gazette of RS", No. 101/2015 and 95/2018 - other law 40/2021)
18. Law on Planning and Construction "Official Gazette of RS", No. 72/2009, 81/2009 - corrigendum, 64/2010 - US decision, 24/2011, 121/2012, 42/2013 - US decision, 50 / 2013 - US decision, 98/2013 - US decision, 132/2014, 145/2014, 83/2018, 31/2019, 37/2019 - other law and 9/2020 and 52/2021)
19. Law on Agricultural Land ("Official Gazette of RS", No. 62/2006, 65/2008 - other law, 41/2009, 112/2015, 80/2017 and 95/2018 - other law)
20. Law on Forests ("Official Gazette of RS", No. 30/2010, 93/2012, 89/2015 and 95/2018 - other law)
21. Law on Ratification of the Convention on Access to Information, Public Participation in Decision-Making and the Right to Legal Protection in Environmental Matters ("Official Gazette of RS - International Agreements", No. 38/2009)
22. Law on Ratification of the Protocol on Pollutant Release and Transfer Registers to the Convention on Access to Information, Public Participation in Decision-Making and the Right to Legal Protection in Environmental Matters ("Official Gazette of RS - International Agreements", No. 8/2011)
23. Law on Safety and Health at Work ("Official Gazette of RS", No. 101/2005, 91/2015 and 113/2017 - other law)
24. Law on Fees for the Use of Public Goods ("Official Gazette of RS", No. 95/2018, 49/2019, 86/2019 - harmonized din. Amounts 86/2019, 156/2020 and 15/2021 - Amendment)

DECREES

1. Decree on determining the List of projects for which an impact assessment is required and the List of projects for which an environmental impact assessment may be required ("Official Gazette of RS", No. 114/2008)
2. Decree on noise indicators, limit values, methods for assessment of noise indicators, harassment and harmful effects of noise in the environment ("Official Gazette of RS", No. 75/2010)
3. Decree on conditions for monitoring and air quality requirements ("Official Gazette of RS", No. 11/2010, 75/2010 and 63/2013)
4. Decree on limit values of emissions of pollutants into the air from combustion plants ("Official Gazette of RS", No. 6/2016 and 67/2021)
5. Decree on limit values of emissions of pollutants into the air from stationary sources of pollution, except for combustion plants ("Official Gazette of RS", No. 111/2015 and 83/2021)
6. Decree on measurements of emissions of pollutants into the air from stationary sources of pollution ("Official Gazette of RS", No. 5/2016)
7. Decree on the methodology for the preparation of the inventory of emissions and projections of air pollutants ("Official Gazette of RS", No. 3/2016)
8. Decree on the methodology of data collection for the National Inventory of Unintentionally Released Long-Term Organic Pollutants (Official Gazette of RS, No. 76/2010)
9. Decree on the methodology of data collection for the national inventory of greenhouse gas emissions ("Official Gazette of RS", No. 81/2010)
10. Decree on the treatment of ozone-depleting substances, as well as on the conditions for issuing permits for import and export of these substances ("Official Gazette of RS", No. 114/2013, 23/2018, 44/2018 - other law, 95 / 2018 - other law)
11. Decree on Determining the Air Quality Control Program in the State Network ("Official Gazette of RS", No. 58/2011)
12. Decree on the designation of zones and agglomerations ("Official Gazette of RS", No. 58/2011 and 98/2012)
13. Decree on determining the List of air quality categories by zones and agglomerations on the territory of the Republic of Serbia for 2018 ("Official Gazette of RS", No. 88/2020)
14. Decree on determining the air quality control program in the state network ("Official Gazette of RS", No. 58/2011)
15. Decree on types of waste for which thermal treatment is performed, conditions and criteria for determining the location, technical and technological conditions for design, construction, equipment and operation of thermal waste treatment plants, treatment of residue after incineration ("Official Gazette of RS"). No. 102/2010 and 50/2012)
16. Decree on waste disposal in landfills ("Official Gazette of RS", No. 92/2010)
17. Decree on the List of non-hazardous waste for which no permit is issued with documentation accompanying cross-border movements ("Official Gazette of RS", No. 102/2010 and 36/2021)
18. Decree on the designation of certain types of hazardous waste that can be imported as secondary raw materials ("Official Gazette of RS", No. 60/2009)
19. Decree on limit values of priority and priority hazardous substances polluting surface waters and deadlines for their achievement ("Official Gazette of RS", No. 24/2014)
20. Decree on Water Classification ("Official Gazette of the SRS", No. 5/1968)
21. Decree on the categorization of watercourses ("Official Gazette of the SRS", No. 5/1968)
22. Decree on types of activities and facilities for which an integrated permit is issued ("Official Gazette of RS", No. 84/2005)
23. Decree on the content of the program of measures to adjust the operation of the existing plant or activities to the prescribed conditions ("Official Gazette of RS", No. 84/2005)
24. Decree on Criteria for Determining the Best Available Techniques, for Applying Quality Standards, as well as for Determining Emission Limits in the Integrated Permit ("Official Gazette of RS", No. 84/2005)

