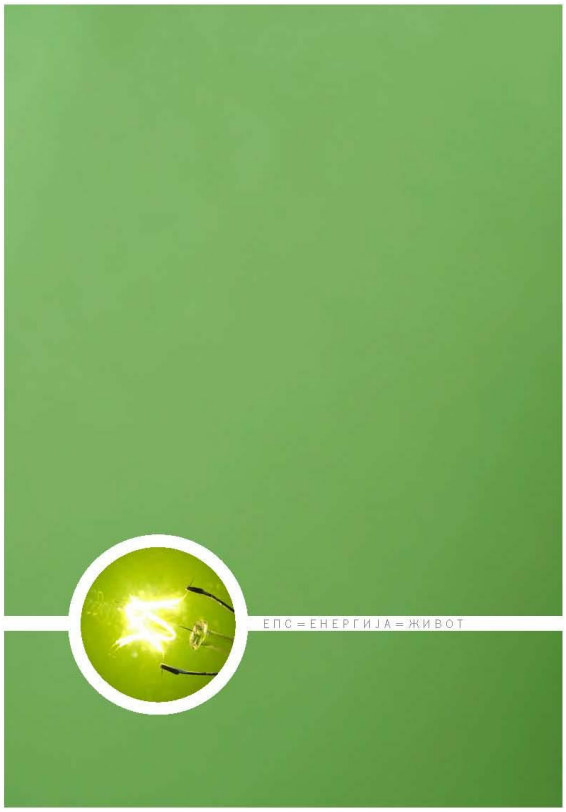
Electric Power Industry of Serbia

2022 Environmental Report



Belgrade, March 2023

INTRODUCTION

PE “Electric Power Industry of Serbia“ 2022 Environmental Report has been prepared on the basis of recommendations with respect to content and form – report template provided by the European Bank for Reconstruction and Development (APPENDIX 1) and on the basis of data on environmental state monitoring submitted by the responsible persons from PE EPS Organizational Units.

The data on the quantities of emitted substances affecting air quality is given on the basis of the calculation based on measured mass concentrations, i.e.emission flows and power units (boilers) operating hours in the year 2022.

APPENDIX 2 provides an overview of the legislation of the Republic of Serbia referring to environmental protection which was used as the basis for evaluation and comparison of the measured values of pollutants and other parameters with the allowed values.

Abbreviations used during Report preparation are given in APPENDIX 3.

I PUBLIC ENTERPRISE "ELECTRIC POWER INDUSTRY OF SERBIA"

Public Enterprise "Electric Power Industry of Serbia" Belgrade is a vertically organized company 100% owned by the state. The founder of PE EPS is the Republic of Serbia, and the Founder 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 predominant activity of the Public Enterprise "Electric Power Industry of Serbia" is energy related activity: electricity supply, activity code 35.14 – electricity trade.

The mission of the "Electric Power Industry of Serbia" is to provide secure electricity supply for consumers, according to market conditions, with continuous generation, increase in the quality of services and consumer satisfaction, improvement of environmental care and increase in general community wellfare.

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

Public Enterprise "EPS Trading" LLC Ljubljana was founded on July 1st 2014 as the first company founded abroad by PE EPS with the purpose of electricity trade.

PE EPS has founder rights in three public enterprises in Kosovo and Metohija. As of June 1999, PE EPS has not been able to manage its capacitites in K&M.

PE EPS Coal Production

In PE EPS, coal production is performed within PE EPS Organizational Units: Branch MB "Kolubara", Branch TPP-OPM "Kostolac" and PE OPM "Kosovo"**. The quanitites of raw and dry coal produced in year 2022 are given in Table 1 (except for PE OPM Kosovo**).

Table 1

PUBLIC ENTERPRISE "ELECTRIC POWER INDUSTRY OF SERBIA"							
COAL PRODUCTION IN YEAR 2022							
Organizational part		**Coal production (t)**			**Overburden production (m^3sm)**		
		Plan	**Achieved**	**%**	**Plan**	**Achieved**	**%**
Branch "MB KOLUBARA" – OPEN PIT MINES							
Field B		1.170.000	647.845	55,37	10.342.000	11.669.172	112,83
Field D		0	0	0,00	0	0	0,00
Field G		5.717.000	5.708.684	99,85	7.096.000	7.304.299	102,93
Tamnava – West Field		11.756.000	12.214.729	103,90	28.682.000	25.901.178	90,30
Radljevo		0	0	0,00	3.460.000	3.265.700	94,38
Field E		6.788.000	6.134.016	90,37	19.123.000	18.300.806	95,70
TOTAL(RAW COAL*): **BRANCH "MB KOLUBARA" – OPEN PIT MINES**		**25.431.000**	**24.705.274**	**97,15**	**68.703.000**	**66.441.155**	**96,71**
Kolubara Processing Plant (dry coal)	With dust	221.000	184.912	83,67			
	Without dust	206.000	177.028	85,94			
BRANCH "TPP-OPM KOSTOLAC" – OPEN PIT MINES							
Drmno		9.798.000	9.908.172	101,12	42.467.000	39.848.821	93,83
TOTAL: BRANCH "TPP-OPM KOSTOLAC" – OPEN PIT MINES		**9.798.000**	**9.908.172**	**101,12**	**42.467.000**	**39.848.821**	**93,83**
TOTAL: PE EPS OPEN PIT MINES		**35.229.000**	**34.613.446**	**98,25**	**111.170.000**	**106.289.976**	**95,61**

* Total quantity of raw coal from which one portion is used for producing dry coal
** As of June 1999, PE EPS has not been managing its capacitites in Kosovo and Metohija

Electricity Generation in PE EPS

Electricity generation in PE EPS is performed in thermal power facilities: TPP "Nikola Tesla", TPP-OPM "Kostolac", TPP-HP "Panonske", PE TPP "Kosovo"* and in hydro power plants: HPP "Đerdap" and HPP "Drinsko–Limske". Data on electricity generation (except for PE TPP "Kosovo"*) in year 2022 is given in Table 2.

Table 2

PUBLIC ENTERPRISE "ELECTRIC POWER INDUSTRY OF SERBIA"			
ELECTRICITY GENERATION IN YEAR 2022			
Branch	**Power Unit**	**Electricity generation (GWh)**	
		at the generator	**sent to grid**
TPP NIKOLA TESLA			
TPP NIKOLA TESLA A	A1 - A2	1.666,500	1.510,334
	A3 - A5	5.236,200	4.737,929
	A6	1.755,700	1.575,496
TPP NIKOLA TESLA B	B1 - B2	7.046,800	6.584,188
TPP KOLUBARA A	A1 - A4	137,900	130,222
	A5	200,000	179,065
TPP MORAVA	A	616,500	559,466
TOTAL: TPP NIKOLA TESLA		**16.659,400**	**15.276,700**
TPP-OPM "KOSTOLAC"			
TPP KOSTOLAC A	A1	668,900	594,766
	A2	1.247,7	1.153,582
TPP KOSTOLAC B	B1	2.460,400	2.209,771
	B2	2.423,300	2.178,382
TOTAL: TPP-OPM "KOSTOLAC"		**6.800,200**	**6.136,502**
TPP-HP PANONSKE			
TPP-HP NOVI SAD		745,800	685,854
TPP-HP ZRENJANIN		71,300	67,544
TPP-HP SREMSKA MITROVICA		0	0
TOTAL: TPP PANONSKE		**817,200**	**753,398**
TOTAL: TPP AND TPP-HP		**24.276,900**	**22.166,600**
HYDRO POWER PLANTS			
HPP ĐERDAP		6.011,200	5.978,780
HPP DRINSKO-LIMSKE		2.994,600	2.973,613
SMALL HPPs		11,119	11,119
TOTAL: HYDRO POWER PLANTS		**9.016,900**	**8.963,512**
PE ELEKTROKOSMET*			
TOTAL: PE EPS (without K&M)		**33.293,800**	**31.130,113**

*As of June 1999, PE EPS has not been managing its capacitites in Kosovo and Metohija

Fuel consumption in thermal power plants of PE EPS

Data on the consumption of solid, liquid and gaseous fuel in TPPs and TPP-HPs of PE EPS in year 2022 is given in Table 3.

Table 3

PUBLIC ENTERPRISE "ELECTRIC POWER INDUSTRY OF SERBIA"						
FUEL CONSUMPTION IN YEAR 2022						
Organizational part	Power unit /boiler	Fuel				
		Coal	Fuel oil	Oil	Gas	Biomass
		t	t	t	Stm^3	t
BRANCH "TPP NIKOLA TESLA"						
TPP "NIKOLA TESLA A"	A1	944.739	8.381	-	-	-
	A2	1.795.187	7.792	-	-	-
	A3	2.850.187	8.951	-	-	-
	A4	3.078.664	7.047	-	-	-
	A5	2.625.542	8.310	-	-	-
	A6	2.862.504	8.140	-	-	-
TPP "NIKOLA TESLA B"	B1	5.716.847	18.689	-	-	-
	B2	5.183.458	28.795	-	-	-
TPP "KOLUBARA A"	K1	189.124	-	2.065	-	-
	K2	-	-	-	-	-
	K3	51.909	-	911	-	-
	K4	58.896	-	477	-	-
	K5	52.340	-	632	-	-
	K6	467.766	-	3.909	-	-
TPP "MORAVA"	A1	850.864	2.893	336	-	-
TOTAL: BRANCH "TPP NIKOLA TESLA"		**26.728.027**	**98.998**	**8.330**	**-**	**-**
BRANCH "TPP-OPM KOSTOLAC"						
TPP "KOSTOLAC A"	A1	1.008.351	-	2.586	-	-
	A2	1.666.687	-	1.843	-	-
TPP "KOSTOLAC B"	B1	2.947.882	2.473		-	-
	B2	2.886.835	2.181		-	-
TOTAL: BRANCH "TPP-OPM KOSTOLAC"		**8.509.755**	**4.654**	**4.429**	**-**	**-**
BRANCH "MB KOLUBARA" – OU PRERADA PLANT						
HEATING PLANT VREOCI	K1 and K2	191.519	433,50	-	-	-
TOTAL: BRANCH "MB KOLUBARA"		**191.519**	**433,50**	**-**	**-**	**-**
BRANCH "TPP-HP PANONSKE"						
TPP-HP "NOVI SAD"	A1 (K1 and K2)	-	-	-	-	-
	A2 (K3)	-	-	-	-	-
	Chimney, both power units – continuous measuring	-	-	-	251.378,701	-
TPP-HP "ZRENJANIN"	A1	-	-	-	27.443,503	-
	A2	-	-	-	174,764	-
TPP-HP "SREMSKA MITROVICA"	A3 (K3 и K4)	-	-	-	-	-
	S24001-3	-	-	-	452,913	-
	Biomass boiler	-	-	-	89,498	5.593
TOTAL: BRANCH "TPP-HP PANONSKE"		**-**	**-**	**-**	**279.539,379**	**5.593**
TOTAL: PUBLIC ENTERPRISE "ELECTRIC POWER INDUSTRY OF SERBIA"		**35.429.301**	**104.085,50**	**12.759**	**279.539,379**	**5.593**

Emission of substances from thermal power plants that affect air quality

Data on the total emission of substances from thermal power plants that affect air quality in year 2022 for Organizational Units of PE EPS (except for PE TPP Kosovo*) is given in Table4.

Table 4

PUBLIC ENTERPRISE "ELECTRIC POWER INDUSTRY OF SERBIA"				
QUANTITY OF SUBSTANCES EMITTED FROM THERMAL POWER PLANTS THAT AFFECT AIR QUALITY IN 2022				
Organizational Part	t / year			
	Powdery substances	SO_2	NO_x(NO_2)	CO_2
BRANCH "TPP NIKOLA TESLA"	**4.863,36**	**224.530,12**	**24.724,63**	**18.794.175,86**
BRANCH "TPP-OPM KOSTOLAC"	**1.261,53**	**78.251,84**	**7.620,19**	**7.103.610,69**
BRANCH "TPP-HP PANONSKE"	**4,55**	**4,21**	**1.602,54**	**473.909,63**
BRANCH "MB KOLUBARA" - OU PROCESSING PLANT	**215,24**	**2.828,56**	**143,41**	**152.936,69**
TOTAL: PUBLIC ENTERPRISE "ELECTRIC POWER INDUSTRY OF SERBIA"	**6.344,68**	**305.614,73**	**34.090,77**	**26.524.632,87**

Injuries at work in PE EPS

Data on the number of injuries of employees at work in year 2022 for Organizational units of PE EPS is given in Table 5.

Table 5

PUBLIC ENTERPRISE "ELECTRIC POWER INDUSTRY OF SERBIA"						
INJURIES AT WORK IN YEAR 2022						
Organizational part	Number of employees	Injuries with respect to number of employees				
		Minor	Serious	Fatal	Total	%
BRANCH "MB KOLUBARA"	11.117	156	45	1	202	1,82
BRANCH "TPP-OPM KOSTOLAC" – OPEN PIT MINES	2.018	9	11	0	20	0,99
OPEN PIT MINES:	**13.135**	**165**	**56**	**1**	**222**	**1,69**
BRANCH "TPP NIKOLA TESLA"	2.205	22	6	0	28	1,27
BRANCH "TPP-OPM KOSTOLAC" – THERMAL POWER PLANTS	714	4	2	1	7	0,98
BRANCH "TPP-HP PANONSKE"	368	3	0	0	3	0,82
THERMAL POWER PLANTS:	**3.287**	**29**	**8**	**1**	**38**	**1,16**
BRANCH "HPP ĐERDAP"	708	7	1	0	8	1,13
BRANCH "HPP DRINSKO – LIMSKE"	427	3	1	0	4	0,94
BRANCH "RENEWABLE ENERGY SOURCES"	55	0	0	0	0	0,00
HYDROPOWER PLANTS:	**1.190**	**10**	**2**	**0**	**12**	**1,01**
PE EPS HEAD OFFICE	**780**	**8**	**1**	**0**	**9**	**1,15**
BRANCH "EPS SUPPLY"	**1.239**	**13**	**0**	**0**	**13**	**1,05**
TOTAL: PUBLIC ENTERPRISE "ELECTRIC POWER INDUSTRY OF SERBIA"	**19.631**	**225**	**67**	**2**	**294**	**1,50**

Note**:** Relevant data on deaths can be found within the chapters referring to the corresponding PE EPS Organizational Unit

Health protection of employees in PE EPS

Table 6 contains the data on health protection of employees which includes mandatory examinations upon entering employment, as well as periodic examinations performed with the aim of checking the work ability of employees, and which were performed in year 2022 in PE EPS Organizational Units.

Table 6

PUBLIC ENTERPRISE "ELECTRIC POWER INDUSTRY OF SERBIA"											
WORK ABILITY OF EMPLOYEES IN YEAR 2022											
Organizational Part	**Number of employees**	**Periodic examinations**				**Work ability**					
		Referred for examination		**Examined**		**Able**		**Limited ability**		**Unable**	
		number	**%**	**number**	**%**	**number**	**%**	**number**	**%**	**number**	**%**
BRANCH "MB KOLUBARA"	11.117	8.884	79,91	8.197	92,27	5.609	68,43	2.346	28,62	242	2,95
BRANCH "TPP-OPM KOSTOLAC" - OPM	2.018	1.284	63,63	1.277	99,45	1.124	88,02	127	9,95	26	2,04
OPEN PIT MINES	**13.135**	**10.168**	**77,41**	**9.474**	**93,17**	**6.733**	**71,07**	**2.473**	**26,10**	**268**	**2,83**
BRANCH "TPP NIKOLA TESLA"	2.205	1.792	81,27	1.782	99,44	1.593	89,39	171	9,60	18	1,01
BRANCH "TPP-OPM KOSTOLAC"	714	592	82,91	590	99,66	561	95,08	29	4,92	0	0,00
BRANCH " TPP-HP PANONSKE"	368	271	73,64	270	99,63	141	52,22	129	47,78	0	0,00
THERMAL POWER PLANTS	**3.287**	**2.655**	**80,77**	**2.642**	**99,51**	**2.295**	**86,87**	**329**	**12,45**	**18**	**0,68**
BRANCH "HPP ĐERDAP"	708	655	92,51	628	95,88	608	96,82	18	2,87	2	0,32
BRANCH "HPP DRINSKO–LIMSKE"	427	232	54,33	211	90,95	186	88,15	25	11,85	0	0,00
BRANCH "RENEWABLE ENERGY SOURCES"	55	37	67,27	37	100,00	36	97,30	0	0,00	1	2,70
HYDROPOWER PLANTS	**1.190**	**924**	**77,65**	**876**	**94,81**	**830**	**94,75**	**43**	**4,91**	**3**	**0,34**
PE EPS HEAD OFFICE	**780**	**0**	**0,00**	**0**	**0,00**	**0**	**0,00**	**0**	**0,00**	**0**	**0,00**
BRANCH "EPS SUPPLY"	**1.239**	**0**	**0,00**	**0**	**0,00**	**0**	**0,00**	**0**	**0,00**	**0**	**0,00**
TOTAL: PUBLIC ENTERPRISE "ELECTRIC POWER INDUSTRY OF SERBIA"	**19.631**	**13.747**	**70,03**	**12.992**	**94,51**	**9.858**	**75,88**	**2.845**	**21,90**	**289**	**2,22**

1. BRANCH "MINING BASIN KOLUBARA"

Branch MB "Kolubara" is a company the main activity of which is coal exploitation, processing and transport. In terms of organization, it consists of the Head Office and four organizational units:

1. Open pit mines
2. Processing plant
3. Project and
4. Metal

The following opet pit mines are active in the organizational unit "Open pit mines - Baroševac":

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

Environmental protection activities are performed by the Environmental Protection and Improvement Sector the role of which is to prevent, control, reduce and remediate all forms of environmental pollution. The Sector is organized into four Departments:

1. Environmental Protection and Improvement Department – organizational unit "Open pit mines-Baroševac";
2. Biological Reclamation Department;
3. Waste and Hazardous Substances Department; and
4. Environmental Protection and Improvement Department – organizational unit "Processing Plant" - Vreoci.

A. BRANCH "MB KOLUBARA" – OU "OPEN PIT MINES"

1.1. Permits overview and status

The overview and status of permits, licences and other necessary approvals realized in year 2022 is given in Table 7.

Table 7

BRANCH "MB Kolubara" – OU "OPEN PIT MINES"			
Overview and status of permits in year 2022			
Open pit mine	**Permits, licences and other necessary approvals, obtained in 2022 Poject name and status**	**New requests for obtaining or extending valid permits**	**Note**
Field E	Simplified mining design for coal excavation in the southern slope of the open pit mine "Field E"	-	Notice of the commencement of mining activities submitted on 22.03.2022
Tamnava West Field	-	-	-
Field G	Simplified mining design for extending the western boundary of the open pit mine "Field G" Simplified mining design for the inclusion of new equipment and rehabilitation of moving masses on the eastern slope of the mine Field G	-	Notice of the commencement of mining activities submitted on 15.06.2022 Notice of the commencement of mining activities submitted on 15.06.2022
Radljevo - north	-	-	-

1.2. Monitoring and environmental impact

1.2.1. Measuring air quality

During 2022, air quality measuring was performed in accordance with the Decision of the Republic inspector for environmental protection (see Point 1.4). At both measuring locations (Waterworks Medoševac and Baroševac), it was found that the limit value of PM_{10} particles concentration was exceeded. The limit value of suspended fractions PM_{10} is 50µg/m^3 and it was exceeded in 13 out of 15 sampling periods for the first measuring point (Baroševac). During two measuring periods, its value exceeded 100 µg/m^3. At the second measuring point (Waterworks Medoševac), the limit value of suspended fractions PM_{10} was exceeded in 14 out of 15 measurings, whereas one measuring rendered the result which exceeded the value of 100 µg/m^3.

When it comes to testing the concentrations of other substances in the air (SO_2, NO_2, soot, Pb, As, Ni and Cd in PM_{10}, As, in suspended praticles of PM_{10} fractions, PAH, CO, benzyl, toluene, ethyl benzene, o-xylene and m+p-xylene), it was established that the limit concentrations and maximum allowed concentrations were not exceeded.

1.2.2. Measuring the emission of substances affecting water quality

- **Water from the drainage system**

Water from the pre-drainage and drainage systems represents the technological part of the coal exploitation system. The water pumped out from these systems (mine waste water) is released without treatment through sedimentation tanks into the nearby recepients, as follows:

- OPM “Field E", Baroševac into the river Peštan and the river Turija, Medoševac into the river Peštan;
- OPM “Tamnava West Field" into the river Kolubara, and
- OPM “Field G" into the river Kolubara.

In accordance with the law, the quality control of recipients is performed by the authorised laboratory. The results of the quality of water pumped out from open pit mines (from the sedimentation tank into the recipient) for the year 2022 are shown in Table 8.

Table 8

BRANCH “MB KOLUBARA“– OU “OPEN PIT MINES“			
Water quality in 2022			
Parameters	**OPM “Field G"**	**OPM “Field E", Baroševac**	**OPM “Tamnava West Field"**
Electrical conductivity (µs/cm)	462 - 568	457 - 556	471 – 985
pH	7.4 - 7.8	7.3 - 7.6	7.1 - 7.6

- **Sanitary water**

The mines are supplied with drinking water from regional waterworks Medoševac, Kalenić, Junkovac, and Tamnava – East Field. The data on the quantity of waste water produced by mine drainage and the quantity of drinking water consumed in 2022 is given in Table 9. The quantity of produced sanitary waste water can be estimated on the basis of the quantity of delivered drinking water.

Table 9

BRANCH “MB KOLUBARA“– OU “OPEN PIT MINES“			
Water quantity in 2022 (m^3/year)			
Open pit mine	**Total quantity of pumped out water (m^3)**	**Plant / type of water**	**Drinking water-delivered**
Field E	4.808.873	**Waterworks Medoševac “Auxiliary Mechanization“**	1.279.367
FieldG	2.290.685	**Waterworks East Field Open Pit Mine “Field TE“**	163.150
Tamnava West Field	12.158.784		
Radljevo	234.716	**Waterworks Kalenić Open pit mine “Field TW“**	994.542
Auxiliary Mechanization	-		
TOTAL	**19.493.058**	**TOTAL**	**2.437.059**

1.2.3. Measuring the concentration of substances affecting soil quality

In 2022, soil quality was not measured because there is no legal obligation according to which the monitoring should be performed every year, especially because MAC and remedial values of tested heavy metals were not exceeded in the measurings conducted continuously in previous years. During 2021, soil quality was measured at 21 locations. After spatial analysis and comparison with the measurings from previous years, it was concluded that the detected excessive values of certain heavy metals originated from the natural background“.

- **Overview of expropriated and reclaimed areas**

The maintenance of reclaimed areas is envisaged by the Business plan at the Branch level, as well as temporary reclamation measures in new areas. Final reclamation measures are carried out after the cessation of mining activities, and on the basis of adopted Spatial Plan of the Kolubara region.

In the Biological Reclamation Department, the Forestry Office manages a reclaimed area of 611.30ha (forests and forest land). In the Forest Management Unit, within “Field D“, there are 49,28ha of expropriated forests and forest land.

In the Biological Reclamation Department, the Office of Agriculture carries out biological reclamation measures in a reclaimed area of 96,84ha. A reclaimed area of 10,56ha has been used for mining operations since 2022, for the needs of mine expansion. In addition, regular agricultural production is organized in expropriated plots of 13.60ha (expropriated areas amounting to 0.9ha are leased to third parties).

Table 10 presents an overview of areas expropriated and reclaimed by the year 2022.

Table 10

BRANCH "MB KOLUBARA"– BRANCH "OPEN PIT MINES" BAROŠEVAC																			
Overview of expropriated and reclaimed areas by the year 2022																			
Open pit mine/ Facility	Expropr. area (ha)	Area of land entered into the cadaster (ha)		Area of land the purpose of which was changed (ha)		Area of land containing structures (ha)		Areas of land used as dump site (ha)				Reclaimed area (ha)							
								Internal		External		Forrest		Arable land		Orchard		Nursery garden	
		up to 2021	in 2022	up to 2021	in 2022	up to 2021	in 2022	up to 2021	in 2022	up to 2021	in 2022	up to 2021	in 2022	up to 2021	in 2022	up to 2021	in 2022	up to 2021	in 2022
Field D	2.344,34	2.328,60	5,68	810,55	-0,31	18,65	0,00	1.230,57	-1,75	0,00	0,00	430,44	0,00	51,00	0,00	7,00	0,00	0,00	0,00
Field B	1.176,36	1.171,36	0,00	526,36	0,00	18,84	0,00	461,44	0,00	0,00	0,00	111,65	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Auxiliary mechanization	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
OPM Head office	4,53	4,39	0,00	0,67	0,00	4,07	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
South field	462,08	450,50	11,13	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	431,45	227,77	25,36	0,00	0,00	0,00	0,00	128,73	-50,28	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Field E	730,36	710,37	7,80	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	2.003,22	1.944,94	0,00	82,67	0,00	94,04	0,00	483,07	0,00	0,00	0,00	60,63	0,00	49,40	0,00	0,00	0,00	0,00	0,00
Field Veliki Crljeni	157,70	162,04	0,00	0,00	0,00	23,21	0,00	17,82	0,00	0,00	27,98	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Tamnava West Field	1.922,23	1.861,16	1,67	70,13	0,00	46,45	0,00	918,09	0,00	0,00	0,00	8,58	0,00	0,00	0.00	0,00	0,00	0,00	0.00
Radljevo	457,57	457,57	0,00	2,13	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
TOTAL:	9.693,82	9.374,32		1.499,81		222,42		3.187,69		27,98		611,30		100,40		7,00		0,00	

1.2.4. Measuring environmental noise

During the year 2022, measuring was performed by the authorised laboratory on the basis of the order issued by the republic inspector for environmental protection. The measuring of noise level showed excessive levels at two measuring points; at the first measuring point, inside residential premises in all three mesuring periods (day, evening, night) and at the second measuring point, during night for the zone along the main roads (zone 5). In the laboratory report, it is noted that the excessive levels were primarily caused by the intensity of traffic on the road Baroševac-Aranđelovac, along which the measuring points are located.

1.2.5. Waste

In year 2022, the activities of the Waste and Hazardous Substances Department referred to establishing the waste management system, procuring environmental protection equipment with respect to waste management, concluding contracts with authorised operators for the sale- disposal of waste, reporting to competend authorities, preparation of tender documentation and implementation of contracts for the sale of waste.

The waste generated in the Branch “Open Pit Mines Baroševac“ in year 2022 is presented in Table 11 as per the legal regulations of the Republic of Serbia within the field of waste management.

Table 11

BRANCH MB "KOLUBARA" – BRANCH "OPEN CAST MINES"										
Types of waste generated in 2022										
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**						
				"Field D"	**"Field B"**	**"Tamnava West Field"**	**"Tamnava East Field"**	**Auxiliary Machi.**	**Total:**	**Note**
	Name	**Index number**		**Generated waste quantities**						
1.	Waste printing toners other than those mentioned in 08 03 17	08 03 18	t	0,074	0,000	0,229	0,268	0,000	**0,571**	Waste printing toners
2.	Waste adhesives and sealants containing organic solvents or other hazardous substances	08 04 09*	t	0,000	0,000	0,000	0,163	0,000	**0,163**	Waste adhesives
3.	Scraping and processing of ferrometals	12 01 01	t	5,000	4,000	0,000	0,000	0,000	**9,000**	Iron and steel scrap, metal chip, clean waste ferrous metals chip without impurities, waste ferrous metals chip with impurities
4.	Spent waxes and fats	12 01 12*	t	0,300	0,000	0,150	0,000	0,000	**0,450**	Waste fat
5.	Mineral-based non-chlorinated hydraulic oils	13 01 13*/ 13 01 10*	t	0,000	0,000	1,400	0,000	0,000	**1,400**	Hydraulic oils
6.	Mineral-based non-chlorinated engine, gear and lubricating oils	13 02 05*	t	0,000	2,440	9,540	0,330	109,818	**122,128**	Engine oil, gear oils
7.	Mineral based non-chlorinated hydraulic oils	13 01 10*	t	0,000	0,000	0,000	0,350	0,000	**0,350**	Hydraulic oil
8.	Other insulating and heat transmission oils	13 03 10*	t	0,000	0,080	0,000	0,000	0,000	**0,080**	Transformer oils
9.	Oily water from oil/water separators	13 05 07*	t	25,020	0,000	10,000	0,000	0,000	**35,020**	Separator residue, liquid waste from the oil pit (emulsion)
10.	Other emulsions	13 08 02*	t	0,000	0,840	0,000	2,200	20,740	**23,780**	Waste emulsions, mechanical emulsions and solutions without halogenated matters, waste sludge from cleaning facilities
11.	Plastic packaging	15 01 02	t	0,200	0,360	0,000	0,000	0,000	**0,560**	Plastic packaging waste
12.	Packaging containing residues of or contaminated by hazardous substances	15 01 10*	t	0,000	1,590	1,840	0,000	5,050	**8,480**	Waste metal barrels of oil and lubricants, waste barrels of grease and oil,

BRANCH MB "KOLUBARA" – BRANCH "OPEN CAST MINES"										
Types of waste generated in 2022										
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**						
				"Field D"	**"Field B"**	**"Tamnava West Field"**	**"Tamnava East Field"**	**Auxiliary Machi.**	**Total:**	**Note**
	Name	**Index number**		**Generated waste quantities**						
										metal packaging of paints, varnishes and thinners
13.	Absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated by hazardous substances	15 02 02*	t	0,440	0,000	0,000	0,000	0,400	**0,840**	Oil and air filters, oily glass wool, work suits, cloths, work suits
14.	Absorbents, filter materials, wiping cloths and protective clothing other than those mentioned in 15 02 02	15 02 03	t	1,450	1,070	0,000	0,000	4,780	**7,300**	PP equipment, workwear, personal protective equipment, air filters
15.	End-of-life tyres	16 01 03/19 12 12	t	0,000	0,000	0,000	0,000	4,930	**4,930**	Pneumatics
				0,000	159,400	0,000	0,000	0,000	**159,400**	Steel cord conveyor belt, sealing rubber, scrapers, idler rings
16.	Oil filters	16 01 07*	t	0,000	0,000	0,000	0,000	9,513	**9,513**	Waste oil filters
17.	Brake pads containing asbestos	16 01 11*	t	0,000	0,000	0,000	0,000	0,100	**0,100**	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.	Lead batteries	16 06 01*	t	0,160	0,000	0,300	0,000	2,927	**3,387**	Lead-acid batteries
20.	Nickel-cadmium batteries	16 06 02*	t	0.200	0,000	0,000	0,000	0,000	**0,200**	Nickel-cadmium batteries
21.	Plastic, glass and wood containing hazardous substances or contaminated with hazardous substances	17 02 04*	t	6,830	0,000	0,000	0,000	0,000	**6,830**	Greased rubber-plastic seals and hydraulic hoses
22.	Copper, bronze, brass	17 04 01	t	0,420	0,000	0,000	0,000	0,000	**0,420**	Copper, copper strips, copper lacquer wire, insulated copper coils, scrap tin bronze, scrap aluminium bronze
23.	Iron and steel	17 04 05	t	31,500	59,000	0,000	0,000	0,000	**90,500**	Alloy steel (crawler track links, crusher hammers, excavator teeth)
				44,000	0,000	0,000	0,000	0,000	**44,000**	Iron and steel with rubber coating, padded idlers

BRANCH MB "KOLUBARA" – BRANCH "OPEN CAST MINES"										
Types of waste generated in 2022										
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**						
				"Field D"	**"Field B"**	**"Tamnava West Field"**	**"Tamnava East Field"**	**Auxiliary Machi.**	**Total:**	**Note**
	Name	**Index number**		**Generated waste quantities**						
				35,000	52,470	0,000	0,000	0,000	**87,470**	Iron over 6 mm (rails, parts of structures, idlers and shafts)
				44,200	18,740	0,000	16,800	0,000	**79,740**	Iron and steel up to 3 mm (plates, electrical switching cabinets, vulcanization container, sheet metal profiles, mixed category cabinets)
				158,500	9,620	15,860	0,000	0,000	**183,980**	Iron and steel over 3 mm (plates, idlers, shafts, structures, steel ropes, pieces of various sizes and shapes, unclassified, steel ropes, plates, steel bodies of idlers, structures, crates, pontoons, rails)
24.	Metal waste contaminated with hazardous substances	17 04 09*	t	1,040	0,000	0,000	0,000	0,000	**1,040**	Greased bearings
25.	Cables other than those mentioned in 17 04 10	17 04 11	t	19,500	0,000	0,000	0,000	0,000	**19,500**	High voltage copper cables incl. insulation, low voltage copper cables incl. insulation, telephone cable
26.	Discarded electrical and electronic equipment other than those mentioned in 20 01 21 and 20 01 23 containing hazardous components	20 01 35*	t	0,000	1,441	0,000	0,280	0,000	**1,721**	Electro-hydraulic thrusters, electronic equipment, other
27.	Discarded electrical and electronic equipment other than those mentioned in 20 01 21, 20 01 23 and 20 01 35	20 01 36	t	30,320	0,000	0,000	0,000	0,000	**30,320**	El. tools, devices and equipment (used electric machines and electric motors, tools, other)
28.	Plastics	20 01 39	t	0,000	0,570	0,000	0,000	0,000	**0,570**	Plastic rings,chairs, PET packaging

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

B.1. OU "PRERADA"

Within the Branch MB "Kolubara" - OU "Prerada", processing and refinement of open pit coal from the open cast mines "Field B/C" and "Field D" is carried out. The obtained coal is used to supply thermal power plants, general consumption, industry, etc.

The following organizational units are part of OU "Prerada":

- Operations Centre
- Dry Separation - plant
- Coal Refinement - plant
  - Wet Separation
  - Drying and Classification Plant
  - Heating Plant
  - Maintenance
- Railway transport - plant
- Coal and wastewater testing centre (accredited laboratory)

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

1.1. Overview and Status of Permits

The overview and status of permits for 2022 for OU "Prerada" is given in Table 12.

Table 12

BRANCH MB "KOLUBARA" - OU "PRERADA"			
Overview and Status of Permits in 2022			
Plant	**Permits, licenses and other necessary approvals, obtained in 2022 (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, the municipality of Lazarevac, for the needs of the OU "Prerada" (No. 325-04-0:433/2019-07).	-	Expiry date 14.07.2026
OU "Prerada", Vreoci	The water permit with a new validity period is issued to the applicant PE "Electric Power Industry of Serbia" Branch MB Kolubara OU "Prerada", for the storage of petroleum products for the needs of the "Heating Plant" facility and the discharge of atmospheric wastewater and steam condensate used for heating the fuel oil from the "Heating Plant" complex within the OU "Prerada", which is located at CP 1828/1 CM Vreoci, the municipality of Lazarevac on the territory of the city of Belgrade (No. 04.08-584512/1-2021)	-	Expiry date 31.10.2024
OU "Prerada", Vreoci	Decision: Approval is given to the operator PE "EPS", Branch MB Kolubara, OU Prerada - Vreoci for the continuous measurement of emissions from stationary sources of pollution in Heating Plant, Coal Refinement Plant Vreoci at the emitter Heating Plant Vreoci.	-	-

1.2. Monitoring and Environmental Impact

1.2.1. Air Quality Measurements

The air quality measurements in the vicinity of the organizational units of the Branch MB "Kolubara" are carried out as part of the network of the City of Belgrade for automatic monitoring of air quality.

The network of the City of Belgrade for automatic monitoring of air quality, which is under the jurisdiction of the City of Belgrade, includes, inter alia, the measuring points on the territory of the municipality of Lazarevac in the town centre, where soot, SO_2, NO_2, O_3 and PM_{10} are measured.

1.2.2. Emission Measurements of Air Pollutants

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

During 2022, individual measurements of air pollutant emissions were conducted by an accredited laboratory of the "Institute for Occupational Safety" JSC Novi Sad. The inspection program included measurements of flue gas conditions (temperature, pressure and humidity), volumetric flow rate, oxygen content, as well as mass concentrations and emission factors for sulfur dioxide (SO_2), nitrogen oxides (NO_x–NO_2), carbon monoxide (CO), hydrogen chloride, hydrogen fluoride and particulate matter.

The compliance with legal regulations was evaluated by comparing the measured emissions prescribed by the Regulation on limit values of air pollutant emissions from combustion installations (OG of the RS No. 6/2016) and the Large Combustion Plants Directive 2001/80/EC.

Table 13 provides an overview of the results of individual measurements of air pollutant emissions affecting the air quality for the Heating Plant Vreoci, conducted in 2022.

Table 13

BRANCH MB "KOLUBARA" - OU "PRERADA"		
Individual measurements of air pollutant emissions affecting the air quality in 2022		
Mass concentrations of air pollutants (mg/Nm^3)		
Heat output MWth 120 (2 x 60MW)		
Organizational unit	**Heating Plant Vreoci**	
Boiler	**1**	**2**
Date	**18.04.2022**	**15.04.2022**
SO_2	3.231,89	3.362,73
NO_x (NO_2)	179,11	175,69
CO	167,28	200,35
Particulate matter	139,28	148,40

Note: Pursuant to the Regulation on limit values of air pollutant emissions from combustion installations ("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 they are included in the preliminary application for the National plan of Emission Reduction Plan from the stationary large combustion installations from the date of entry into force of the said Regulation. Heating Plant Vreoci is included in the National Emission Reduction Plan.

On April 14, 2022, OU Prerada received the Decision from the Ministry of Environmental Protection, by which it obtained the approval for the continuous measurement of emissions from stationary sources of pollution in Heating Plant, Coal Refinement Plant Vreoci at the emitter Heating Plant Vreoci. The results of the continuous measurement of emissions from Heating Plant are shown in Table 14 for the year 2022.

Table 14

BRANCH MB "KOLUBARA" - OU "PRERADA"				
Air pollutant emissions for the year 2022 (t/year)				
Facility	**Heating Plant Vreoci**			
	Particulate matter	**SO_2**	**NO_x (NO_2)**	**CO_2**
BOILER 1	215,24	2.828,56	143,41	152.936,69
BOILER 2				
TOTAL: BRANCH MB "KOLUBARA" - OU "PRERADA"	**215,24**	**2.828,56**	**143,41**	**152.936,69**

Table 15 shows the fuel consumption for the OU "Prerada" for the year 2022.

Table 15

BRANCH MB "KOLUBARA" - OU "PRERADA"		
Fuel consumption in 2022		
Facility	**Heating Plant Vreoci**	
	t/year	
	coal	**fuel oil**
BOILER 1	191.519,00	433,50
BOILER 2		
TOTAL: BRANCH MB "KOLUBARA" - OU "PRERADA"	**191.519,00**	**433,50**

1.2.3. Emission Measurements of Water Pollutants

Process water is used in technological processes and coal refinement (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 includes the "Vreoci" waterworks, supplying potable water to industrial facilities and the Vreoci village.