25. Decree on Determining the Program of Dynamics of Submission of Applications for Issuance of Integrated Permit ("Official Gazette of RS", No. 108/2008)
26. Decree on Limit Values of Pollutants, Harmful and Dangerous Substances in Soil ("Official Gazette of RS", No. 30/2018 and 64/2019)
27. Decree on systematic monitoring of the condition and quality of land ("Official Gazette of RS", No. 88/2020)
28. Decree on determining the criteria for determining the status of endangered environment and priorities for remediation and remediation ("Official Gazette of RS", No. 22/2010)
29. Decree on waste lists for transboundary movements, content and appearance of documents accompanying transboundary movements of waste with instructions for their completion ("Official Gazette of RS", No. 60/2009 and 36/2021)
30. Decree on Determining Activities whose Performance Affects the Environment ("Official Gazette of RS", No. 109/2009 and 8/2010)
31. Decree on Determining the List of Projects for Which Impact Assessment is Mandatory and the List of Projects for Which Environmental Impact Assessment May Be Required ("Official Gazette of RS", No. 114/2008)
32. Decree on the amount and conditions for the allocation of incentive funds "Official Gazette of RS" No. 88/2009, 67/2010, 101/2010, 86/2011, 35/2012. See: Rulebook on harmonized amounts of incentive funds - 48 / 2012, 41/2013 and 81/2014, 30/2015, 44/2016, 43/2017, 45/2018, 20/2019, 49/2019, 51/2020)
33. Decree on products that after use become special waste streams, form of daily records on the quantity and type of produced and imported products and annual report, manner and deadlines for submission of annual report, payers, criteria for calculation, amount and manner of calculation and payment of fees ("Official Gazette of RS", No. 54/2010, 86/2011, 15/2012, 3/2014, 31/2015 - other regulations, 44/2016 - other regulations, 43/2017 - other regulations, 45 / 2018 - other regulations, 67/2018 - other regulations, 95/2018 - other regulations and 77/2021)
34. Decree on the termination of the Decree on the manner and procedures of asbestos-containing waste management ("Official Gazette of RS" No. 74/2010)
35. Decree on the list of industrial plants and activities in which the emission of volatile organic compounds is controlled, on the values of emission of volatile organic compounds at a certain solvent consumption and total allowable emissions, as well as emission reduction schemes ("Official Gazette of RS", No. 100/2011)
36. Decree on conditions for monitoring and air quality requirements ("Official Gazette of RS", No. 11/2010, 75/2010 and 63/2013)
37. Decree on Criteria and Manner of Approval of Programs and Projects Implemented under the Clean Development Mechanism ("Official Gazette of RS", No. 44/2010)
38. Decree on limit values for emissions of pollutants into water and deadlines for their achievement ("Official Gazette of RS", No. 67/2011, 48/2012 and 1/2016)
39. Decree on limit values of pollutants in surface and groundwater and sediment and deadlines for their achievement ("Official Gazette of RS", No. 50/2012)
40. Decree on the content and manner of managing the environmental information system, methodology, structures, common ground, categories and levels of data collection as well as the content of information about which the public is regularly and obligatorily informed ("Official Gazette of RS", No. 112/2009)
41. Decree on the termination of the Decree on waste management ("Official Gazette of RS", No. 71/2010)
42. Decree on closer conditions that must be met by users of funds, conditions and manner of distribution of funds, criteria and criteria for assessing requests for distribution of funds, manner of monitoring the use of funds and contractual rights and obligations, as well as other issues relevant for allocation and use of funds Green Fund ("Official Gazette of RS", No. 25/2018)
43. Decree on the treatment of fluorinated gases with a greenhouse effect as well as the conditions for issuing permits for import and export of these gases ("Official Gazette of RS", No. 120/2013, 44/2018 - other regulation)