Wastewater is generated during the technological process of lignite processing and refinement (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, Emscher filters, secondary sedimentation tank, lagoons and purified water collectors. The treated water from the wastewater treatment plant is discharged through the gauging 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 at the entrance to the treatment system;
- wastewater at the exit from 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, sulfates, specific conductivity, ammonia, total nitrogen, chloride, $KMnO_4$ demand, COD, BOD_5, iron, manganese, and filtered water vaporisation residue, unfiltered water vaporisation residue, suspended solids, sedimentary matter, phenolic 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 Medoševac).

During 2022, testings were carried out by the authorized and accredited laboratory of the "Institute for Occupational Safety" JSC 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 Management Company

"Srbijavode", City Administration - Department for Utilities and Housing Services - Water Division, PE "Electric Power Industry of Serbia", and the Secretariat (Environmental Protection Division - Belgrade).

Table 16 shows the groundwater quality data analysis in the vicinity of the wastewater treatment plant. The evaluation of compliance with legal regulations was carried out by comparing the values of concentrations of groundwater pollutants measured in piezometers with remediation values of hazardous and harmful substances concentrations and values that may indicate considerable groundwater contamination.

Table 16

BRANCH MB "KOLUBARA" - OU "PRERADA"		
Groundwater quality in 2022		
Concentration	**PB[1]**	**Wastewater treatment plant**
Arsenic (mg/l)	0,06	The measured values range from <0,01-0,16
Phenols (mg/l)	/	The measured values range from <0,006 - <0,024
Mineral oils (mg/l)	0,6	All measured values are below remediation value (<0,01-0,15)

PB[1] - remediation values of concentrations of hazardous and harmful substances and values potentially indicating considerable groundwater contamination under the Regulation on limit values of polluting, harmful and hazardous substances in soil ("Off. Gazette of the RS", No. 30/2018 and 64/19)

Table 17 shows the analysis of groundwater quality data in the vicinity of the ash and slag landfill in Medoševac. The evaluation of compliance with legal regulations was carried out by comparing the values of concentrations of groundwater pollutants measured in piezometers with remediation values of concentrations of hazardous and harmful substances and values that may indicate considerable groundwater contamination.

Table 17

BRANCH MB "KOLUBARA" - OU "PRERADA"		
Groundwater quality in 2022		
Concentration	**PB[1]**	**Medoševac – ash and slag landfill**
Arsenic (mg/l)	0,06	All measured values are below remediation value (<0,01)
Phenols (mg/l)	/	The measured values range from <0,006 - <0,024
Mineral oils (mg/l)	0,6	All measured values are below remediation value (<0,02)

PB[1] - remediation values of concentrations of hazardous and harmful substances and values potentially indicating considerable groundwater contamination under the Regulation on limit values of polluting, harmful and hazardous substances in soil ("Off. Gazette of the RS", No. 30/2018 and 64/19)

Table 18 shows the analysis of wastewater quality data at the wastewater treatment plant inlet and outlet in 2022.

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

Table 18

BRANCH MB "KOLUBARA" - OU "PRERADA"		
Wastewater treatment plant operating results in 2022		
Parameter	**Concentration (mg/l)**	
Pollutant	**Plant inlet**	**Plant outlet**
Suspended solids	1.450,00 - 5.740,00	635,00 - 1.730,00
Organic substances COD	1.742,40 - 3.859,00	747,74 - 1.509,21
Phenols	0,613 - 3,442	0,037 - 4,01
Arsenic	0,248 - 5,98	0,199 - 6,61

1.2.4. Emission Measurements of Soil Pollutants

During 2022, 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 Regulation on systematic monitoring of soil condition and quality ("Official Gazette of the 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 2022 was performed by the accredited laboratory of the “Institute for Occupational Safety“ JSC 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 Drying Plant, about 380 m from the building, 50 m from the railway. In a clean area 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 2022.

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 Regulation on noise indicators, limit values, methods for assessing noise indicators, disturbance and harmful effects of noise on the environment (“Official Gazette of the RS”, No. 75/10).

Table 19

BRANCH MB “KOLUBARA“ - OU “PRERADA“					
Noise level in 2022 dB (A)					
Limit values of noise indicators Regulation on noise indicators, limit values, methods for assessing noise indicators, disturbance and harmful effects of noise on the environment (“Official Gazette of the RS”, No. 75/10).	*Indoors			For day and evening	For night
				35	30
	In an open area	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 the highways, main roads and city roads		65	55
		Industrial, warehouses, 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 Processing Plant	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 06:00 - 18:00	57,2		57	52,5	53
	63,5		64	58,9	59
4 For day and evening 18:00 - 22:00	64,6		65	52,2	52

*Noise level $L_{Aeq,30min.}$ dB(A) day and evening **Relevant noise level $L_{RAeq,30min.}$ dB(A).

1.2.6. Waste

Waste amounts generated in 2022 for OU “Prerada“ are shown in Table 20 according to the legislation of the Republic of Serbia in the field of waste management.

Table 20

BRANCH MB "KOLUBARA" - OU "PRERADA"					
Generated types of waste in 2022					
Rulebook on categories, testing and classification of waste ("Official Gazette of the RS", No. 56/2010, 93/2019 and 39/2021)					
No.	**Name**	**Index number**	**Unit**	**Waste amount**	**Note**
1.	Waste printing toner other than those mentioned in 08 03 17	08 03 18	t	0,740	Waste printing toners
2.	Scraping and processing of ferrometals	12 01 01	t	0,450	Metal chip
3.	Mineral-based non-chlorinated engine, gear and lubricating oils	13 02 05*	t	0,950	Gear oils
4.	Other emulsions - waste oils not otherwise specified	13 08 02*	t	1,180	Oily water
5.	Plastic packaging	15 01 02	t	0,360	PET packaging
6.	Packaging containing residues of or contaminated by hazardous substances	15 01 10*	t	0,410	Waste barrels of grease and oil
7.	Absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated by hazardous substances	15 02 02*	t	0,050	Oily filters
8.	End-of-life tyres	16 01 03	t	0,025	Fabric core conveyor belts
9.	Lead batteries	16 06 01*	t	0,220	Lead-acid batteries
10.	Nickel-cadmium batteries	16 06 02*	t	0,740	Nickel-cadmium batteries
11.	Tiles and ceramics	17 01 03	t	0,014	Sanitary facilities
12.	Wood	17 02 01	t	0,250	Wood waste
13.	Plastic	17 02 03	t	0,003	Sanitary facilities
14.	Iron and steel	17 04 05	t	24,405	Iron and steel over 3 mm
				32,404	Iron and steel under 3 mm
				2,120	Iron and steel with rubber coating (padded idlers)
15.	Cables other than those mentioned in 17 04 10	17 04 11	t	0,300	High voltage cables
16.	Insulation materials containing asbestos	17 06 01*	t	0,030	Roof covers - asbestos-cement boards
17.	Insulation materials other than those mentioned in 17 06 01 and 17 06 03	17 06 04	t	2,240	Sandwich panels
18.	Saturated or spent ion exchange resins	19 09 05	t	9,000	Ion exchange resins
19.	Plastic and rubber	19 12 04	t	1,000	Waste conveyor belt
20.	Paper and cardboard	20 01 01	t	2,480	Paper and cardboard
21.	Fluorescent tubes and other mercury-containing waste	20 01 21*	t	0,131	Fluorescent tubes
22.	Discarded electrical and electronic equipment other than those mentioned in 20 01 21, 20 01 23 and 20 01 35	20 01 36	t	0,431	Various el. equipment
23.	Plastics	20 01 39	t	2,000	Koterm plates

B.2. OU "KOLUBARA - METAL"

Branch MB "Kolubara" – 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 parts;
- Overhaul unit: overhaul of mining equipment, machine parts washing, cleaning of oily and greasy surfaces of 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 parts and assemblies in workshops, revitalization and regeneration of electrical equipment, maintenance of power and telecommunication facilities on-site, and car and electrical equipment washing;
- Maintenance.

All units were constructed based on valid designs and they possess usage permits.

1.1. Overview and Status of Permits

There were no new permits for OU "Kolubara-Metal" in 2022. The overview and status of inspection controls and decisions are given in Table 21.

Table 21

BRANCH MB "KOLUBARA" - OU "KOLUBARA-METAL"		
Overview and status of inspection controls and decisions in 2022		
No.	**Reference**	**Name**
1.	501-27/2022-08, 21.04.2022.	The order for office inspection supervision in the ELMONT Unit
2.	501-27/2022-08, 29.04.2022.	Record of inspection supervision in the ELMONT Unit

1.2. Monitoring and Environmental Impact

1.2.1. Emission Measurements of Air Pollutants

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

In accordance with the Contract no. E-04.04-40289/7-2022 dated 09.03.2022 for the provision of service "Air Quality Analysis", individual measurements of pollutant emissions into the air were performed by the accredited laboratory of the "Institute for Occupational Safety" JSC Novi Sad. The inspection program included measurement of flue gas conditions (temperature, pressure and humidity), volumetric flow rate, as well as mass concentrations and emission factors for sulfur dioxide (SO_2), nitrogen oxides (NO_x - NO_2), particulate matter and organic compounds expressed as total carbon.

The measured emission values were compared with the emission limit values prescribed by the Regulation on measuring emissions of pollutants in the air from stationary sources of pollution ("Official Gazette of RS", No. 5/16). The results of emission measurements are shown in Tables 22 and 23, at measuring points.

Table 22

BRANCH MB "KOLUBARA" - OU "KOLUBARA-METAL"			
Emission Measurements of Air Pollutants in 2022 – Montaža Unit			
Emitted pollutant	**Montaža Unit coal-fired boiler (E_M) (mg/Nm^3)**	**ELV (mg/Nm^3)**	**Evaluation of the results**
CO	2.792,35	350	Not compliant with legal regulations*
SO_2	1.584,58	1.700	Compliant with legal regulations*
Nitrogen oxides expressed as NO_2	260,82	650	Compliant with legal regulations*

E_M- the highest value of the pollutant emission measurement results reduced by the value of the measurement uncertainty.
*Legal regulations: Regulation on measuring emissions of pollutants in the air from stationary sources of pollution ("Official Gazette of RS", No. 5/16)

Table 23

BRANCH MB "KOLUBARA" - OU "KOLUBARA-METAL"			
Emission Measurements of Air Pollutants in 2022 – ELMONT Unit			
Emitted pollutant	**ELMONT Unit - coal-fired boiler (E_M) (mg/Nm^3)**	**ELV (mg/Nm^3)**	**Evaluation of the results**
CO	1.420,38	350	Not compliant with legal regulations*
SO_2	899,95	1.700	Compliant with legal regulations*
Nitrogen oxides expressed as NO_2	114,52	650	Compliant with legal regulations*
Particulate matter	166,76	150	Not compliant with legal regulations*

E_M- the highest value of the pollutant emission measurement results reduced by the value of the measurement uncertainty.
*Legal regulations: Regulation on measuring emissions of pollutants in the air from stationary sources of pollution ("Official Gazette of RS", No. 5/16)

The results of the analysis confirm that there is an emission exceedance, according to the Regulation on measuring emissions of pollutants in the air from stationary sources of pollution ("Official Gazette of RS", No. 5/16) for boiler rooms in Montaža Unit and ELMONT Unit in Lajkovac. The stated exceedance for carbon monoxide (SO) and total particulate matter, which occurred in the boiler rooms of Montaža and ELMONT Units, occurred partly due to the obsolescence of the boilers and congestion during firing.

The results of measuring the emission of pollutants into the air from production capacities in the area of the Production unit are shown in Table 24 for a series of measurements outside the heating season, at measuring points.

Table 24

BRANCH MB "KOLUBARA" - OU "KOLUBARA-METAL"					
Emission Measurements of Air Pollutants in 2022 - Production Unit					
Emitted pollutant	**Production Unit— "GOSTOL" line (E_M) (mg/Nm^3)**	**Production Unit— Steel Structure Hall (left outlet) (E_M) (mg/Nm^3)**	**Production Unit - Plasma cutter (E_M) (mg/Nm^3)**	**ELV (mg/Nm^3)**	**Evaluation of the results**
Nitrogen oxides expressed as NO_2	<2,05	<2,05	<2,05	350	Compliant with legal regulations*
SO_2	<2,86	<2,86	<2,86	350	Compliant with legal regulations*
Particulate matter	19,36	0,84	3,56	150	Compliant with legal regulations*

E_M- the highest value of the pollutant emission measurement results reduced by the value of the measurement uncertainty.
*Legal regulations: Regulation on measuring emissions of pollutants in the air from stationary sources of pollution ("Official Gazette of RS", No. 5/16); Regulation on limit values of air pollutant emissions from stationary sources of pollution, except from combustion installations ("Off. Gazette of RS", No. 111/2015) - Appendix, General emission limit values, Emission limit values for total particulate matter and Emission limit values for inorganic gaseous substances.

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 25 and 26, at meauring points.

Table 25

BRANCH MB "KOLUBARA" - OU "KOLUBARA-METAL"			
Emission Measurements of Air Pollutants in 2022 - Production Unit			
Emitted pollutant	**Montaža Unit- coal-fired boiler ($E_м$) (mg/Nm^3)**	**ELV (mg/Nm^3)**	**Evaluation of the results**
CO	1.935,0	1.000	Not compliant with legal regulations*
Particulate matter	/	90	/

$E_м$- the highest value of the pollutant emission measurement results reduced by the value of the measurement uncertainty.
*Legal regulations: Regulation on measuring emissions of pollutants in the air from stationary sources of pollution ("Official Gazette of RS", No. 5/16); Regulation on limit values of air pollutant emissions from combustion installations ("Off. Gazette of RS", No. 6/16, 67/21)

Table 26

BRANCH MB "KOLUBARA" - OU "KOLUBARA-METAL"			
Emission Measurements of Air Pollutants in 2022 - ELMONT Unit			
Emitted pollutant	**ELMONT Unit- coal-fired boiler ($E_м$) (mg/Nm^3)**	**ELV (mg/Nm^3)**	**Evaluation of the results**
CO	1.830,83	150	Not compliant with legal regulations*
SO_2	865,51	1.000	Compliant with legal regulations*
Nitrogen oxides expressed as NO_2	119,47	500	Compliant with legal regulations*
Particulate matter	328,95	20	Not compliant with legal regulations*

$E_м$- the highest value of the pollutant emission measurement results reduced by the value of the measurement uncertainty.
*Legal regulations: Regulation on measuring emissions of pollutants in the air from stationary sources of pollution ("Official Gazette of RS", No. 5/16); Regulation on limit values of air pollutant emissions from stationary sources of pollution, except from combustion installations ("Off. Gazette of RS", No. 111/15, 83/21) - Appendix, General emission limit values, Emission limit values for total particulate matter and Emission limit values for inorganic gaseous substances.

1.2.2. Emission Measurements of Matters 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 were 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, $KMnO_4$ demand, COD, BOD_5, 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 27, 28 and 29.

Table 27

BRANCH KOLUBARA MB – OU "KOLUBARA-METAL" Wastewater physical-chemical testing for 2022 – first quarter Sampling performed on 09.03.2022.							
Tested parameter	**Measured value**						**Reference value ***
	I	**II**	**III**	**IV**	**V**	**VI**	
Water temperature (˚C)	8,7	8,4	13,5	-	8,8	4,7	30
Turbidity (NTU)	45,6	82,5	79,5	-	27,7	426	-
Conductivity (µS/cm)	686	760	589	-	618	771	-
Total phosphorus (mg/l)	0,92	0,40	0,10	-	0,20	0,22	-
Fe (mg/l)	1,29	3,73	1,98	-	0,517	6,25	-
Mn (mg/l)	0,241	0,15	0,29	-	0,069	0,61	-
As (mg/l)	<0,01	0,015	0,02	-	<0,01	0,039	-
Mineral oil (TPH) (mg/l)	2,53	70,83	0,045	-	5,12	0,819	10
Total number of faecal coliform bacteria (cfu/100ml)	$2,5x10^4$	$8x10^2$	$1,8x10^4$	-	$3,5x10^5$	$1,3x10^4$	-

Table 28

BRANCH KOLUBARA MB – OU "KOLUBARA-METAL" Wastewater physical-chemical testing for 2022 – second quarter Sampling performed on 20.07.2022.							
Tested parameter	**Measured value**						**Reference value ***
	I	**II**	**III**	**IV**	**V**	**VI**	
Water temperature (˚C)	29,0	26,5	22,5	-	24,2	24,3	30
Turbidity (NTU)	52	48,19	20,21	-	1,90	6,97	-
Conductivity (µS/cm)	645	470	629	-	668	489	-
Total phosphorus (mg/l)	0,56	0,04	0,18	-	0,37	0,05	-
Fe (mg/l)	0,635	3,07	0,838	-	0,659	0,640	-
Mn (mg/l)	0,770	0,255	0,072	-	0,090	0,215	-
As (mg/l)	<0,01	0,023	<0,01	-	<0,01	0,017	-
Mineral oil (TPH) (mg/l)	2,722	7,582	0,167	-	0,381	0,435	10
Total number of faecal coliform bacteria (cfu/100ml)	$5,5x10^4$	$1,3x10^4$	$1,7x10^5$	-	$6,5x10^4$	$1,1x10^4$	-

Table 29

BRANCH KOLUBARA MB – OU "KOLUBARA-METAL" Wastewater physical-chemical testing for 2022– third quarter Sampling performed on 26.10.2022.							
Tested parameter	**Measured value**						**Reference value ***
	I	**II**	**III**	**IV**	**V**	**VI**	
Water temperature (˚C)	20,2	19,8	21,6	17,9	18,8	18,7	30
Turbidity (NTU)	75	111	19,82	4,43	2,21	9,26	-
Conductivity (µS/cm)	668	539	659	546	766	442	-
Total phosphorus (mg/l)	0,47	0,27	0,15	0,02	0,70	0,08	-
Fe (mg/l)	9,85	39,68	3,45	1,08	0,853	3,50	-
Mn (mg/l)	0,419	1,55	0,154	0,041	0,095	0,44	-
As (mg/l)	<0,01	0,097	0,052	<0,01	<0,01	0,039	-
Mineral oil (TPH) mg/l)	1,246	1,714	<0,01	0,838	0,040	0,022	10
Total number of faecal coliform bacteria (cfu/100ml)	$8,3x10^4$	$2,3x10^3$	$1,4x10^4$	$1,1x10^4$	$8,7x10^5$	$1,0x10^5$	-

* 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 some 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.

For the samples taken, the examined parameters meet the values prescribed by the Regulation on limit values for the emission of polluting substances into water and deadlines for reaching them ("Official Gazette of the RS", no. 67/2011, 48//2012 and 1/2016). Emission limit values of waste

water containing mineral oils, table 4.1. Emission limit values at the point of discharge into surface waters.

Based on the presented results, it is concluded that the efficiency of wastewater treatment is satisfactory and that the wastewater exiting the separators is characterized of a satisfactory quality, in terms of reaching the values prescribed by the Regulation and that the separators perform their function. Also, the concentration of suspended matter, organic substances (COD) increases significantly, and the concentration of iron, phenol and arsenic varies significantly in the wastewater at the exit from the separator.

In the OU "Kolubara Metal", for physico-chemical and microbiological analyzes of wastewater, sampling was carried out on 02.03.2022, by the Institute for Occupational Safety and Health A.D. from Novi Sad, on the basis of the Agreement on the provision of wastewater analysis services No. 20600-E.04.04-102671/17-2021 as of August 18, 2021 at the following measuring points:

- ENTRANCE to the PUTOKS plant- entrance shaft, in front of the basin with overflow barriers; and
- EXIT from PUTOKS plant- exit shaft, on the drainage line from the plant with the pumps (which are not in operation).

The results of the municipal wastewater analysis for the year 2022 are given in Table 30.

Table 30

BRANCH KOLUBARA MB – OU "KOLUBARA-METAL"			
Municipal wastewater analysis results for 2022			
Tested parameter	**Measured value**		**Reference value***
	PUTOKS INLET	**PUTOKS OUTLET**	
Water temperature (˚C)	12,7	12,6	-
Turbidity (NTU)	5,43	7,32	-
Conductivity (µS/cm)	676	718	-
Total phosphorus (mg/l)	0,41	0,67	-
Fe (mg/l)	0,306	0,426	-
Mn (mg/l)	0,163	0,163	-
As (mg/l)	<0,01	<0,01	-
Mineral oil (TPH) (mg/l)	0,046	0,038	-
Total number of faecal coliform bacteria (cfu/100ml)	$3,9x10^5$	$9,7x10^3$	-

*** Reference value** is given in accordance with the Regulation stipulating emission limit values for pollutants in water and deadlines for their achievement, Paragraph III Municipial wastewater („OG RS", No. 55/05, 71/05-correction 101/07, 65/08 and 16/11).

Emission limit values for municipal wastewater discharged into the recipient for the year 2022 are given in Table 31.

Table 31

BRANCH KOLUBARA MB – OU "KOLUBARA-METAL"		
Emission limit values for municipal wastewater discharged into the recipient for the year 2022		
Parameter	**Emission limit value**	**The smallest reduction percentage (I)**
a. Emission limit values on the secondary purification device		
Biochemical oxygen demand (BOD5 on 20ºC) (II, VI, VII)	25 mg O_2/l 40 mg O_2/l (III)	70-90
Chemical oxygen demand (COD)(VI)	125 mg O_2/l	75
Total suspended matter (IV, VIII)	35 mg/l (more than 10.000 EC) 60 mg/l (2.000 to 10.000 EC)	90 70
б. Emission limit values on the tertiary purification device		
Total phosphorus	2 mg/l P (1.000 to 100.000 EC) 1 mg/l P (more than 100.000 EC)	80
Total nitrogen (V)	15 mg/l N (10.000 to 100.000 EC) 10 mg/l N (more than 100.000 EC)	70-80

(I) Reduction in relation to the load of incoming wastewater
(II) The parameter can be replaced by some other parameter: total organic carbon (TOC) or total chemical oxygen consumption (COD Total), if the dependence between BOD5 and these parameters can be established.
(III) If it is proven that the discharged wastewater after treatment will not adversely affect the quality of the watercourse
(IV) Suspended matter is not a mandatory parameter.
(V) Total nitrogen: organic N + NH4-N + NO3-N + NO2-N.
(VI) Homogenized, unfiltered, undecanted sample.

(VII) Addition of nitrification inhibitor..
(VIII) Filtration of a representative sample through a 0.45 μm membrane filter. Drying at 105oC and weighing.

The results of the analysis of wastewater at the exit from the PUTOKS plant (which is not in operation) show a satisfactory quality for municipal wastewater, according to the Regulation, for discharge into the recipient.

1.2.3. Waste

Waste amounts generated in 2022 for OU "Kolubara Metal", are shown in the Table 32 according to Serbian Waste Management Legislation.

Table 32

BRANCH MB KOLUBARA - OU "KOLUBARA - METAL"					
Generated types of waste in 2022					
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.	Waste paint and varnishes with a past expiration date	08 01 11*	t	3,730	Waste paint and varnishes with a past expiration date
2.	Waste toners for printing other than that specified in 080317*	08 03 18	t	0,240	Waste toners
3.	Waste soot	10 01 14*	t	0,020	Waste soot from the boiler house
4.	Scraping and processing of ferrometals	12 01 01	t	73,402	Metal scrapings
5.	Scraping and processing of bronze and brass	12 01 03	t	11,645	Waste bronze scrapings
6.	Mineral non-chlorinated hydraulic oils	13 01 10*	t	3,710	Waste hydraulic oil
7.	Mineral non-chlorinated motor oils (gearbox oil)	13 02 05*	t	1,910	Waste motor (gearbox) oil
8.	Other emulsions	13 08 02*	t	52,000	Sludge from the washing area
9.	Packaging containing residues of hazardous substances or contaminated with hazardous substances	15 01 10*	t	0,700	Waste barrels from grease and oil
10.	Packaging containing residues of hazardous substances or contaminated with hazardous substances	15 01 10*	t	0,580	Metal packaging of paints, varnishes and thinners
11.	Absorbents, filter materials (including oil filters not otherwise specified), wipes, protective clothing, contaminated with hazardous substances	15 02 02*	t	4,625	Oily wiping cloth,wipes, working suits
12.	Air filters	15 02 03	t	1,100	Air filters
13.	Lead batteries	16 06 01*	t	2,650	Lead-acid batteries
14.	Copper, bronze, brass	17 04 01	t	5,100	Copper lacquer wire
15.	Copper, bronze, brass	17 04 01	t	3,270	Bronze in one piece
16.	Iron and steel	17 04 05	t	5,400	Under 3 mm (sheet metal, profiles, cabinets, mixed categories...)
		17 04 05	t	50,240	Over 3 mm (pieces of various sizes and shapes, unclassified, steel ropes, sheets, steel body idlers, structures, crates...)
		17 04 05	t	117,940	Over 6 mm rails, structure parts...)
		17 04 05	t	5,360	Damaged parts, gears, axles, shafts
17.	Metal waste contaminated with hazardous substances	17 04 09*	t	6,020	Greased roller bearings
18.	Waste cables - high voltage and low voltage with insulation	17 04 11	t	7,400	Waste cables - high voltage and low voltage with insulation (Telephone cables

19.	Insulation materials different than those stated in 17 06 01 и 17 06 03	17 06 04	t	3,000	Waste sandwich panels
20.	Waste rubber strips	19 12 04	t	36,000	Rubber strips from scraped drum rubber coating
21.	Other wastes (including mixtures of materials) from mechanical treatment of waste containing hazardous substances	19 12 11*	t	5,650	Greased rubber-plastic seals
22.	Waste paper and cardboard	20 01 01	t	1,100	Waste paper and cardboard
23.	Fluorescent tubes and other waste containing mercury	20 01 21*	t	0,120	Fluo tubes

The cumulative amount of waste for the Kolubara MB (Open Pit Mines “Baroševac”, OU“Prerada” and “Kolubara-Metal”) generated in 2022 is shown in the Table 33 in accordance with Serbian Waste Management Legislation.

Table 33

BRANCH „MB KOLUBARA“ - OU „OPEN PIT MINES“, OU„PROCESSING PLANT“ AND OU„KOLUBARA METAL“													
No	**The Rulebook on categories, testing and classification of waste ("Official Gazette of RS" No. 56/2010, 93/2019 and 39/2021)**		**Unit**	**Generated types of waste in 2022**									
				“Field D “	**“ Field D “**	**“Tamnava – West Field”**	**“Tamnava – East Field“**	**Auxiliary machinery**	**Total: OPM**	**Total: Procesing Plant**	**Total: Kolubara Metal**	**Total: MB Kolubara**	**Note**
	Name	**Index No.**		**Waste amounts**									
1.	Waste paint and varnishes with a past expiration date	08 01 11*	t	0,000	0,000	0,000	0,000	0,000	**0,000**	**0,000**	**3,730**	**3,730**	Waste paint and varnishes with a past expiration date
2.	Waste toner for printing other than that specified in 08 03 17	08 03 18	t	0,074	0,000	0,229	0,268	0,000	**0,571**	**0,740**	**0,240**	**1,551**	Waste toners
3.	Waste glues and seals containing organic solvents or other hazardous substances	08 04 09*	t	0,000	0,000	0,000	0,163	0,000	**0,163**	**0,000**	**0,000**	**0,163**	Waste glue
4.	Waste soot	10 01 14*	t	0,000	0,000	0,000	0,000	0,000	**0,000**	**0,000**	**0,020**	**0,020**	Waste soot from the Boiler Room
5.	Scraping and processing of ferrometals	12 01 01	t	5,000	4,000	0,000	0,000	0,000	**9,000**	**0,450**	**73,402**	**82,852**	Iron and steel shavings, metal scrapings, clean waste ferrometal scrapings without impurities, ferrous metal waste scrapings with impurities
6.	Scraping and processing of non-ferrous metals	12 01 03	t	0,000	0,000	0,000	0,000	0,000	**0,000**	**0,000**	**11,645**	**11,645**	Waste bronze scrapings
7.	Used wax and lubricants	12 01 12*	t	0,300	0,000	0,150	0,000	0,000	**0,450**	**0,000**	**0,000**	**0,450**	Waste grease
8.	Mineral non-chlorinated hydraulic oils	13 01 13*/13 01 10*	t	0,000	0,000	1,400	0,350	0,000	**1,750**	**0,000**	**3,710**	**5,460**	Waste hydraulic oils
9.	Mineral non-chlorinated motor oils, transmission oils and lubricants	13 02 05*	t	0,000	2,440	9,540	0,330	109,818	**122,128**	**0,950**	**1,910**	**124,988**	Motor oil, gearbox oils
10.	Other oils for insulation and heat transfer	13 03 10*	t	0,000	0,080	0,000	0,000	0,000	**0,080**	**0,000**	**0,000**	**0,080**	Transformer oil

11.	Oily water from oil/water separators	13 05 07*	t	25,020	0,000	10,000	0,000	0,000	**35,020**	**0,000**	**0,000**	**35,020**	Sludge from separators, liquid waste from the oil pit (emulsion)
12.	Other emulsions	13 08 02*	t	0,000	0,840	0,000	2,200	20,740	**23,780**	**1,180**	**52,000**	**76.960**	Waste emulsions, mechanical emulsions and solutions without halogenated matters, Waste sludge from washing points
13.	Plastic containers	15 01 02	t	0,200	0,360	0,000	0,000	0,000	**0,560**	**0,360**	**0,000**	**0.920**	Waste plastic containers
14.	Packaging containing residues of hazardous substances or contaminated with hazardous substances	15 01 10*	t	0,000	1,590	1,840	0,000	5,050	**8,480**	**0,410**	**1,280**	**10,170**	Waste metal barrels from oil and lubricants, waste barrels from oil and lubricants, metal packaging of paints, varnishes and thinners Oil and air filters, oilywiping cloth, working clothes, wiping cloth
15.	Absorbents, filter materials (including oil filters not otherwise specified), wipes, protective clothing, contaminated with hazardous substances	15 02 02*	t	0,440	0,000	0,000	0,000	0,400	**0,840**	**0,050**	**4,625**	**5,515**	Oil and air filters, oilywiping cloth, working clothes, wiping cloth
16.	Absorbent, filter materials, wiping cloths and protective clothing, different thann those specified in 15 02 02	15 02 03	t	1,450	1,070	0,000	0,000	4,780	**7,300**	**0,000**	**1,100**	**8,400**	Safety equipment, working clothes, personal protective items, air filters
17.	Waste rubber	16 01 03/19 12 12	t	0,000	0,000	0,000	0,000	4,930	**4,930**	**0,000**	**0,000**	**4,930**	Pneumatics
				0,000	159,400	0,000	0,000	0,000	**159,400**	**0,025**	**0,000**	**159.425**	Conveyor belt with steel cord, sealing rubber, scrapers, idler rings
18.	Oil filters	16 01 07*	t	0,000	0,000	0,000	0,000	9,513	**9,513**	**0,000**	**0,000**	**9,513**	Waste oil filters
19.	Brake pads containing asbestos	16 01 11*	t	0,000	0,000	0,000	0,000	0,100	**0,100**	**0,000**	**0,000**	**0,100**	Waste from asbestos braids and brake linings

20.	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
21.	Lead batteries	16 06 01*	t	0,160	0,000	0,300	0,000	2,927	**3,387**	**0,220**	**2,650**	**6,257**	Lead batteries
22.	Nickel-cadmium batteries	16 06 02*	t	0.200	0,000	0,000	0,000	0,000	**0,200**	**0,740**	**0,000**	**0,940**	Nickel-cadmium batteries
23.	Tile and ceramics	17 01 03	t	0,000	0,000	0,000	0,000	0,000	**0,000**	**0,014**	**0.000**	**0,014**	Sanitary facilities
24.	Wood	17 02 01	t	0,000	0,000	0,000	0,000	0,000	**0,000**	**0,250**	**0,000**	**0,250**	Waste wood
25.	Plastics	17 02 03	t	0,000	0,000	0,000	0,000	0,000	**0,000**	**0,003**	**0,000**	**0,003**	Sanitary facilities
26.	Glass, plastic and wood containing hazardous substances or contaminated with hazardous substances	17 02 04*	t	6,830	0,000	0,000	0,000	0,000	**6,830**	**0,000**	**0,000**	**6,830**	Greased rubber-plastic seals and hydraulic hoses
27.	Copper, bronze, brass	17 04 01	t	0,420	0,000	0,000	0,000	0,000	**0,420**	**0,000**	**8,370**	**8,790**	Copper, copper strips, copper lacquer wire, insulated copper coils, scrap tin bronze, scrap aluminium bronze, bronze in one piece
28.	Iron and steel	17 04 05	t	31,500	59,000	0,000	0,000	0,000	**90,500**	**0,000**	**0,000**	**90,500**	Alloy steel (platform segments, crusher hammers, excavator teeth)
				44,000	0,000	0,000	0,000	0,000	**44,000**	**2,200**	**0,000**	**46,120**	Iron and steel with rubber coating, padded idlers
				35,000	52,470	0,000	0,000	0,000	**87,470**	**0,000**	**117,940**	**205,410**	Iron over 6mm (rails, construction parts, rolls and axles)
				44,200	18,740	0,000	16,800	0,000	**79,740**	**32,404**	**5,400**	**117,544**	Iron and steel over 3 mm (sheets, electrical switching cabinets. vulcanization container, sheet metal profiles, mixed category cabinets)
				158,500	9,620	15,860	0,000	0,000	**183,980**	**24,405**	**50,240**	**258,625**	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)
				0,000	0,000	0,000	0,000	0,000	**0,000**	**0,000**	**5,360**	**5,360**	Damaged parts, gears, axles, shafts
29.	Metal waste contaminated with hazardous substances	17 04 09*	t	1,040	0,000	0,000	0,000	0,000	**1,040**	**0,000**	**6,020**	**7,060**	Greased roller bearings
30.	Cables other than those indicated under 17 04 10	17 04 11	t	19,500	0,000	0,000	0,000	0,000	**19,500**	**0,300**	**7,400**	**27,200**	High voltage copper cables incl. insulation Low voltage copper cables incl. insulation Telephone cable
31.	Insulation materials containing asbestos	17 06 01*	t	0,000	0,000	0,000	0,000	0,000	**0,000**	**0,030**	**0,000**	**0,030**	Roof sheet -asbestos sheets- salonit
32.	Insulation materials other than those indicated under 17 06 01 и 17 06 03	17 06 04	t	0,000	0,000	0,000	0,000	0,000	**0,000**	**2,240**	**3,000**	**5,240**	Waste sandwich panels
33.	Saturated or exhausted ion exchange resins	19 09 05	t	0,000	0,000	0,000	0,000	0,000	**0,000**	**9,000**	**0,000**	**9,000**	Waste ion exchange resins
34.	Waste rubber strips	19 12 04	t	0,000	0,000	0,000	0,000	0,000	**0,000**	**1,000**	**36,000**	**37,000**	Rubber strips from scraped drum rubber coating
35.	Other wastes (including mixtures of materials) from mechanical treatment of waste containing hazardous substances	19 12 11*	t	0,000	0,000	0,000	0,000	0,000	**0,000**	**0,000**	**5,650**	**5,650**	Greased rubber-plastic seals
36.	Waste paper and cardboard	20 01 01	t	0,000	0,000	0,000	0,000	0,000	**0,000**	**2.480**	**1,100**	**3,580**	Paper and cardboard
37.	Fluorescent tubes and other waste containing mercury	20 01 21*	t	0,000	0,000	0,000	0,000	0,000	**0,000**	**0,131**	**0,120**	**0,251**	Fluorescent tubes
38.	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	1,441	0,000	0,280	0,000	**1,721**	**0,000**	**0,000**	**1,721**	Electro-hydraulic thrustors, electronic equipment, other

39.	Discarded electrical and electronic equipment other than those indicated under 20 01 21, 20 01 23 and 20 01 35	20 01 36	t	30,320	0,000	0,000	0,000	0,000	**30,320**	**0,431**	**0,000**	**30,751**	El.tools, devices and equipment (used electric machines and electric motors, tools, other)
40.	Plastics	20 01 39	t	0,000	0,570	0,000	0,000	0,000	**0,570**	**2,000**	**0,000**	**2,570**	Plastic rings, deck chairs, PET packaging

Table 34. provides the implementation of the sold amount of waste that Branch MB "Kolubara“ had in the period from 1st January – 31st December 2022.

Table 34

BRANCH MB KOLUBARA			
Sold amount of waste in 2022			
Item No.	**Waste name**	**Waste index number**	**Sold amount (kg)**
1.	Waste printer cartridges	08 03 18	1.600,000
2.	Scraping and processing of ferrous metals – pure waste shaving of ferrous metals without impurities	12 01 01	157.820,000
3.	Air filters	15 02 03	8.340,000
4.	Waste sandwich panels	15 02 03	2.660,000
5.	Incomplete scrapped construction mechanization	16 01 99/17 04 05	676.720,000
6.	Waste rubber conveyor belt with steel cord - on coils (wooden or metal); wrapped in a roll; unwound in pieces from 0.5 to 50 meters)	16 01 03	414.580,000
7.	Waste vehicles not containing liquids or other hazardous components	16 01 06	23.100,000
8.	Lead batteries (accumulators)	16 06 01*	12.780,00
9.	Iron and steel– Iron and steel with rubber coating (idlers and rollers)	17 04 05	72.660,000
10.	Iron and steel under 3 mm	17 04 05	76.560,000
11.	Iron and steel over 6 mm	17 04 05	136.660,000
12.	Lv, Hv cables also with cable insulation	17 04 11	19.400,000
13.	Waste rubber rings	19 12 04	23.560,000
14.	Waste rubber and matters of ferrous metals, rubber strips from scrapped drum rubber coating (with 5% ferrous metal scraping)	19 12 04	34.900,000
15.	Paper and cardboard	20 01 01	3.520,000
16.	Agreement on the purchase and sale of hazardous industrial waste, discarded electrical and electronic equipment other than that specified in 20 01 21 and 20 01 23 containing hazardous components (computers, printers, monitors, etc.)	20 01 35*	2.680,000
17.	Electrical and electronic equipment	20 01 36	9.380,000
18.	Waste plastics and plastic containers	20 01 39/15 01 02	920,000
19.	Waste plastics (plastic rings, deck chairs, barrels)	20 01 39	5.480,000
TOTAL: BRANCH MB KOLUBARA			**1.683.320,000**

Table 35 shows an overview of the realization of the disposed waste of Branch MB "Kolubara“ in the period from 1st January – 31st December 2022.

Table 35

BRANCH MB KOLUBARA			
Disposed waste in 2022			
Item No.	**Waste name**	**Waste index number**	**Takeover amount (kg)**
1.	Liquid waste from oil pit (emulsion)	13 05 07*	25.020,000
2.	Other emulsions - cleaning of existing washing points and sludge from washing points	13 08 02*	52.360,000
3.	Other emulsions - machine emulsions and solutions not containing halogens	13 08 02*	22.540,000
4.	Packaging containing residues of hazardous substances or contaminated with hazardous substances, oily empty waste barrels	15 01 10*	1.440,000
5.	Contaminated absorbents, oily wiping cloth, wipes and protective clothes	15 02 02*	2.100,000
6.	Waste wiping cloth, wipes, clothes	15 02 02*	4.040,000
7.	Oil filters	16 01 07*	10.900,000
8.	Nickel-cadmium batteries (NiCd)	16 06 02*	3.160,000
9.	Glass, plastic and wood containing hazardous substances or contaminated with hazardous substances, greased rubber-plastic seals	17 02 04*	20.500,000
10.	Metal waste contaminated with hazardous substances, greased roller bearings	17 04 09*	83.180,000

11.	Insulation materials containing asbestos, roof covers asbestos waste, asbestos board	17 06 01*	8.080,000
12.	Fluorescent tubes and other wastes containing mercury	20 01 21*	480,000
TOTAL: BRANCH MB KOLUBARA			**233.800,000**

1.3. Working Environment Monitoring, Occupational Health and Safety

The 2022 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

- **Noise Measurement in Working Environment**

Working environment noise levels measurement results are provided in Table 36.