44. Decree on the methodology for the preparation of the inventory of emissions and projections of air pollutants ("Official Gazette of RS", No. 3/2016)
45. Decree on determining the Packaging Waste Reduction Plan for the period from 2020 to 2024 ("Official Gazette of RS", No. 81/2020)
46. Decree on the amount of fees, taxpayers, as well as the method of payment of fees for the assessment and verification of data on biocidal products ("Official Gazette of RS", No. 90/2015)
47. Decree on Determining the Annual Water Status Monitoring Program for 2020 ("Official Gazette of RS", No. 85/2020)
48. Decree on control of the use and trade of wild flora and fauna ("Official Gazette of RS", No. 31/2005, 45/2005 - correction, 22/2007, 38/2008, 9/2010, 69/2011, 95 / 2018 - other regulations)

RULEBOOK

1. Rulebook on emission limit values, manner and deadlines for measurement and recording of data ("Official Gazette of RS", No. 30/1997 and 35/1997 - correction)
2. Rulebook on the content, appearance and manner of keeping the public book on implemented procedures and adopted decisions on environmental impact assessment ("Official Gazette of RS", No. 69/2005)
3. Rulebook on the procedure of public insight, presentation and public debate on the study on environmental impact assessment ("Official Gazette of RS", No. 69/2005)
4. Rulebook on the work of the technical commission for the evaluation of the study on environmental impact assessment ("Official Gazette of RS", No. 69/2005)
5. Rulebook on the content of the request on the need for impact assessment and the content of the request for determining the scope and content of the study on environmental impact assessment ("Official Gazette of RS", No. 69/2005)
6. Rulebook on the content of the study on environmental impact assessment ("Official Gazette of RS", No. 69/2005)
7. Rulebook on the content of the project of protection and rehabilitation of the environment during and after the use of natural resources, procedure and conditions of giving consent to the project ("Official Gazette of RS", 35/2019)
8. Rulebook on noise measurement methods, content and scope of the noise measurement report ("Official Gazette of RS", No. 72/2010)
9. Rulebook on the conditions that must be met by a professional organization for noise measurement, as well as on the documentation submitted with the request for obtaining an authorization for noise measurement ("Official Gazette of RS", No. 72/2010)
10. Rulebook on the methodology for determining acoustic zones ("Official Gazette of RS", No. 72/2010)
11. Rulebook on the content and methods of making strategic noise maps and the manner of their presentation to the public ("Official Gazette of RS", No. 80/2010)
12. Rulebook on the methodology for drafting action plans ("Official Gazette of RS", No. 72/2010)
13. Rulebook on the manner of exchange of information on metering points in the state and local network, measurement techniques, as well as the manner of exchange of data obtained by monitoring air quality in state and local networks ("Official Gazette of RS", No. 84/2010)
14. Rulebook on the content of air quality plans ("Official Gazette of RS", No. 21/2010)
15. Rulebook on the content of short-term action plans ("Official Gazette of RS", No. 65/2010)
16. Rulebook on categories, testing and classification of waste ("Official Gazette of RS", No. 56/2010, 93/2019 and 39/2021)
17. Rulebook on the application form for issuing a permit for treatment, ie storage, reuse and disposal of waste ("Official Gazette of RS", No. 38/18)
18. Rulebook on the content and appearance of the waste management permit ("Official Gazette of RS", No. 93/2019)
19. Rulebook on the content, manner of keeping and appearance of the Register of issued waste management permits ("Official Gazette of RS", No. 95/2010)