Table 36

BRANCH MB KOLUBARA			
Noise in working environment for 2022			
Organizational Unit	**Plant**	**Registered noise level (dB(A))**	**Permitted noise level (dB(A))**
Open Pit Mines	/		
Processing Plant	In 2022 noise was measured in 302 points and it was within the limits of permitted values		85
Metal	/		
Headquarter	In 2022 noise was measured in 6 points within the limits of permitted values		85
Project	/		

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 2022, occupational health and safety training was performed for 2.863 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 10.602 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 37 shows the overview of the number of employees who have undergone the knowledge checks.

Table 37

BRANCH MB KOLUBARA			
Knowledge test in 2022			
Organizational Unit	**Invited**	**Tested**	**%**
Open Pit Mines	6.147	5.704	92,79
Processing Plant	1.550	1.500	96,77
Metal	1.850	1.814	98,05
Headquarter	1.576	1.512	95,94
Project	78	72	92,31
TOTAL: BRANCH MB KOLUBARA	**11.201**	**10.602**	**94,65**

- **Work injuries**

Table 38 provides the 2022 work injuries data.

Table 38

BRANCH MB KOLUBARA						
Work injuries in 2022						
Organizational Unit	**Number of employees**	**Injuries – employees ratio**				
		Minor	**Severe**	**Fatal**	**Total**	**%**
Open Pit Mines	6.373	105	31	1	137	2,15
Processing Plant	1.380	11	3	0	14	1,01
Metal	1.787	30	7	0	37	2,07
Headquarter	1.493	9	4	0	13	0,87
Project	84	1	0	0	1	1,19
TOTAL: BRANCH MB KOLUBARA	**11.117**	**156**	**45**	**1**	**202**	**1,82**

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 39 presents periodic examinations data for employees working in high-risk workplaces in 2022.

Table 39

BRANCH MB KOLUBARA											
Employees' work capability in 2022											
Organizational Unit	**Number of employees**	**Previous and periodical examinations**				**Work capability**					
		Referred to examination		**Examined**		**Capable**		**Limitted Capability**		**Incapable**	
		No.	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Open Cast Mines	6.373	5.996	94,08	5.511	91,91	3.721	67,52	1.614	29,29	176	3,19
Processing Plant	1.380	1.386	100,43	1.263	91,13	805	63,74	434	34,36	24	1,90
Metal	1.787	1.138	63,68	1.138	100,00	909	79,88	192	16,87	37	3,25
Headquarter	1.493	356	23,84	277	77,81	172	62,09	100	36,10	5	1,81
Project	84	8	9,52	8	100,00	2	25,00	6	75,00	0	0,00
TOTAL: BRANCH MB KOLUBARA	**11.117**	**8.884**	**79,91**	**8.197**	**92,27**	**5.609**	**68,43**	**2.346**	**28,62**	**242**	**2,95**

1.4. Public Submissions

Public Submissions for 2022 are shown in the Table 40.

Table 40

BRANCH MB KOLUBARA			
Public Submissions in 2022			
Organizational Unit	**Submissions (number, date and by whom submitted**	**Complaint subject**	**Measures taken**
Open Pit Mines	Decision of the republic inspector EP No. 2460500-E04.05-230002-22 as of 15.04.2023	Dust and noise	Measurements of noise and air quality conducted in the environment

Supervision was carried out by the republican environmental protection inspectors on March 17th 2022. The subject of the order was noise protection in the environment and air protection in the settlement of Baroševac, based on the submission of a natural person from Baroševac. By the decision number 2460500-E04.05-230002-22 dated 04.15.2023 air quality measurement and noise measurement in the environment were ordered, and accordingly, the procurement of "Unforeseen circumstances - inspection findings" was initiated. The measurements were conducted during October and the reports were submitted to the inspector on 31.11.2022.

2. BRANCH „THERMAL POWER PLANTS AND MINES KOSTOLAC“ - OCM

„TPPs & OCM Kostolac“ branch comprise the following organisational units:

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

2.1. Overview and status of Permits

During 2022, the status of existing permits, licenses and other required approvals did not change in Branch TPPs & OCM KOSTOLAC – Open-cut mines.

2.2. Monitoring and Environmental Impact

2.2.1. Air Quality Measurements

Air quality in the vicinity of open-cut mines and TPP "Kostolac" A and TPP "Kostolac" B is carried out within a unique network of measuring points

2.2.2. Emission Measurements of Matters Affecting Water Quality

- **Dewatering System Waters**

Water from the dewatering system of OCM "Drmno" are mostly drained into the cooling water sump of TPP "Kostolac B" and some smaller amounts into the Mlava river. Water from the drainage system of OCM "Cirikovac" is being accumulated nearby the open-cut mine. Water quantities for OCM "Klenovnik" are small and are not being measured.

The control of the quality of drainage water from the dewatering system of OCM "Drmno" in 2022 was carried out by the authorized legal entity "Institute for Occupational Safety" - Novi Sad. Table 41 shows the results of the drainage water quality from the OCM "Drmno" for 2022.

Table 41

Kostolac TPPs & OCMs Branch – OPEN-CUT MINES			
Drainage water quality in 2022			
OCM Drmno	**Drainage well 3 (inlet into pumping lake TPP B)**	**Drainage well 75 (North part OCM Drmno)**	**Overflow station - Mlava OCM Drmno**
Total non-organic nitrogen	0,448 – 1,759	6,32 – 9,47	3,7 – 8,55
Sulphates (mg/l)	54,7 – 177,9	5,63 – 12,64	56,71 – 97,4
Phenols (mg/l)	<0,006 – 0,024	<0,006 – 0,024	<0,006 – 0,024
Electrical conductivity (µS/cm)	416 – 1,168	465 – 712	760 – 966
Arsenic (mg/l)	<0,01	<0,01	<0,01

- **Sanitary water**

The water that is used for drinking and sanitary needs at OCM "Drmno" comes from the source of Bradarac. Drinking water quality control is carried out by the authorized legal entity Institute for Health Protection from Požarevac. The control of the quality of sanitary water from the drainage system of OCM "Drmno" in 2022 was carried out by the authorized laboratory "Institute for Occupational Safety" - Novi Sad.

Table 42 shows data about sanitary waste water treatment plant in 2022.

Table 42

TPPs & OCMs KOSTOLAC Branch –OPEN-CUT MINES	
Sanitary waste water treatment plant operation in 2022	
Pollutants concentration (mg/l)	**BIODISC OCM Drmno**
Suspended solids (mg/l)	
Plant inlet	6,0 – 58,33
Plant outlet	10,8 – 40,91
5-day biological oxygen demand (BOD_5)	
Plant inlet	11,4 – 40,2
Plant outlet	4,2 – 25,7
Operation efficiency evaluation	Meeting guaranteed values for suspended solids for all measurements

Table 43 shows data on the amount of water consumed for drinking and sanitary needs, as well as the amount of drainage water from OCM "Drmno" in 2022

Table 43

TPPs & OCMs KOSTOLAC Branch – OPEN-CUT MINES				
Water amounts in 2022 (m^3/year)				
Open-cut mine		**Dewatering**	**Sanitary water for the OCM needs**	
		Total amount of water	**Water lines**	**Total amount**
Klenovnik			14.558 m^3	14.558 m^3
Ćirikovac			4.461,5 m^3	4.461,5 m^3
Drmno	**Surface dewatering**	6.489.108,2 m^3	46.540 m^3	43.379.380,81 m^3
	Deep dewatering	36.843.732,61 m^3		
TOTAL: TPPs & OCM KOSTOLAC – OPEN-CUT MINES		**43.332.842,81 m^3**	**65.559,5 m^3**	**43.398.400,31 m^3**

2.2.3. Emission Measurements of Matters Affecting Soil Quality

Based on the Law of Soil Protection (OG RS № 112/2015) and Act on Systematic Monitoring of the Status and Quality of Soil (OG RS Nº. 88/2020) sampling of the soil at OCM "Drmno" has been performed by the Institute for occupational protection and enivornmental protection – Belgrade ltd.

Sampling has been executed on 29.12.2022. There were 10 samples taken at the following locations:

1. Workshop for heavy duty machinery maintenance – 2 samples have been taken;
2. 5th ECS system – 2 samples have been taken;
3. Fuel and grease storage – 2 samples have been taken;
4. Temporary storage for hazardous waste;
5. Transformer station "Rudnik 1“;
6. Transformer station "Rudnik 3“;
7. „Biodisc“.

Tables 44 and 45 show concentration of substances affecting the soil quality.

Table 44

TPPs & OCMs KOSTOLAC Branch – OPEN-CUT MINES								
Concentration of substances affecting the soil quality in 2022								
Sampling point	Chemical features							
	pH of the soil		Easy accessible		Total nitrogen content	Humus content	Anjon content	
	H_2O	KCl	P_2O_5 mg/100g	K_2O mg/100g	% N	%	NO_2^- mg/kg	NO_3^- mg/kg
Workshop for heavy-duty machinery maintenance 1/2	8,3	8,0	< 1	5,5	0,11	2,2	0,5	11,0
Workshop for heavy-duty machinery maintenance 2/2	9,2	8,0	< 1	6,3	0,09	1,7	0,5	7,4
5th ECS system 1/2	8,9	8,5	< 1	1,0	0,02	< 0,1	0,5	< 1
5th ECS system 2/2	8,9	8,7	< 1	1,1	0,03	< 0,1	< 0,5	< 1
Fuel and grease storage 1/2	8,4	8,0	< 1	3,7	0,08	1,5	< 0,5	22,5
Fuel and grease storage 2/2	8,4	7,8	< 1	4,6	0,10	2,0	< 0,5	41,6
Temporary storage of hazardous waste	8,4	7,8	< 1	5,8	0,11	2,2	< 0,5	14,3
Transformer station "Rudnik 1“	8,3	7,7	< 1	7,1	0,13	2,7	1,8	11,4
Transformer station "Rudnik 3“	8,4	7,7	< 1	4,7	0,11	2,7	< 0,5	54,9
"Biodisk“	8,9	8,0	< 1	7,6	0,13	2,6	< 0,5	13,4

Table 44

TPPs & OCMs KOSTOLAC Branch – OPEN-CUT MINES																				
Concentracton of substances affecting the soil quality in 2022																				
Sampling point	Heavy metal content																			
	Accesible form of heavy metals mg/kg										Total heavy metal content mg/kg									
	Cr	Ni	Pb	Cu	Zn	Cd	Hg	B	As	% Fe	Cr	Ni	Pb	Cu	Zn	Cd	Hg	B	As	%Fe
Workshop for heavy-duty machinery maintenance 1/2	< 0,25	< 0,4	< 2,5	< 0,1	0,2	< 0,4	< 0,1	< 0,1	< 0,1	29,9	43,9	24,6	< 8	23,5	40,4	0,5	0,5	< 0,1	6,5	1,1
Workshop for heavy-duty machinery maintenance 2/2	< 0,25	< 0,4	< 2,5	< 0,1	3,4	< 0,4	< 0,1	< 0,1	< 0,1	1,3	32,9	15	< 8	19,4	39,9	< 0,4	20,9	< 0,1	6,2	1,1
5th ECS system 1/2	< 0,25	< 0,4	< 2,5	< 0,1	3,5	< 0,4	< 0,1	< 0,1	1,4	< 0,1	19,6	8,9	< 8	< 6	16,3	< 0,4	0,4	< 0,1	< 2,1	0,4
5th ECS system 2/2	< 0,25	< 0,4	< 2,5	< 0,1	0,1	< 0,4	< 0,1	< 0,1	< 0,1	3,6	36,3	18,4	< 8	16,2	18,1	1,1	1,2	< 0,1	2,0	0,5
Fuel and grease storage 1/2	< 0,25	< 0,4	< 2,5	< 0,1	1,8	< 0,4	< 0,1	< 0,1	< 0,1	1,9	53,9	34,8	< 8	13,9	44,3	0,8	0,9	< 0,1	3,9	1,3
Fuel and grease storage 2/2	< 0,25	< 0,4	< 2,5	< 0,1	3,5	< 0,4	< 0,1	< 0,1	< 0,1	1,1	31,6	13,3	< 8	17,2	43,8	< 0,4	1,2	< 0,1	6,3	1,0
Temporary storage of hazardous waste	< 0,25	< 0,4	< 2,5	< 0,1	0,2	< 0,4	< 0,1	< 0,1	< 0,1	9,0	43,8	20,9	7	26,0	45,8	< 0,4	1,4	< 0,1	< 6,1	1,4
Transformer station "Rudnik 1“	< 0,25	< 0,4	< 2,5	< 0,1	3,5	< 0,4	< 0,1	< 0,1	< 0,1	0,2	35,6	16,2	< 8	17,8	43,1	< 0,4	0,4	< 0,1	6,0	1,3
Transformer station "Rudnik 3“	< 0,25	< 0,4	< 2,5	< 0,1	3,0	< 0,4	< 0,1	< 0,1	< 0,1	5,3	44,8	24,3	< 8	17,5	41,2	< 0,4	0,8	< 0,1	5,7	1,1
"Biodisk“	< 0,25	< 0,4	< 2,5	< 0,1	0,2	< 0,4	< 0,1	< 0,1	0,3	0,3	57,8	32,3	< 8	35,7	103,6	0,4	0,7	< 0,1	6,7	1,5

- **Overview of the expropriated and reclaimed area**

An overview of expropriated and reclaimed areas in PE EPS Branch TPPs and OCMs Kostolac, which includes the periods up to 2021, changes in 2022 and total area in 2022, by location and specified types of reclaimed area is given in Table 46.

The total expropriated area is 4,418.45 ha.

The land registered in the real estate cadastre amounts to a total of 482.96 ha.

The area of the land whose purpose was changed remained unchanged in reference to 2021 and amounts to a total of 454.32 ha.

The areas of land under construction remained unchanged compared to 2021 and amount to a total of 1.41 ha.

The area of land under the landfill remained unchanged in comparison to 2021 and amounts to a total of 859.20.

Reclaimed area include area under forest, arable land, orchard and nursery.

In 2022, the reclaimed area under the forest increased by 5.00 ha, and by the end of 2022, they amount to a total of 179.21 ha.

In 2022, the reclaimed area under arable land were increased by 15.00 ha, and by the end of 2022, they amount to a total of 367.80 ha.

Reclaimed area under orchards remained unchanged compared to 2021 and amounts to a total of 2.00 ha.

The reclaimed area under the nursery remained unchanged compared to 2021 and amounts to a total of 7.50 ha.

Table 46

TPPs & OCMs KOSTOLAC Branch – OPEN-CUT MINES																			
Overview of expropriated and reclaimed area up to 2022																			
OCM	**Expropriated area (ha)**	**Area of land registered in the cadastre (ha)**		**Area of land with changed purpose (ha)**		**Area of land under facilities (ha)**		**Area of land with lanadfill (ha)**				**Reclaimed area (ha)**							
								Internal		**Outer**		**Forests**		**Arable land**		**Orchards**		**Nursery**	
		Up to 2021	**In 2022**	**Up to 2021**	**In 2022**	**Up to 2021**	**in 2022**	**Up to 2021**	**in 2022**	**Up to 2021**	**in 2022**	**Up to 2021**	**in 2022**	**Up to 2021**	**in 2022**	**Up to 2021**	**in 2022**	**Up to 2021**	**in 2022**
Klenovnik	472,00	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	0,00	0,00	0,00
Cirikovac	1.047,00	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	0,00	0,00	0,00
Drmno	2.729,90	197,50	166,41	454,32	0,00	1,41	0,00	859,20	0,00	0,00	0,00	48,01	5,00	352,80	15,00	2,00	0,00	7,50	0,00
Klicevac	169,55	119,05	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	126,20	0,00	0,00	0,00	0,00	0,00	0,00	0,00
TOTAL	**4.418,45**	**482,96**		**454,32**		**1,41**		**859,20**		**0,00**		**179,21**		**367,80**		**2,00**		**7,50**	

2.2.4. Environmental Noise Measurements

The measurement of the noise level in the environment as part of regular monitoring for the winter and summer period was carried out in the vicinity of OCM "Drmno". The ultimate goal of the measurement is the determination of the relevant noise level, which is given through the measured equivalent levels and possible additions to the level depending on the type of observed noise.

Noise measurement has been executed in three intervals of 15 minutes for day and evening and two intervals of 15 minutes for night at three measuring points:

1. MMB – 1D – Measuring point in village Drmno on the West side of the mine nearby crushing plant (44°43'13.50"N и 21°13'24.47"E);
2. MMB – 2B – Measuring point nearby village Bradarac on the South side of the mine (44°41'50.55"N и 21°13'54.44"E);
3. MMB – 3K – Measuring point on the North-East side of the mine near village Klicevac (44°44'53.14"N и 21°16'53.43"E).

The measurement was carried out by the laboratory for the protection of the living and working environment "Mining Institute" ltd from Belgrade. The measurements were made on 28.03.2022 and 29.03.2022. Noise measurements were carried out in accordance with the Law on Environmental Noise Protection (OG of the RS No. 36/2009), the Law on Amendments to the Law on Environmental Noise Protection (OG of the RS No. 88/ 2010), Rulebook on noise measurement methods, content and scope of reports on noise measurement (Official Gazette of RS No. 72/10), Rulebook on conditions that must be met by an expert organization for noise measurement, as well as documentation submitted with the request for obtaining authorization for noise measurement (Official Gazette RS No. 72/10), Regulation on noise indicators, limit values, methods for evaluating noise indicators, disturbance and harmful effects of noise in the environment (Official Gazette RS.75 / 10)

Table 47 shows data of the measured noise level in the environment at the measuring point MMB – 1D.

Table 47

TPPs & OCMs KOSTOLAC Branch – OPEN-CUT MINES				
Noise level in 2022 (dB)(A) – Measuring point MMB-1D				
No. of measurement	**Reference time interval of the measuring (h)**	**Reference level $L_{Raeq,15min.}$ (63Hz – 8kHz)dB**	**Extended measuring uncertainty ±2u_L, (dB)**	**Limit value dB (A)***
1.	12^h (06^h – 18^h)	56,1	2,3	-
2.		48,8	2,3	
3.	4^h (18^h – 22^h)	64,1	2,4	
4.	8^h (22^h – 06^h)	58,7	3,5	-
5.		59,0	3,4	
For extended measuring uncertainty the possibility of spreading is almost 95%				

*there are no acoustic zones of the area.

During the measurement of noise in the environment, it was established that the noise level does not exceed the permitted level of external noise for day and night. Table 48 shows the data of the measured noise level in the environment at the measuring point MMB - 2B.

Table 48

TPPs & OCMs KOSTOLAC Branch – OPEN-CUT MINES				
Noise level in 2022 (dB)(A) – Measuring point MMB- 2B				
No. of measurement	**Reference time interval of the measuring (h)**	**Reference level $L_{Raeq,15min.}$ (63Hz – 8kHz)dB**	**Extended measuring uncertainty ±2u_L, (dB)**	**Limit value dB (A)***
1.	12^h (06^h – 18^h)	46,6	1,5	-
2.		41,6	2,3	
3.	4^h (18^h – 22^h)	45,2	2,4	
4.	8^h (22^h – 06^h)	49,7	2,8	-
5.		49,0	2,6	
For extended measuring uncertainty the possibility of spreading is almost 95%				

* there are no acoustic zones of the area.