20. Rulebook on the content of the certificate on exemption from the obligation to obtain a permit for storage of inert non-hazardous waste ("Official Gazette of RS", No. 73/2010)
21. Rulebook on the form of daily records and annual report on waste with instructions for its completion ("Official Gazette of RS", No. 7/2020 and 79/2021)
22. Rulebook on the manner of storage, packaging and marking of hazardous waste ("Official Gazette of RS", No. 92/2010 and 77/2021)
23. Rulebook on conditions, manner and procedure of waste oil management ("Official Gazette of RS", No. 71/2010)
24. Rulebook on the manner and procedure of managing spent batteries and accumulators ("Official Gazette of RS", No. 86/2010)
25. Rulebook on the manner and procedure of waste tire management ("Official Gazette of RS", No. 104/2009 and 81/2010)
26. Rulebook on the manner and procedure of waste vehicle management ("Official Gazette of RS", No. 98/2010)
27. Ordinance on the manner and procedure for the management of waste fluorescent tubes containing mercury ("Official Gazette of RS", No. 97/2010)
28. Rulebook on the treatment of waste containing asbestos ("Official Gazette of RS", No. 75/2010)
29. Rulebook on conditions and manner of collection, transport, storage and treatment of waste used as a secondary raw material or for energy production ("Official Gazette of RS", No. 98/2010)
30. Rulebook on the methodology for collecting data on the composition and quantities of municipal waste on the territory of the local self-government unit ("Official Gazette of RS", No. 14/2020)
31. Rulebook on treatment of devices and waste containing PCBs ("Official Gazette of RS", No. 37/2011)
32. Instruction on determining preventive measures for safe storage, storage, i.e. use of especially dangerous chemicals ("Official Gazette of RS", No. 6/2017)
33. Rulebook on import and export of certain hazardous chemicals ("Official Gazette of RS", No. 89/2010, 15/2013 and 114/2014)
34. Rulebook on the content of the safety data sheet ("Official Gazette of RS", No. 100/2011)
35. Rulebook on the Register of Chemicals ("Official Gazette of RS", No. 16/2016, 6/2017, 117/2017, 44/2018 - other law, 7/2019, 93/2019, 6/2021 and 126/2021)
36. Rulebook on Restrictions and Prohibitions on Production, Marketing and Use of Chemicals ("Official Gazette of RS", No. 90/2013, 25/2015, 2/2016 and 44/2017, 36/2018, 9/2020)
37. Rulebook on criteria for identification of a substance as PBT or VPVB ("Official Gazette of RS", No. 23/2010)
38. Rulebook on licenses for trade activities, ie licenses for the use of particularly dangerous chemicals ("Official Gazette of RS", No. 6/2017, 29/2018)
39. Rulebook on detergents ("Official Gazette of RS", No. 25/2015)
40. List of surfactants for which approval has been issued or an act approving the use of surfactants in detergent in the EU and List of surfactants for which the application for approval has been rejected and surfactants banned in the EU (Official Gazette of RS, No. 94/2010)
41. Rulebook on the manner of keeping records on chemicals ("Official Gazette of RS", No. 31/2011)
42. Rulebook on classification, packaging, labeling and advertising of chemicals and certain products ("Official Gazette of RS", No. 59/2010, 25/2011 and 5/2012)
43. Rulebook on classification, packaging, labeling and advertising of chemicals and certain products in accordance with the Globally Harmonized System for Classification and Labeling of the UN ("Official Gazette of RS", No. 105/2013, 52/2017, 21/2019)
44. Rulebook on detailed conditions for keeping hazardous chemicals in the sales area and the manner of marking that area ("Official Gazette of RS", No. 31/2011 and 16/2012)
45. Rulebook on the content and form of requests for issuing water acts and the content of opinions in the procedure of issuing water conditions and the content of reports in the

- procedure of issuing water permits ("Official Gazette of RS", No. 72/2017, 44/2018 - other regulations and 12 / 2022)
46. Rulebook on the content and manner of keeping the cadastre of water information system, methodology, structure, categories and levels of data collection, as well as on the content of data communicated to the public ("Official Gazette of RS", No. 54/2011)
 47. Rulebook on the content and manner of keeping the cadastre of water bodies ("Official Gazette of RS", No. 34/2011)
 48. Rulebook on the content and manner of keeping the register of issued integrated permits ("Official Gazette of RS", No. 69/2005)
 49. Rulebook on the content, appearance and manner of filling in the application for the issuance of an integrated permit ("Official Gazette of RS", No. 30/2006, 32/2016 and 44/2018 - other regulations)
 50. Rulebook on the content and appearance of the integrated permit ("Official Gazette of RS", No. 30/2006)
 51. Rulebook on the methodology for the preparation of the national and local register of pollution sources, as well as the methodology for the types, methods and deadlines of data collection ("Official Gazette of RS", No. 91/2010, 10/2013 and 98/2016)
 52. Rulebook on exposure limits to non-ionizing radiation and measurements to assess the level of exposure to ionizing radiation ("Official Gazette of RS", No. 86/2011, 50/2018)
 53. Rulebook on sources of non-ionizing radiation of special interest, types of sources, manner and period of their examination ("Official Gazette of RS", No. 104/2009)
 54. Rulebook on the content of records on sources of non-ionizing radiation of special interest ("Official Gazette of RS", No. 104/2009)
 55. Rulebook on the content and appearance of the form of the report on systematic inspection of the level of non-ionizing radiation in the environment ("Official Gazette of RS", No. 104/2009)
 56. Rulebook on the conditions that must be met by legal entities that perform activities of testing the radiation levels of non-ionizing radiation sources of special interest in the environment ("Official Gazette of RS", No. 104/2009)
 57. Rulebook on conditions that must be met by legal entities that perform systematic testing of non-ionizing radiation levels, as well as the manner and methods of systematic testing in the environment ("Official Gazette of RS", No. 104/2009)
 58. Rulebook on the methodology for the preparation of rehabilitation and remediation projects ("Official Gazette of RS", No. 74/2015)

STRATEGIES

1. National Strategy for Approximation in the Field of Environmental Protection for the Republic of Serbia ("Official Gazette of RS", No. 80/2011)
2. Strategy for the introduction of cleaner production in the Republic of Serbia ("Official Gazette of RS", No. 17/2009)
3. Strategy for the implementation of the Convention on Access to Information, Public Participation in Decision-Making and the Right to Legal Protection in Environmental Matters - Aarhus Convention ("Official Gazette of RS", No. 103/2011)
4. National Strategy for Sustainable Development ("Official Gazette of RS", No. 57/2008)
5. Strategy of Mineral Resources Management of the Republic of Serbia until 2030 ("Official Gazette of RS", No. 09/2010)
6. Energy Development Strategy of the Republic of Serbia until 2025 with a projection until 2030 ("Official Gazette of RS", No. 101/2015)

DECISIONS

1. Decision on the preparation of the Strategic Environmental Assessment of the Spatial Plan of the Special Purpose Area of the Regional Kolubara Water Supply System on the Environment ("Official Gazette of RS", No. 7/2020 and 65/2020)

2. Decision on non-accession to the preparation of the Strategic Environmental Assessment for the Nature Protection Program of the Republic of Serbia for the period from 2020 to 2022 ("Official Gazette of RS", No. 93/2019)
3. Decision on the preparation of the Strategic Environmental Assessment of the Regional Waste Management Plan for 11 cities and municipalities of the Kolubara region for the period from 2019 to 2029 ("Official Gazette of RS", No. 81/2019)
4. Decision on the preparation of the Strategic Impact Assessment Amendments to the Spatial Plan of the Kolubara Lignite Basin Exploitation Area ("Official Gazette of RS", No. 48/2019)
5. Decision on preparation of the Strategic Impact Assessment of the Spatial Plan of the Special Purpose Area for the construction of the Thermal Power Plant "Kolubara B" ("Official Gazette of RS", No. 46/2019)
6. Decision on the preparation of the Strategic Assessment of the Environmental Impact of the Spatial Plan of the Republic of Serbia from 2021 to 2035 ("Official Gazette of the RS", No. 41/2019)
7. Decision on the preparation of the Strategic Impact Assessment of the Waste Management Program ("Official Gazette of RS", No. 30/2019)
8. Decision on the preparation of the Strategic Environmental Assessment of the Low Carbon Development Strategy with an action plan ("Official Gazette of RS", No. 62/2018, 26/2019)
9. Decision on the preparation of the Strategic Impact Assessment of the National Emission Reduction Plan (NERP) ("Official Gazette of RS", No. 57/2018)
10. Decision on the preparation of the Strategic Assessment of the Environmental Impact of the Action Plan for the Implementation of the Water Management Strategy on the Territory of the Republic of Serbia until 2034 ("Official Gazette of RS", No. 56/2018)
11. Decision on preparation of the Strategic Assessment of the Environmental Impact of the Revised Regional Waste Management Plan for 11 cities and municipalities of the Kolubara region ("Official Gazette of RS", No. 46/2017)
12. Decision on the preparation of the Strategic Environmental Assessment of the Plan for the Protection of Waters from Pollution on the Environment ("Official Gazette of RS", No. 48/2016)
13. Decision on the preparation of the Strategic Assessment of the Impact of Amendments to the Spatial Plan of the Special Purpose Area of the Kostolac Coal Basin on the Environment ("Official Gazette of RS", No. 108/2015)
14. Decision on the preparation of the Strategic Environmental Assessment (Amendments to the Spatial Plan of the area of exploitation of the Kolubara lignite basin on the environment) ("Official Gazette of RS", No. 33/2015)
15. Decision on the preparation of the Strategic Assessment of the Impact of the Energy Development Strategy of the Republic of Serbia until 2025 with projections until 2030 on the environment ("Official Gazette of RS", No. 56/2016)
16. Decision on the preparation of the Strategic Environmental Assessment (Water Management Strategy on the territory of the Republic of Serbia) ("Official Gazette of RS", No. 30/2013)
17. Decision on preparation of the Strategic Environmental Assessment of the Regional Spatial Plan for the area of the Danube and Braničevo administrative districts on the environment ("Official Gazette of RS", No. 34/2010)