Table 49 shows data of the measured environmental noise level at the working location MMB-3K.

Table 49

TPPs & OCMs KOSTOLAC Branch – OPEN-CUT MINES				
Noise level in 2022 (dB)(A) – measuring point MMB-3K				
No of measurment	**Reference time interval of the measuring (h)**	**Reference level $L_{Raeq,15min.}$ (63Hz – 8kHz)dB**	**Extended measuring uncertainty $\pm 2u_L$, (dB)**	**Limit value dB (A)***
1.	12^h (06^h – 18^h)	42,7	2,1	-
2.		40,9	2,2	
3.	4^h (18^h – 22^h)	47,9	2,3	
4.	8^h (22^h – 06^h)	49,4	2,8	-
5.		47,9	2,4	
For extended measuring uncertainty the possibility of spreading is almost 95%				

* there are no acoustic zones of the area.

Based on the nois measurments in communal area of the open-cut mine Drmno, at three measurment points, the following noise indicators have been obtained and shown in Table 50.

Table 50

TPPs & OCMs KOSTOLAC Branch – OPEN-CUT MINES				
Noise indicators in 2022 (dB) – open-cut mine Drmno district				
Name of the measuring point	**Measuring point**	**Reference level $L_{Raeq15min}$ (dB) day 12^h (06^h – 18^h)**	**Reference level $L_{Raeq15min}$ (dB) evening 4^h (18^h – 22^h)**	**Reference level $L_{Raeq15min}$ (dB) Night 8^h (22^h – 06^h)**
MMB – 1D	Measuring point at the west side of the OCM	56,1	64,1	58,7
		48,8		59,0
MMB – 2B	Measuring point at the south side of OCM	46,6	45,2	49,7
		41,6		49,0
MMB – 3K	Measuring point at the north-east side of OCM	42,7	47,9	49,4
		40,9		47,9

At the time of measurement and preparation of the report, there is no data on acoustic zoning next to the "Drmno" open-cut mine, and therefore no comparison with limit values and assessment of measurement results was made, because the local self-government department did not determine acoustic zones in the settlement.

If acoustic zoning is carried out in the meantime, the results listed in the report can be used for comparison with the limit values and an assessment of the measurement results can be given..

2.2.5. Waste

Table 51 shows the amount of waste generated in 2022 for the TPPs & OCMs KOSTOLAC Branch (from the OCM "Drmno" and "Ćirikovac" as parts of the Branch).

Table 51 shows the amount of waste generated in 2022 for the TPPs & OCMs KOSTOLAC Branch (from the OCM "Drmno" and "Ćirikovac" as parts of the Branch).

Table 51

TPPs & OCMs KOSTOLAC Branch – OPEN-CUT MINES						
Waste generated in 2022 (t)						
Редни	**Rulebook waste categories, its testing and classification (OG RS № 56/2010, 93/2019 and 39/2021)**		**Organizational unit**			**Note**
	Name	**Index number**	**OCM Drmno**	**OCM Cirikovac**	**Total**	
1.	Waste printer cartridges other than the ones indicated under 08 03 17	08 03 18 08 03 99	0,029	0,000	**0,029**	-
2.	Waste glue and gaskets containing organic solvents or other hazardous substances	08 04 09*	0,225	0,000	**0,225**	Glue
3.	Consumed wax and grease	12 01 12*	0,720	0,000	**0,720**	
4.	Waste mineral non-chlorinated hydraulic oil	13 01 10*	24,921	0,000	**24,921**	-
5.	Waste synthetic non-chlorinated hydraulic oil	13 01 11*	2,916	0,000	**2,916**	
6.	Mineral non-chlorinated motor oils, gearbox oils and lubricating oils	13 02 05*	21,700	0,000	**21,700**	-
7.	Other fuels (including mixtures)	13 07 03*	0,000	0,000	0,000	
8.	Other emulsions	13 08 02*	1,050	0,000	**1,050**	
9.	Packaging containing residues of hazardous substances or contaminated by hazardous substances	15 01 10*	0,000	0,000	0,000	Metal packing oil barrels
10.	Absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing, contaminated with hazardous substances	15 02 02*	1,460	0,000	**1,460**	Cotton
			0,100	0,000	**0,100**	Absorbent
11.	Absorbents, filter materials, wiping cloths, protective clothing different from those mentioned in 15 02 02	15 02 03	0,050	0,000	**0,050**	Air filter
			0,003	0,000	**0,003**	Protective means
12.	Waste tires	16 01 03	9,030	0,000	**9,030**	Car tires
13.	Waste vehicles which do not contain liquids or other dangerous components	16 01 06	0,000	0,000	**0,000**	-
14.	Oil filters	16 01 07*	2,100	0,000	**2,100**	-
15.	Brake lining containing asbestos	16 01 11*	0,18	0,000	**0,180**	
16.	Lead batteries	16 06 01*	6,986	0,000	**6,986**	Accumulators
17.	Ceramics	17 01 06*	0,000	0,000	**0,000**	-
18.	Glass	17 02 02	0,000	0,000	**0,000**	-
19.	Plastics	17 02 03	0,350	0,000	**0,350**	-
20.	Copper, brass, bronze	17 04 01	0,126	0,000	**0,126**	-
21.	Aluminium	17 04 02	0,050	0,000	**0,050**	-
22.	Iron and steel	17 04 05	723,166	0,050	**723,216**	Different thickness
23.	Cables different from those mentioned in 17 04 10	17 04 11	27,247	5,000	**32,247**	Copper cables
			0,005	0,000	**0,005**	Alluminium cables
24.	Soil and rock containing dangerous components	17 05 03* 15 02 02*	0,000	0,000	**0,000**	Soil and sand soaked with oil
25.	Plastic and rubber	19 12 04	0,000	0,000	**0,000**	Rubber belts

			3,608	0,000	**3,608**	Rubber materials
26.	Fluorescent tubes and other wate containing mercury	20 01 21*	0,114	0,000	**0,114**	Flue pipes and mercury bulbs
27.	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	0,000	**1,119**	-
28.	Discarded electrical and electronic equipment different from those mentioned in 20 01 21, 20 01 23 and 20 01 35	20 01 36	0,053	0,000	**0,053**	

Table 52

TPPs & OCMs KOSTOLAC Branch – OPEN-CUT MINES						
Waste delivered in 2022 (t)						
number	**Rulebook waste categories, its testing and classification (OG RS № 56/2010, 93/2019 and 39/2021)**		**Organizational unit**			**Note**
	Name	**Index number**	**OCM Drmno (t)**	**OCM Cirikovac (t)**	**Total (t)**	
1.	Waste mineral non-chlorinated hydraulic oil	13 01 10*	27,491	0,000	**27,491**	-
2.	Waste synthetic non-chlorinated hydraulic oil	13 01 11*	2,376	0,000	**2,376**	-
3.	Waste mineral non-chlorinated motor oils, gearbox oils and lubricating oils	13 02 05*	36,742	0,000	**36,742**	-
4.	Other fuels (including mixtures)	13 07 03*	4,885	0,000	**4,885**	-
5.	Waste vehicles which do not contain liquids or other dangerous components	16 01 06	158,350	0,000	**158,350**	-
6.	Lead batteries	16 06 01*	10,900	0,000	**10,900**	Accumulators

2.3. Working Environment Monitoring, Occupational Health and Safety

Occupational Safety and Health Reports for 2022 include the following elements:

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

2.3.1. Working Environment Monitoring

- **Working environment noise measurements**

In 2022 monitoring of the working environment was carried out at OCM Drmno and OCM Cirikovac, that is, noise measurements were carried out, namely:

- at OCM Drmno noise measurement was carried out at 88 workplaces. At one measuring point, the measured value of the equivalent sound pressure level exceeds the limits of the maximum permissible equivalent sound pressure level
- at OCM Ćirikovac, noise measurements were made at 5 workplaces. The measured values of the equivalent sound pressure level are within the permissible limits of the maximum permissible equivalent sound pressure level.

2.3.2. Occupational safety

- **Training of the employees**

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&OCMs Kostolac Branch and Occupational Health and Safety Act, in accordance with the Law on Mining and Geological Surveys and Law on Occupational Safety and Health at work. According to Occupational Health and Safety Act training within Kostolac TPP&OCMs 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.

Also, at OCM Drmno training course was performed for 237 employees who were engaged.

Table 53 shows a number of employees envisaged for training and number of employees who passed the training course 2022.

Table 53

TPPs & OCMs KOSTOLAC Branch – OPEN-CUT MINES					
Training of employees in 2022					
Organizational unit	**Number of employees**	**Forseen for training**		**Trained**	
		Број	**%**	**Број**	**%**
OCM Drmno	1.424	1.159	81,39	1.287	111,04
OCM Cirikovac	79	47	59,49	71	151,06
Headquarters	515	78	15,15	77	98,72
Total: TPPs & OCMs KOSTOLAC Branch – OPEN-CUT MINES	**2.018**	**1.284**	**63,63**	**1.435**	**111,76**

Note: Some workers went through more than one training, for example due to relocation to other jobs and similar.

- **Work injuries**

Table 54 shows data on number of injuires at work in 2022.

Table 54

TPPs & OCMs KOSTOLAC Branch – OPEN-CUT MINES						
Work injuries in 2022						
Organizational unit	**Number of employees**	**Injuries – Number of employees' ratio**				
		Light	**Serious**	**Fatalities**	**Total**	**%**
OCM Drmno	1.424	9	8	0	17	1,19
OCM Cirikovac	79	0	2	0	2	2,53
Headquarters	515	0	1	0	1	0,19
Total: TPPs & OCMs KOSTOLAC Branch – OPEN-CUT MINES	**2.018**	**9**	**11**	**0**	**20**	**0,99**

2.3.3. 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 2022 were performed at Occupational healthcare center Pozarevac.

Table 55 provides periodic examination data verifying the work capability of employees in 2022.

Table 55

TPPs & OCMs KOSTOLAC Branch – OPEN-CUT MINES											
Work capability in 2022											
Organizational unit	**Number of employess**	**Periodical examinations**				**Work capability**					
		Instructed to examination		**Examined**		**Capable**		**Limitted capability**		**Not capable**	
		број	**%**	**број**	**%**	**број**	**%**	**број**	**%**	**број**	**%**
OCM Drmno	1.424	1.159	81,39	1.154	99,57	1.024	88,73	112	9,71	18	1,56
OCM Cirikovac	79	47	59,49	46	97,87	28	60,87	10	21,74	8	17,39
Headquarters	515	78	15,15	77	98,72	72	93,51	5	6,49	0	0,00
Total: TPPs & OCMs KOSTOLAC Branch – OPEN-CUT MINES	**2.018**	**1.284**	**63,63**	**1.277**	**99,45**	**1.124**	**88,02**	**127**	**9,95**	**26**	**2,04**

2.4. Public submissions

There were no public submissions regarding environment in 2022.

3. NIKOLA TESLA THERMAL POWER PLANT BRANCH

Nikola Tesla TPP Branch (TENT Branch) is comprised 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 56 shows an overview of obtained permits, as well as submitted applications for new permits or extension of existing ones in 2022.

Table 56

NIKOLA TESLA THERMAL POWER PLANT BRANCH			
Overview and status of permits in 2022			
Organizational unit	**Obtained permits and approvals (number and date)**	**New requestes for obtaining or extension of valid permits**	**Note**
TENT A		Request for the Consent of the Ministry of Environmental Protection for the continuous measurement of emissions from stationary sources of pollution in the Nikola Tesla A and TENT B thermal power plants. Letter no. 2460500/E.03.01-199190/1-2022 from 01st April 2022.	It refers to the prescribed permit renewal. Two additions were subsequently submitted to the Ministry
	Decision on issuing a water permit no. 325-04-457/2022-07 from 22nd December 2021. A water permit was issued for the abstraction of surface water from the Sava River, abstraction of groundwater from 10 wells, storage of oil derivatives within the complex, as well as for a bank fortification with a wharf and unloading place on the right bank of the Sava. The validity period of the water permit is until 22nd June 2024.		
	Decision no. 353-02-02974/2021-03 from 28th March 2022 by the Ministry of Environmental Protection on approval of the Study on Environmental Impact Assessment of the project for flue gas desulphurization at TENT B.		
KOLUBARA A TPP		Request for consent to measure the emission of polluting substances into the air using a device for continuous measurement of emissions from stationary sources of pollution in JP EPS Branch TENT, location of TPP Kolubara, for two emission sources - for the joint plant of boilers K3, K4 and K5 and for the plant unit A5 (boiler K6), letter no. 2460500-E03.01.-481474/1-2022 from 27th July 2022.-	It refers to the prescribed permit renewal.

3.2. Monitoring and Environmental Impact

3.2.1. Air quality monitoring

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 2022, 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 Institut Vatrogas doo Novi Sad and Institute of Mining and Metallurgy from Bor.

TENT A and TENT B

In 2022 in the vicinity of TENT A and TENT B measurements of the total particulate matter content (TPM) were performed by the accredited laboratories at 18 measuring points, sulphur dioxide and soot concentrations were performed at two measuring points, and suspended matter smaller than 10μm (PM_{10}) 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. In order to assess the zero condition, PM_{10} and $PM_{2.5}$ measurements were performed at two measuring points, 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 PM_{10} at EMS Mladost, in accordance with legal regulations, were performed in a period of eight weeks, evenly distributed throughout the year. PM_{10} measurements in Rojkovac were performed throughout the year. Table 57 gives data on the air quality in the vicinity of TENT A and TENT B

During 2022 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. During 2022, TPM content was measured at 8 measuring points, and concentration of SO_2, soot and total suspended particles PM_{10} was measured at 1 measuring point. Measurements were performed in the period from 1st January 2022 until 31st December 2022.

Morava TPP

Air quality monitoring in the vicinity of Morava TPP started on 1st January 2022 by measuring the TPM content at 8 measuring points, and concentration of SO_2, soot and total suspended particles PM_{10} at 1 measuring point.

During 2022, 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 57 shows air quality data analysis for 2022 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 SO_2, TPM, total suspended matter PM_{10} 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 57

<table>
<tr><td colspan="6">NIKOLA TESLA THERMAL POWER PLANT BRANCH</td></tr>
<tr><td colspan="6">Air quality in 2022</td></tr>
<tr><td colspan="6">Legal compliance
(data or days exceeding legal limits)</td></tr>
<tr><td colspan="2" rowspan="2">Air quality indicators</td><td colspan="2">Total particulate matters levels - TPM (mg/m^2/day)</td><td colspan="2">Concentration of SO_2 (µg/m^3)</td></tr>
<tr><td>Maximum permissible value (MPV)</td><td>LV</td><td>TV</td><td>TL</td></tr>
<tr><td colspan="2">Averaging period</td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="2">One hour</td><td></td><td>350</td><td>350</td><td>0</td></tr>
<tr><td colspan="2">*One day</td><td></td><td>125</td><td colspan="2">-</td></tr>
<tr><td colspan="2">**One month</td><td>450</td><td colspan="3">-</td></tr>
<tr><td colspan="2">***Calendar year</td><td>200</td><td>50</td><td colspan="2">-</td></tr>
<tr><td rowspan="3">TENT A and TENT B</td><td>*</td><td>-</td><td colspan="3">No exceedance out of a total of 723 data. Measurements performed on two measuring points.</td></tr>
<tr><td>**</td><td>Measurings 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;
- 3 measuring points in Obrenovac and its vicinity;
-1 measuring point in Vladimirci.
Out of a total of 216 data items for monthly TPM values, there were no exceedances of MPV</td><td colspan="3">-</td></tr>
<tr><td>***</td><td>Out of a total of 18 metering points there were two exceedances of MPV for mean annual TPM value at TENT B.</td><td colspan="3">No exceedance</td></tr>
<tr><td rowspan="3">KOLUBARA A TPP</td><td>*</td><td>-</td><td colspan="3">Out of a total of 356 daily samples, the daily limit value was exceeded in 6 samples, ie. 1.7% of the total number of samples. There were two exceedances in January and one exceedance in March, April, August and September 2022. With the maximum measured concentration in January 2022 being 665.3 µg/m3
The measurement is performed at one measuring point</td></tr>
<tr><td>**</td><td>Measurements were performed at 8 measuring points from 01st January 2022 until 29th December 2022, therefrom:
At MM8 Veliki Crljeni, at crossroads for Sokolovo and Junkovac there were exceedances in January 2022 623.60 mg/m^2/day, in October 2022 505.30 mg/m^2/day and in December 2022 517.00 mg/m^2/day, at other measuring points there were no exceedances of MPV.</td><td colspan="3">No exceedance
The measurement is performed at one measuring point</td></tr>
<tr><td>***</td><td>For the measured period from 01st January 2022 until 29th December 2022, there were exceedances of the MPV at the measuring point MM8 Veliki Crljeni, at crossroads for Sokolovo and Junkovac (278.47 mg/m^2/day)</td><td colspan="3">More than 3 exceedances in one calendar year. At the measuring point Bazen Veliki Crljeni, there were 6 exceedances. The average annual concentration value in the period January-December 2022 was 34.4 µg/m3 and does not exceed the annual limit value.</td></tr>
<tr><td>MORAVA TPP</td><td>*</td><td>-</td><td colspan="3">2 times a year (in July and August).</td></tr>
</table>

	**	Measurings were performed at 8 measuring points, as follows: - 2 measuring points at TEM ash landfill; - 1 measuring point in the vicinity of coal landfill; - 4 measuring points in Svilajnac; - 1 measuring point in the village of Crkvenac; Single monthly concentrations of total TPM particulate matter in the period January - December 2022, at 8 measurement locations, ranged from 9.4 to 819.2 mg/m2 /day, with the maximum measured TPM concentration in April, at measuring site TEM-3 (819.2 mg/m2 /day).			No exceedance
	***	Out of a total of 95 monthly samples of total TPM, exceeding the monthly maximum allowed concentration (450 mg/m2 /day) was recorded at three measuring points: - TEM-2_UTM - Pumping station (556.3 mg/m 2 /day) - in April 2022; - TEM-3_UTM – Slag disposal (819.2 mg/m 2 /day) - in April 2022; - TEM-7_UTM - Garages (463.1 mg/m 2 /day) - in May 2022.			No exceedance
Air quality indicators		**Total suspended matters PM_{10} ($\mu g/m^3$)**			**Soot ($\mu g/m^3$)**
Averaging period		**LV**	**LV**	**LV**	**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 83 which is 20% out of 415 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).	-	-	Measurement were taken at two measuring points. There were 14 exceedances out of a total of 723 data items, out of which 13 at the measuring point in Rojkovac and one at the measuring point in Grabovac.
	**	-	-	-	-
	***	No exceedance of LV at measuring point Rojkovac and no exceedance at EMS Mladost	-	-	No exceedance
KOLUBARA A TPP	*	Number of data exceeding LV was 122 (in January 18, in February 15, in March 24, in October 17, in November 18 and in December 15), which is 35.57% (based on 343 data items). Measurement was performed daily at one measuring point on a daily basis.	-	-	Out of a total of 356 daily samples, the daily maximum allowed concentration was exceeded in 4 samples, i.e. 1.1% of the number of samples. The MPC exceedances were: in January 2022, two samples and one sample each in March 2022 and May 2022. With the maximum measured concentration in May 2022 of 77.4 µg/m3 The measurement is performed at one measuring point

		There were 35 exceedances in one calender year.			
	**				
	***	Above LV – 46.2 µg/m^3 (based on 343 data items, which is 93.97% data items for the subject year)	-	-	The average annual value of soot concentration in the period January-December 2022 was 10.7 µg/m3 and there is no exceedance of the annual MPC.
MORAVA TPP	*	Number of data exceeding LV was 59 (in January - 11, in February - 5, in March - 22, in June - 0, in July - 0, in August – 1, in September - 0, in October - 3, in November - 8, December - 5).	-	-	No exceedance
	**	-			-
	***	No exceedance			No exceedance
Air quality indicators		**Total suspended matters $PM_{2,5}$ (µg/m^3)**			
Averaging period		**LV**	**TV**		**TL**
***** Calendar year**		**25**	**25**		**0**
TENT A and TENT B	***	At both measurement sites, the mean annual concentration of PM2.5 was below the limit value. Average annual concentrations are: measurement site Rojkovac 20.64 µg/m3 and measurement site EMS Mladost 20.55 µg/m3			

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 $PM_{2,5}$ is of local significance, mainly the result of different sources of pollution (traffic, household furnces and the like). Pollution is higher during winter months.

3.2.2. Emission Measurements of Matters Affecting Air Quality

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 continuous measurements are carried out regularly, as well as periodic measurement to check the correctness of continuous measurements, and in Kolubara thermal power plant on boiler K1 periodic measurements were performed.

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

During 2022, periodic measurements of emissions of substances that affect air quality were carried out twice a year at stack 1 (boiler K1) of Kolubara A TPP, since this emitter is not obliged to continuously measure emissions into the air. Other plants within the TENT Branch perform continuous measurements of air emissions in accordance with the requirements of the Regulation on Measurements of Air Pollutant Emissions from Stationary Pollution Sources (Official Gazette of RS, No. 5/2016), and do not have the obligation to perform periodic measurements during regular plant operation.

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 58 shows the results of periodic emission measurements of air pollutants affecting air quality for the TENT Branch, performed during 2022.

Table 58

NIKOLA TESLA THERMAL POWER PLANT BRANCH								
Periodic emission measurements of matters affecting air quality in 2022								
Mass concentrations of matters affecting air quality (mg/Nm^3)								
Organizational part	**TENT A**						**TENT B**	
Unit	**A1**	**A2**	**A3**	**A4**	**A5**	**A6**	**Б1**	**Б2**
Power MWth	**660**	**660**	**932**	**943**	**934**	**934**	**1.809**	**1.826**
SO_2 -unit	-	-	-	-	-	-		
SO_2 -stack	-				-			
NO_x (NO_2) -unit			-		-	-		
NO_x (NO_2) -stack	-			-	-			
CO -unit		-	-	-	-	-		
CO- stack	-			-	-			
Particulate matter - unit					-	-		
Particulate matter - stack	-				-			
Organizational unit	**KOLUBARA A TPP**					**Morava TPP**		
Unit, boiler	**K1**			**K3,K4 and K5**		**A5,K6**		
Power MWth	**125,6**			-		-	-	
SO_2	4.238,5			-		-	-	
	6.407,6						-	
NO_x (NO_2)	296,7			-		-	-	
	270,0						-	
CO	32,6			-		-	-	
	74,0						-	
Particulate matter	959,8			-		-	-	
	968,4						-	

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 (O_2), carbon dioxide (CO_2) 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 (SO_2), nitrogen oxides (NO_x - NO_2), carbon monoxide (CO), carbon dioxide (CO_2), 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 59 shows the overview of results for continuous emission measurements of matters affecting air quality (mean annual mass concentration) for TENT Branch in 2022.

Table 59

NIKOLA TESLA THERMAL POWER PLANT BRANCH								
Continuous emission measurements of matters affecting air quality in 2022								
Mass concentrations of matters affecting air quality (mg/Nm^3)								
Organizational unit	**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	2.412			3.106			2.557	
NO_x (NO_2)	298			415			300	
CO	82			121			59	
Particulate matter	109			30			36	
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	-			6.258,8		3.756,2*		6.049
NO_x (NO_2)	-			202,6		312,0		367
CO	-			310,0		120,0		28
Particulate matter	-			**1.542,4**		**108,9****		34

Note:
On the basis of the Regulation on limit values of emission of pollutants into the air from combustion plants ("Official Gazette of the RS", no. 6/16, 67/21), Article 5 it is stipulated that old large combustion plants do not have to comply with individual GVEs if, from the date of entry into force of the said Regulation, they are included in the preliminary application for the National Plan for the reduction of emissions from stationary large combustion plants. TENT A and TENT B are included in the National Plan for the reduction of emissions.
Also in the same Regulation, Article 6 it is stated that old large combustion plants can be exempted by the competent authority from the application of limit values of emissions of polluting substances and obligations established by the National Plan for the Reduction of Emissions from Old Large Combustion Plants, provided that they are included in the exemption mechanism due to limited lifetime of the plant. MTPP and KTPP are covered by the exemption mechanism due to the limited lifetime of the plant.
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 plant 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 failure of the continuous measurement of SO_2 at unit A5, K6 of TPP Kolubara in August, September, November and December 2022, a correction was made to the average annual mass concentration of SO2 for 2022, by replacing the monthly values for August, September, November and December 2022. based on the periodic measurement from 2022.
** Due to the malfunction of continuous measurement of particulate matter on unit A5, K6 of TPP Kolubara in March, May and June 2022, the correction of the average annual mass concentration of particulate matter for 2022 was made by replacement of monthly values for March, May and June 2022 based on the periodic measurement from 2022. In March 2022, the device for measuring particulate matter was replaced, and then calibration was done according to the QAL-2 method.

Table 60 shows data on equipment in units for continuous emission measurement of matters affecting air quality in TENT Branch organizational units.

Table 60

<table>
<tr><td colspan="11">NIKOLA TESLA THERMAL POWER PLANT BRANCH</td></tr>
<tr><td colspan="11">Equipment in TPP units for continuous measurement of matters affecting air quality in 2022</td></tr>
<tr><td colspan="3">Emitted matter</td><td colspan="8">Parameters</td></tr>
<tr><td colspan="2" rowspan="2">Organizational unit</td><td rowspan="2">Particulate matter (PM)</td><td colspan="2">Gases</td><td colspan="3">Content</td><td rowspan="2">p</td><td rowspan="2">T</td><td rowspan="2">Flow</td></tr>
<tr><td>SO2, NOx(NO2), CO</td><td>HCl and HF</td><td>Humidity</td><td>CO2</td><td>O2</td></tr>
<tr><td rowspan="6">TENT</td><td>A1</td><td rowspan="3">Measuring devices installed on stacks of units A1A2A3.</td><td rowspan="3">One measuring device installed per unit and on the stack of units A1, A2, A3.</td><td rowspan="6"></td><td>Humidity measurement installed on stack of units A1, A2, A3 1 measuring device</td><td rowspan="6">Total: 4 measuring devices.</td><td colspan="4" rowspan="6">Devices installed on the stacks of the units A1, A2, A3 on flue ducts after the left and right ESP, behind flue gas fan, on units A4, A5 and A6
A total of 6 devices each for pressure, temperature and flow and 4 for oxygen O2</td></tr>
<tr><td>A2</td></tr>
<tr><td>A3</td></tr>
<tr><td>A4</td><td rowspan="3">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:
6 devices.</td><td rowspan="3">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 3 sets of measuring devices.</td><td rowspan="3">Humidity adopted for units A4, A5 and A6.</td></tr>
<tr><td>A5</td></tr>
<tr><td>A6</td></tr>
<tr><td rowspan="3">TENT B</td><td rowspan="2">B1</td><td colspan="2">Measuring device installed on the flue duct, at the elevation 55.1 m in the inner stack lining.</td><td>-</td><td colspan="5">Measuring device installed on the flue duct, at the level 55.1m in the inner stack lining.</td></tr>
<tr><td colspan="9">Platform located at the elevation 54m, inner stack lining
Total: 1 set of measuring devices</td></tr>
<tr><td rowspan="2">B2</td><td colspan="2">Measuring device installed on the flue duct, at the elevation 55.1 m in the inner stack lining.</td><td></td><td colspan="5">Measuring device installed on the flue duct, at the level 55.1m in the inner stack lining.</td></tr>
<tr><td colspan="9">Platform located at the elevation 54m, inner stack lining
Total: 1 set of measuring devices</td></tr>
<tr><td rowspan="5">KOLUBARA A TPP</td><td>K1</td><td colspan="2">-</td><td>-</td><td colspan="5">-</td></tr>
<tr><td>K3</td><td colspan="9" rowspan="3">Measuring devices (except HC and HF devices) installed at the elevation of 46.25m, outer stack lining.
Platform is located at the elevation of 45m, outer stack lining. Control measurements openings at the elevation of 46.75m. Stack height - 105m.</td></tr>
<tr><td>K4</td></tr>
<tr><td>K5</td></tr>
<tr><td>A5-K6</td><td rowspan="2">Installed
• behind ESP after FGF:
Left ESP
Right ESP
• stack</td><td>Installed on the stack</td><td>-</td><td colspan="2">Installed on the stack</td><td>Installed
• behind ESP after FGF:
Left ESP
Right ESP
• stack</td><td>Installed on the stack</td></tr>
<tr><td colspan="8">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.</td></tr>
<tr><td colspan="2">MORAVA TPP</td><td colspan="9">At the measuring section of the stack thee 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.</td></tr>
</table>

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: SO_2, NOx, 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".

On 27th July 2022 a Request for Consent was sent for the measurement of pollutant emissions into the air using a device for continuous measurement of emissions from stationary sources of pollution in JP EPS Branch TENT, location of TE Kolubara, for two emission sources - for the joint plant of boilers K3, K4 and K5 and for the plant unit A5 (boiler K6), letter no. 2460500-E03.01.-481474/1-2022. No answer received.

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. The device for measuring particulate matter was replaced, and then calibration was performed according to the QAL-2 method in March 2022. After the completion of the overhaul, the unit was started and remained online until the end of the year and beyond. There were short interruptions due to breakdowns, so continuous measurements of pollutant emissions into the air were in operation during the entire operation of the unit. The measurements were occasionally interrupted due to technical problems, of which the competent authorities were promptly informed.

Annual emissions of matters affecting air quality

Table 61 provides an overview of air emissions affecting the air quality: dust, SO_2, NO_2 and CO_2 for TENT Branch in 2022. The values of mass concentrations and volume flow of pollutants were obtained by continuous measurements of emissions in the period from 01st January until 31st December 2022. 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 (Nm^3) obtained from occasional measurements of pollutant emissions in 2022.

Table 61

NIKOLA TESLA THERMAL POWER PLANT BRANCH				
Emissions of matters affecting air quality in 2022 (t/year)				
Organizational unit	**Particulate matter**	**SO_2**	**NO_x (NO_2)**	**CO_2**
TPP NIKOLA TESLA A				
A1-A2-A3	1.738,18	38.463,13	4.752,08	3.825.253,70
A4-A5-A6	663,08	68.650,72	9.172,58	6.029.538,82
Total: TENT A	**2.401,26**	**107.113,85**	**13.924,66**	**9.854.792,52**
TPP NIKOLA TESLA B				
Total: TENT B	**1.020,22**	**73.019,53**	**8.502,57**	**7.629.658,34**
Kolubara A TPP				
K1	588,52	3.261,79	172,80	130.225
K3, K4 and K5	564,75	2.291,70	74,18	113.199

A5, K6	164,09	5.659,85	470,12	309.580
Total: KOLUBARA A TPP	**1.317,36**	**11.213,34**	**717,10**	**553.004**
Morava TPP				
Total: MORAVA TPP	**124,8**	**33.183,4**	**1.580,3**	**711.721**
TOTAL: NIKOLA TESLA THERMAL POWER PLANT BRANCH	**4.863,36**	**224.530,12**	**24.724,63**	**18.794.175,86**

Calculation for CO_2 was made on the basis of data on fuel consumption, shown in Table 62 and CEF - emission correction factor.

Table 62

NIKOLA TESLA THERMAL POWER PLANT BRANCH								
Fuel consumption in 2022								
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	944.739	B1	5.716.847	K1	189.124	850.864	**26.728.027**
	A2	1.795.187	B2	5.183.458	K2	-		
	A3	2.850.187			K3	51.909		
	A4	3.078.664			K4	58.896		
	A5	2.625.542			K5	52.340		
	A6	2.862.504			K6	467.766		
	TOTAL	**14.156.823**		**10.900.305**		**820.035**	**850.864**	
HEAVY FUEL OIL	A1	8.381	B1	18.689	K1	-	2.893	**98.998**
	A2	7.792	B2	28.795	K2	-		
	A3	8.951			K3	-		
	A4	7.047			K4	-		
	A5	8.310			K5	-		
	A6	8.140			K6	-		
	TOTAL	**48.621**		**47.484**		-	**2.893**	
OIL	A1	-	B1	-	K1	2.065	336	**8.330**
	A2	-	B2	-	K2	-		
	A3	-			K3	911		
	A4	-			K4	477		
	A5	-			K5	632		
	A6	-			K6	3.909		
	TOTAL	-		-		**7.994**	**336**	

- **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 ≤ 50mg/Nm^3, which is in accordance with the requirements from the Regulation on limit values of emissions of pollutants into the air from combustion plants ("Official Gazette of RS", No. 6 of 28th January 2016, 67 of 2nd July 2021).

Electrostatic precipitator of Morava TPP was reconstructed in order to achieve the output dust concentration of 50 mg/Nm^3, during the 2016 overhaul. Individual measurements of matters affecting air quality carried out in May and October 2022 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 because at that time there were no prescribed limit values of emissions (GVE). To reduce sulphur oxide emissions below 200mg/Nm^3 in line with the Directive on

industrial emissions of the European Union, flue gas desulphurization plants should be introduced in the forthcoming period in TPP "TENT A" units A3-A6 and in TPP „TENT B" units B1-B2.

In 2011, the Japanese Government approved a loan to introduce the flue gas desulphurisation system at the Nikola Tesla A TPP. After receiving the approval of the Ministry of Environmental Protection for the Environmental Impact Assessment Study of the project for construction a flue gas desulphurization plant of units A3-A6 at the location of the "Nikola Tesla A" TPP in 2019, construction permits were obtained.

During 2022, work continued on both phases of the construction of the flue gas desulphurization plant. At the end of 2022, the realization of completed works is 91.17%.

The construction project of the flue gas desulfurization plant of units B1-B2 at the "Nikola Tesla B" TPP location is divided into 4 phases. The consent of the Ministry of Environmental Protection (No. 353-02-02974/2021-03 dated 28th March 2022) was obtained for the Environmental Impact Assessment Study of the flue gas desulfurization project in TENT B

With the construction of a flue gas desulphurization plant, it is expected that the concentration of sulfur dioxide from both units will decrease to the level of 130 milligrams per cubic meter. In the first phase, works are being carried out on the construction of the limestone and gypsum system, the second phase consists of the construction of the absorber and stack system, the third phase includes the construction of flue gas ducts and the installation of booster fans, and in the fourth phase, bridges will be built to carry pipelines and electrical cables.

At the end of 2022, the realization of completed works is 19.91%

Nitrogen oxides

In the previous period, primary measures have been introduced on units A3, A4 and A5 TENT A and on unit B1 TENT B in order to reduce the emission of nitrogen oxides below 200 mg/Nm3. The guarantee tests of Low NOx burners on unit B1 were 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 unit B2 at TENT B.

3.2.3. 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 ash and slag transport in TENT A, while 0.7% of captured water was used in 2022 in TENT B for ash and slag transport and wetting of the landfill.

Wastewater originating from the ash and slag hydraulic 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 collected in overflow basins and then 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 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 which are 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 in purification devices (TENT A and TENT B) is discharged directly or indirectly into the river. The equipment for sanitary wastewater treatment Biodisk, in TENT A has an UV lamp for water desinfection 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 waste landfill after passing the oil 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 which is analyzed once a month.

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 – recepients' 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 at TENT A and Putoks at TENT B. 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 storages for temporary waste disposal in TENT A and TENT B.

TENT B recorded the current state, so-called "zero state", of groundwater quality prior to the comencement 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.

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 2022 at all four locations of TENT was executed by authorized legal entity, the Institute for occupational protection Novi Sad in the first quarter of the year and Anahem doo. For the rest of the year. Table 63 shows the analysis of wastewater and recipient quality data for 2022 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 63

NIKOLA TESLA TPPs BRANCH				
Water quality in 2022				
Organizational unit	**TENT A**	**TENT B**	**KOLUBARA A TPP**	**MORAVA TPP**
Water type	**Waste water and recipients**			
Drainage wastewater from the landfill	▪ suspended solids: <1 – 72 mg/l, one LV exceedance - 35 mg/l in old drainage channel ▪ arsenic: <0,004 - 27 µg/l, three LV exceedances each 10µg/l in samples of new and old drainage channel ▪ sulphates: 114 - 624 mg/l, below LV-2.000 mg/l ▪fluorides: <0,5 -1,95 mg/l, without LV exceedance-2mg/l	▪ Water from the perimeter channel around the ash landfill - a mixture of overflow and drainage waters: ▪ suspended solids. 20 – 114 mg/l, ▪ arsenic: 32 - 78 µg/l, ▪ sulphates: 461-832 mg/l ▪ fluorides: <0,5 -2,6 mg/l Note: these waters are not discharged into the recipient, so compliance with the limit values is not given	-	Not discharged into recipient.
Overflow wastewater from the landfill	▪ suspended solids: 8 – 18 mg/l, without LV exceedance ▪arsenic: 78 – 350 µg/l. Above LV-10µg/l ▪sulphates: 380 – 622 mg/l, below LV-2.000mg/l ▪fluorides: <0,5 - 3,53mg/l, LV exceedance-2mg/l in one sample **Note:** analysed sample is a mixture of overflow and drainage waters with mostly overflow waters	Water from the perimeter channel around the ash landfill - a mixture of overflow and drainage waters: ▪ suspended solids. 20 – 114 mg/l, ▪ arsenic: 32 - 78 µg/l, ▪ sulphates: 461-832 mg/l ▪ fluorides: <0,5 -2,6 mg/l Note: these waters are not discharged into the recipient, so compliance with the	**Suspended solids:** 4-14 mg/l, in all four series below reference value, RV: 35 mg/l; **arsenic:** 0.181-1.4 mg/l, in all four sample series above reference value: 0.01 mg/l; **sulphates:** 385-638 mg/l, in all four series below reference value 2000 mg/l; **fluorides**: <0.1-<0.5 mg/l, in all four series below	Not discharged into recipient.