REGULATIONS FROM OTHER AREAS APPLICABLE IN THE AREA OF ENVIRONMENTAL PROTECTION

Ratified international agreements that are important for the Republic of Serbia

1. Law on Ratification of the Kyoto Protocol to the United Nations Framework Convention on Climate Change ("Official Gazette of RS - International Agreements", No. 88/2007, 38/2009 and 2/2017)
2. Law on Ratification of the Amendment to Annex B of the Kyoto Protocol to the United Nations Framework Convention on Climate Change ("Official Gazette of RS - International Agreements", No. 38/2009)

3. Law on Ratification of the Doha Amendment to the Kyoto Protocol to the United Nations Framework Convention on Climate Change ("Official Gazette of RS - International Agreements", No. 2/2017)
4. Law on Ratification of the Convention on Environmental Impact Assessment in a Transboundary Context ("Official Gazette of RS", No. 102/2007)
5. Law on Ratification of Amendments to the Convention on Environmental Impact Assessment in a Transboundary Context ("Official Gazette of RS - International Agreements", No. 4/2016)
6. Law on Ratification of the Stockholm Convention on Persistent Organic Pollutants ("Official Gazette of RS", No. 42/2009)
7. Law on Ratification of the Convention on Biological Diversity ("Official Gazette of the FRY - International Agreements", No. 11/2001)
8. Law on Ratification of the Convention on International Trade in Endangered Species of Wild Fauna and Flora ("Official Gazette of the FRY - International Agreements", No. 11/2001)
9. Law on Ratification of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal ("Official Gazette of the FRY - International Agreements", No. 2/1999)
10. Law on Ratification of the United Nations Framework Convention on Climate Change, with annexes ("Official Gazette of the FRY - International Agreements", No. 2/1997)
11. Law on Ratification of the Vienna Convention for the Protection of the Ozone Layer, with Annexes I and II ("Official Gazette of the SFRY - International Agreements", No. 1/1990)
12. Law on Ratification of the International Convention for the Protection of Birds ("Official Gazette of the SFRY", No. 6/73)
13. Decree on Ratification of the Convention on Wetlands of International Importance, Especially as a Residence for Wetland Birds ("Official Gazette of the SFRY - International Agreements", No. 9/77)
14. Law on Ratification of the European Convention for the Protection of Animals in International Transport and the Protocol as an Addendum to the Convention for the Protection of Animals in International Transport ("Official Gazette of the FRY - International Agreements", No. 1/92)
15. Law on Ratification of the Convention on Cooperation for the Protection and Sustainable Use of the Danube River ("Official Gazette of the FRY - International Agreements", No. 2/2003)
16. Law on Ratification of the Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer ("Official Gazette of Serbia and Montenegro - International Agreements", No. 24/2004)
17. Law on Ratification of the Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer ("Official Gazette of RS - International Agreements", No. 17/2021)
18. Decree on the Agreement on Fisheries on the Danube Waters between the Government of the FPRY, the People's Republic of Bulgaria, the Romanian People's Republic and the Union of Soviet Republics ("Official Gazette of the FPRY", No. 8/58)
19. Law on Ratification of the Convention Concerning the Protection of the World Cultural and Natural Heritage ("Official Gazette of the SFRY - International Agreements", No. 56/74)
20. Law on Ratification of the Convention for the Protection of Cultural Property in the Event of Armed Conflict ("Official Gazette of the FPRY - International Agreements", No. 4/56)
21. Law on Ratification of the Convention on Measures to Prohibit and Prevent Illicit Imports, export and transfer of ownership of cultural property ("Official Gazette of the SFRY-International Agreements", No. 50/73)
22. Law on Ratification of the Vienna Convention on Civil Liability for Nuclear Damage ("Official Gazette of the SFRY-International Agreements", No. 5/77)
23. Regulation on Ratification of the Convention Establishing the European Plant Protection Organization ("Official Gazette of the FPRY - International Agreements", No. 12/57)
24. Decree on Ratification of the International Plant Protection Convention ("Official Gazette of the FPRY - International Agreements", No. 7/55)
25. Law on Ratification of the Agreement on Protection of Waters of the Tisa River and its Tributaries from Pollution ("Official Gazette of the SFRY - International Agreements", No. 1/90)
26. Law on Ratification of the Convention on Long-range Transboundary Air Pollution ("Official Gazette of the SFRY - International Agreements", No. 11/86)

27. Law Ratifying the Protocol with the Convention on Long-range Trans-boundary Air Pollution on Long-term Financing of the Cooperative Program for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP) ("Official Journal of SFRY" - International Treaties, No. 2/87)
28. Law Ratifying The Montreal Protocol on Substances that Deplete the Ozone Layer ("Official Gazette of the SFRY - International Agreements", No. 16/90)
29. Law on Ratification of Amendments to the Convention on the Physical Protection of Nuclear Material ("Official Gazette of RS - International Agreements", No. 04/2016)
30. Law on Conventions based on the Versailles Peace Treaty of June 8, 1919. and on the basis of the relevant provisions of other peace treaties adopted at International Labor Conferences. held in Washington. Genoa and Geneva 1919-1926) ("Official Gazette of the Kingdom of Yugoslavia", No. 44 XVI / 30)
31. Decree on Ratification of the Convention for the Protection against the Dangers of Benzene Poisoning ("Official Gazette of the SFRY - International Agreements", No. 16/76)
32. Law on Ratification of the Convention on the Prevention and Control of Occupational Risks Caused by Carcinogenic Substances and Agents ("Official Gazette of the SFRY - International Agreements", No. 3/77)
33. Law on prohibition of experiments with nuclear weapons into the atmosphere, cosmos and under water ("Official Journal of SFRY" - International Treaties, No. 11/63)
34. Law Ratifying the Convention for prohibition of development, production and stockpiling of bacteriological (biological and toxic) weapons and their destruction ("Official Journal of SFRY" - International Treaties, No. 43/74)
35. Law Ratifying the Convention for protection of employees from professional risks in working environment caused by air pollution, noise and vibration ("Official Journal of SFRY" - International Treaties, No. 14/82)
36. Law Ratifying the Convention for occupational health, medical protection and working environment ("Official Journal of SFRY" - International Treaties, No. 7/87)
37. Law Ratifying the Convention International Labor Organization No. 162 on Safety in the Use of Asbestos "Official Journal SFRY" - International Treaties, No. 4/89)
38. Law Ratifying the European Convention for the Protection of the Archaeological Heritage ("Official Journal SFRY" - International Treaties, No. 9/90)
39. Law Ratifying the European Convention for the Protection of the Architectural Heritage ("Official Journal SFRY" - International Treaties, No. 4/91)
40. Law Ratifying the Agreement between the Federal Government of the Federal Republic of Yugoslavia and the Government of the Russian Federation on cooperation in the field of environment protection and improvement "Official Gazette SRJ" - International Treaties, No. 6/96)

APPENDIX 3. ABBREVIATIONS

BOD	Biological Oxygen Demand
LEV	Limit Emission Value
MPC	Maximum Permissible Concentration
MP	Measuring Point
FGD	Flue Gas Desulfurization
OCM	Open Cast Mine
MB	Mining Basin
PSHPP	Pumped Storage Hydro Power Plant
TPP	Thermal Power Plant
TPP– OCM	Thermal Power Plant – Open Cast Mine
TPP- HP	Thermal Power Plant – Heating Plant
TS	Transformer Substation
TPM	Total Particulate Matters
HPP	Hydro Power Plant
COD	Chemical Oxygen Demand
DA	Distribution Area
OU	Organisation Unit
CP	Cadastral Plot
MME	Ministry of Mining and Energy
PS	Powdery Substances
RV	Referential Value
IPH	Institute for Public Health
PPE	Personal Protective Equipment
MCTI	Ministry of Construction, Transport and Infrastructure
SKO	Srednje Kosačko Ostrvo
SMP	Supplement to the mining project
LV	Limit value
LVE	Limit value of emissions