NIKOLA TESLA TPPs BRANCH				
Water quality in 2022				
Organizational unit	**TENT A**	**TENT B**	**KOLUBARA A TPP**	**MORAVA TPP**
Water type	**Waste water and recipients**			
		limit values is not given	reference value, RV: for fluorides 2 mg/l;	
Recipient	No changes of the Sava River quality upstream - downstream of TENT A for: ▪arsenic: not exceeding LV-10µg/l ▪sulphates: up to 116 mg/l, one LV exceedance-100 mg/l ▪ mineral oil: not identified. Sava River temperature differences (TENT A upstream and downstream) is more than 3°C (legal regulation) in one sample and amounts to 3,4°C, the difference averages 2,3°C. In the second quarter, the Sava downstream from TENT A was the third class for the suspended solid parameter, compared to the Sava upstream.	There are no changes in the quality of the Sava river upstream - downstream from TENT B for: ▪ arsenic: not exceeding LV -10µg/l ▪ sulphates: up to 61 mg/l, below LV-100 mg/l ▪ 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 0,5°C	**Turija River:** -**arsenic**: upstream values are below the LV: 0.010 mg/l (in batches I,III and IV, whereas in II batch it was above LV: 0.013 mg/l, downstream are three samples (II, III and IV batch) above LV: 0.010 mg/l, and in the I batch is below LV. ▪**sulphates**: upstream values are below the reference value in all four sampling batches LV: 100 mg/l, Two samples downstream (II and III batches of sampling) are above the reference value of 100 mg/l; **Kolubara River**: -**arsenic**: upstream values are below the reference value 0.010 mg/l, in all four samples. - downstream two samples (III and IV batch) above LV: 0,010 mg/l; -**sulphates:** upstream all samples are below limit value: 100 mg/l, downstream in three batch samples below LV. In the III sampling batch values above LV. - **Mineral oils**: upstream and downstream I,II and III batch <0.01mg/l, - <1.0mg/l, in IV sampling batch upstream 0.and downstream 0.03 mg/l, LV are not given. - Kolubara River temperature difference upstream	**Velika Morava River upstream wastewater discharge:** Total N 2,66 mg/l (I quarter) Ammonium ion 0,778 mgN/l (I quarter) Oxygen saturation 61-123,4% (I, II, III and IV quarter) Nitrites 0,05-0,56 mgN/l (II and III quarter) Phosphates 0,11 mgP/l (II quarter) Manganese 0,12-0,14 mg/l (II and III quarter) **Velika Morava River downstream wastewater discharge:** Total N 2,33 mg/l (I quarter) Ammonium 0,06-0,27mg/l (II and IV quarter) Ammonium ion 0,495 mgN/l (I quarter) Oxygen saturation 57-107,5 % (I, II, III and IV quarter) $БПК_5$ 6 mg/l (II quarter) Phosphates 0,13 mgP/l (II quarter) Iron 0,67 mg/l (III quarter) Manganese 0,13 mg/l (IV quarter) **Velika Morava River during discharge of wastewater from sand filters washing:** Suspended solids 66 mg/l (IV quarter) Dissolved oxygen 3,5-6,2 mg/l (II, III and IV quarter) Oxygen saturation 42,7-121,2 % (I, II, III and IV quarter) Total N 2,65 mg/l (I quarter) Ammonium 0,84 mgN/l (I quarter) Nitrites 0,44 mg/l (II quarter) Phosphates 0,12-0,13 mgP/l (II and III quarter)

NIKOLA TESLA TPPs BRANCH				
Water quality in 2022				
Organizational unit	**TENT A**	**TENT B**	**KOLUBARA A TPP**	**MORAVA TPP**
Water type	**Waste water and recipients**			
			and downstream from TEK is lower than 3°C in all four batches of sampling.	Iron 1,6 mg/l (III quarter) Manganese 0,12-0,28 mg/l (II, III and IV quarter) **Return cooling water at discharge of the Velika Morava River:** Suspended solids 62 mg/l (IV quarter)

Table 64 shows the analysis of groundwater quality data in the vicinity of ash and slag landfills for 2022 in terms of compliance with legal requirements. The analysis is given for some of the examined parameters that are of greater importance.

During 2022 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 (in the fourth batch of sampling, the village well marked N2 (Kovač) northwest of the landfill was not sampled, because it is located on the newly formed surface intended for the construction of the "C" cassette) and TPP Morava 1 piezometer and 2 rural wells and 2 technical water 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 64

NIKOLA TESLA TPPs BRANCH						
Groundwater quality around ash and slag landfills in 2022						
	Permissible values		**Organisational unit**			
	*	**	**TENT A**	**TENT B**	**KOLUBARA TPP A**	**MORAVA TPP**
Sulphates (mg/l)	250		Highest in piezometers: Pp7, P15/2 and P4/2 (from 398 mg/l – 1407 mg/l). Below MPC in all samples of rural wells.	Highest in piezemeters: P2 and P48: 498 mg/l - 782 mg/l. Below MPC in all samples of rural wells.	**In wells:** ▪ N1 and N3 below MPC ▪ N2, 604-683.1 mg/l, in all three batches of sampling MPC 250 mg/l; in IV batch of sampling not sampled. ▪ N4, 324.1-600 mg/l, in I, II and IV batches of sampling above MPC. In III batch of sampling below MPC. **In piezometers:** ▪ I-2, 253-526mg/l; ▪ VIII-1, 391-763 mg/l, ▪ XV-1, 237-569 mg/l, ▪ B2, 197-546 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 256-410,8 mg/l In rural well Crkvenac 78-262mg/l Hand pump at the hunting lodge 291-456 mg/l In the hydrant water well 287,9-571 mg/l In well Topoljar 206,6-294 mg/l
Arsenic (µg/l)	10	60	Above MPC in three piezometer samples P15/2 (0,077; 0,086 and 0,063 mg/l) and four piezometer samples P7/3 (0,148; 0,20; 0,11 and 0,079 mg/l). Below MPC in all samples of rural wells.	Below MPC in all piezometers. Below MPC in all samples of rural wells.	**In wells:** ▪ N1, N2, N3 and N4 below MPC 0.010 mg/l, in all sampling batches. **In piezometers:** ▪ I-2, 0.996-16 mg/l, in all samples above MPC 0.060 mg/l; ▪VIII-1, 0.32-0.164 mg/l, in all samples above MPC МДК 0.060 mg/l; ▪XV-1, 0.050-0.054 mg/l, y I and IV below MPC; 0.22-0.37 mg/l in II and III batch above MPC 0.060 mg/l; ▪B2, 0.013- 0.050 mg/l, in all samples below MPC 0.060 mg/l;	In controlled piezometer <0,01-0,013 mg/l In the rural well Crkvenac <0,01 mg/l Hand pump at the hunting lodge <0,01-0,013 mg/l In the well for hydrant water <0,01-0,013 mg/l In the well Topoljar 0,0073-0,01 mg/l

NIKOLA TESLA TPPs BRANCH						
Groundwater quality around ash and slag landfills in 2022						
	Permissible values		**Organisational unit**			
	*	**	**TENT A**	**TENT B**	**KOLUBARA TPP A**	**MORAVA TPP**
Lead and cadmium (mg/l)	Pb 0,01	Pb 0,075 Cd 0,006	Lead above MPC in two piezometer samples P7a (0,420 и 0,11 mg/l), in one piezometer sample P7/3 (0,099 mg/l), one piezometer sample P4/2 (0,36 mg/l), two piezometer samples P1/4 (0,408 and 0,81 mg/l), three piezometer samples P19 (0,2; 0,436 and 0,55 mg/l) and one sample P21 (0,20 mg/l) and P30 (0,087 mg/l) each. Cadmium above MPC in three piezometer samples P19 (0,031; 0,041 and 0,025 mg/l) and in two piezometer samples P21 (0,01 and 0,023 mg/l), P1/4 (0,015 and 0,024 mg/l) and P7a (0,017 and 0,009 mg/l). Lead below MPC in all rural well samples.	Lead above MPC in one piezometer sample Ps1 (0,1 mg/l) in one piezometer sample Ps2 (0,99 mg/l) Cadmium above MPC in one piezometer sample P74 (0,0079 mg/l) and one piezometer sample P32 (0,02 mg/l) Lead below MPC in all rural wells.	**In wells**: N1, N2, N3 и N4 Pb below reference value 0.01 mg/l, in all samples. In piezometers Cd below reference value 0.006 mg/l, in all samples except in piezometer VIII-1 in III and IV batch 0,013-0,009 mg/l, above reference value 0.006 mg/l; **Pb in piezometers:** ▪I-2, in I batch: 0.025 mg/l, below LV. In batches: II-0.53 mg/l, III- 8.5 mg/l and IV- 0.11 mg/l above reference value 0.075 mg/l; ▪VIII-1, 0.011-0.067 mg/l, in I,II and IV batch of samples below reference value 0.075 mg/l and in III batch 0.28 mg/l above reference value 0.075 mg/l; ▪XV-1, < 0.011– 0.073 mg/l, below RV 0.075 mg/l; ▪B2, 0.013-0.035 mg/l in all four samples, below RV.	In controlled piezometer <0,01 mg/l Pb < 0,001 mg/l Cd In the rural well Crkvenac <0,01 mg/l Pb Hand pump at the hunting lodge <0,001 mg/l Pb In the well for hydrant water <0,01 mg/l Pb < 0,001 mg/l Cd In the well Topoljar <0,01 mg/l Pb < 0,001 mg/l Cd
Zinc (mg/l)	3,0	0,8	Above MPC in most samples of piezometers (up to 102 mg/l). Below MPC in all samples of rural wells.	Above MPC in some samples of piezometers P59, P74, Ps2 and P32 (1,1 – 6,3 mg/l) Below MPC in all samples of rural wells.	**In wells:** Zn below reference value 3.0 mg/,l in all samples. **In piezometers:** Zn is below reference value 0.8 mg/l, in all samples of piezometers XV-1 and B2, whereas in piezometer I-2 in II-0.013 mg/l, III-0.32 mg/l, and IV-0.21 mg/l, and piezometer VIII-1 in I and II batches of samples 1.78 mg/l, and 2.0 mg/l, above reference value 0.8 mg/l;	In controlled piezometer 0,035-0,054 mg/l In the rural well Crkvenac 0,061-0,87 mg/l Hand pump at the hunting lodge 0,062-0,19 mg/l In the well for hydrant water <0,03-0,039 mg/l In the well Topoljar <0,03-0,042 mg/l.

NIKOLA TESLA TPPs BRANCH						
Groundwater quality around ash and slag landfills in 2022						
	Permissible values		**Organisational unit**			
	*	**	**TENT A**	**TENT B**	**KOLUBARA TPP A**	**MORAVA TPP**
Manganese (mg/l)	0,05		Above MPC in three samples of rural well Krtinska 1: 0,29; 1,1 and 0,661 mg/l and in one sample of rural well Krtinska 2: 0,098 mg/l.	Above MPC in one sample of well 2 in Grabovac (0,11 mg/l)	**In wells:** N1 – in II- 0.23 mg/l, in III- 0.35 mg/l, and in IV- 0.11mg/l, above reference value 0.05 mg/l. In I batch below RV. N2 – in I- 1.35 mg/l, in II- 3.3 mg/l, and in III batch – 0.64 mg/l, above reference value. IV batch was not sampled. N3 – in II-0.40mg/l, in III- 0.074 and in IV-0.14 mg/l, above reference value. In I batch below RV. N4 – below reference value in I,III and IV batch. In II batch - 0.081 mg/l, above RV.	In controlled piezometer 0,123-0,18 mg/l In the rural well Crkvenac 0,007-0,012 mg/l Hand pump at the hunting lodge 0,078-1,3 mg/l In the well for hydrant water <0,01-0,016 mg/l In the well Topoljar 0,68-1,3 mg/l.
Ammonia (mg/l)	0,5		Ammonia is below MPC in all samples of rural wells.	Ammonia is below MPC in all samples of rural wells.	Ammonia below reference value 0.5 mg/l, y in well N1 whereas in well N2 in II and III batch of sampling above reference value (3.4 mg/l ,1.4 mg/l,) IV batch not sampled. In well N3 in II batches of sampling above reference value 2.8 mg/l, and in well N4 in II and III batches of sampling above reference value (5.6 mg/l, 2.1 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 the rural well Crkvenac <0,01-0,27 mg/l Hand pump at the hunting lodge <0,01-0,18 mg/l
Nitrites (mg/l)	0,1		Nitrites above MPC registered in two samples of well 1 in Krtinska – 1,0,48 and 0,24 mg/l.	Nitrites are below MPC in all rural well samples.	Nitrites are below MPC 0.03 mg/l in all samples of wells N1, N2, N3 and N4, Nitrites were not tested for piezometers.	In the rural well Crkvenac <0,03-0,088 mg/l Hand pump at the hunting lodge <0,03-0,06 mg/l

NIKOLA TESLA TPPs BRANCH						
Groundwater quality around ash and slag landfills in 2022						
	Permissible values		**Organisational unit**			
	*	**	**TENT A**	**TENT B**	**KOLUBARA TPP A**	**MORAVA TPP**
Nitrates (mg/l)	50		Nitrates above MPC registered in one sample of well in Urovci – 104,4 mg/l.	Above MPC in one sample of well 1 in Grabovac (59,83 mg/l) and one sample of well in Usce (81,65 mg/l).	**In wells:** ▪ N1 and N3 below MPC ▪ N2, 604-683.1 mg/l, in all three batches of sampling MPC 250 mg/l; In IV batch of sampling sample is not taken. ▪ N4, 324.1-600 mg/l, in I, II and IV samples above MPC. In III batch below MPC. **In piezometers:** ▪ I-2, 253-526mg/l; ▪ VIII-1, 391-763 mg/l, ▪ XV-1, 237-569 mg/l, ▪ B2, 197-546 mg/l, 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 0,11-2,48 mg/l In the rural well Crkvenac 0,94-34,75 mg/l Hand pump at the hunting lodge 0,2-0,87 mg/l In the well for hydrant water 0,39-1,7 mg/l In the well Topoljar 0,1-1,2 mg/l.

*MPC potable water;
** Remediation values of concentration of hazardous and harmful substances and values indicating serious groundwater contamination.

Of the other exceedances of MPC in piezometers, an elevated concentration of copper in one sample of piezometer P7/3 and one sample of piezometer P4/2, of tin in one sample of P7/3, as well as mineral oil in one sample of piezometer P21 was registered at the TENT A location.

For the village well samples at the TENT A and TENT B locations, apart from the parameters listed in the table, the other exceedances refer mainly to the parameters oxygen saturation, iron, turbidity, as well as microbiological defects.

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 (agriculture) are increased as well as microbiological defects 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 65 provides the analysis of sanitary wastewater quality data at the treatment plant inlet and outlet for 2022.

Table 65

NIKOLA TESLA TPPs BRANCH			
Sanitary wastewater treatment plant operation in 2022			
Pollutants concentration (mg/l)	**MPC (mg/l)**	**Biodisk plant TENT A**	**Putoks plant TENT B**
Suspended solids (mg/l)			
Plant inlet	-	8 – 52	23 - 146
Plant outlet	75	4 - 34	11 - 131
Biological oxygen demand for 5 days (BOD5)			
Plant inlet	-	12 - 20	45 - 59
Plant outlet	50	7 - 15	26 - 38

Both plants exceeded the limit values for microbiological parameters, while in terms of physico-chemical parameters, Biodisk worked with satisfactory efficiency, unlike Putox, where one sample had an elevated value for suspended matter.

- **Water amounts**

Table 66 provides an overview of water amounts captured and discharged by TENT Branch organisational units for 2022. 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 dischared 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 Veliki Crljeni and the sports centre.

Table 66

NIKOLA TESLA TPPs BRANCH						
Water amounts in 2022. (m^3 / year x10^3)						
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	1.219.275	901,9	1.189.337	-	30.013,4	198,7[1)]
Nikola Tesla B TPP	1.186.003	485,9	1.177.430	-	-	61,7
Kolubara A TPP	3.789	-	-	500	150	391
Morava TPP	52.733	51	50.163	-	-	5,1
TOTAL: NIKOLA TESLA TPP BRANCH	**2.461.800**	**1.438,8**	**2.416.930**	**500**	**30.163,4**	**656,5**

* For raw water preparation
[1)] The quantity of water captured from Obrenovac water supply system is taken as the amount of sanitary water discharged from Biodisk

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 until the entry into force of the prescribed deadline of 12/31/2025.

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 finished yet). During 2022, sampling was done quarterly by accredited laboratories (Institute for operational protection Novi Sad in the first and

Anahem ltd. in remaining three quarters) in order to monitor the efficiency of the plant. In all four 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 fourth quarter was increased. Plant G1 was not in operation for a long time due to problems in functioning, so no sample was taken in the second quarter. In the samples from the first and fourth quarter at the outlet from the G1 plant, the concentration of suspended matter was elevated, and in the sample from the first quarter, the concentration of arsenic was also elevated.

TENT B

In TENT B, the construction of a waste water Treatment Plant is planned, a project for a building permit has been completed.

3.2.4. Emission Measurements of Matters Affecting Soil Quality

During 2022 the testing of soil quality and the content of total and available forms of heavy metals and pollutants in soil was continued.

During 2022, 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), $CaCO_3$ content, capacity of exchangeable cations Na^+, K^+, Ca^{2+}, Mg^{2+}, 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 ($C_6 – C_{40}$), 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 four soil samples at the "Kolubara" TPP, concentration of arsenic exceeds the remediation values prescribed by the applicable legislation. In three soil samples at the "Morava" TPP“ the nickel concentration exceeds the remediation values prescribed by the applicable legislation. In one of the mentioned three soil samples at the "Morava" TPP, the concentration of chromium also exceeds the remediation value prescribed by the applicable legislation. Arsenic, chromium and nickel are not specific substances that are discharged from the TPP Kolubara , on the basis that the limit value of emissions in waste water from thermal power plants at the outlet to surface waters is not prescribed, that is, it is not prescribed by Article 9 of the Regulation on the limit values of the emission of polluting matters into water and deadlines for their achievement ("Official Gazette of RS", no. 67 of September 13, 2011, 48 of May 10, 2012, 1 of January 6, 2016) which prescribes table 1.1. Emission limit values at the point of discharge into surface water, which can be found in Annex 2. Emission limit values for waste water, Chapter I.

Technological waste water, Section 1. Waste water emission limit values from thermal power plants. The limit value of these metals is listed in table 1.3 "Emission limit values for wastewater from thermal energy plants that use coal as an energy fuel, before mixing with other wastewater" from the same regulation, but it is applied to internal waters before mixing with others, which is not the case with ash and slag landfill and other waste water from the thermal power plant in question. Exceeding the remediation value for nickel and chromium from the Law on Soil Protection is a very common occurrence in the territory of R. of Serbia as a consequence of the naturally increased nickel content, i.e. as a consequence of the so-called natural background that depends on the geological characteristics of the soil, as evidenced by the reports of the competent authority on annual testing of agricultural land.

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 III during 2022.

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, unit B2 was connected to the new system, while unit 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. Analyzes of ash from the landfill and 17 soil samples were performed at the TPP "Morava".

In Table 67, the evaluation of measurement results was performed in accordance with the above-mentioned legal regulations.

Table 67

NIKOLA TESLA TPPs BRANCH Content of substances affecting the soil quality in 2022				
Content (mg/kg)	**TENT A**	**TENT B**	**TPP Kolubara**	**TPP Morava**
Chromium(Cr)	Out of 30 samples 2 samples exceed LV and none exceeds RV.	Out of 30 samples, 1 exceeds LV. None exceeds RV .	Out of 17 samples 6 samples exceed LV and none exceeds RV.	Out of 17 samples 7 samples exceed LV and 1 exceeds RV .
Nickel (Ni)	Out of 30 samples 29 samples exceed LV and none exceeds RV .	Out of 30 samples 27 samples exceed LV and none exceeds RV.	Out of 17 samples all 17 samples exceed LV and none exceeds RV .	Out of 17 samples all 17 samples exceed LV and none exceeds RV
Lead (Pb)	Out of 30 samples none exceeds LV nor RV .	Out of 30 samples none exceeds LV nor RV .	Out of 17 samples 3 samples exceed LV and none exceeds RV	Out of 17 samples 10 samples exceed LV and none exceeds RV
Copper (Cu)	Out of 30 samples 5 samples exceed LV and none exceeds RV.	Out of 30 samples 2 samples exceed LV and none exceeds RV .	Out of 17 samples 9 samples exceed LV and none exceeds RV	Out of 17 samples 4 samples exceed LV and none exceeds RV
Zinc (Zn)	Out of 30 samples 4 samples exceed LV and none exceeds RV .	Out of 30 samples 2 samples exceed LV and none exceeds RV .	Out of 17 samples 2 samples exceed LV and none exceeds RV	Out of 17 samples 4 samples exceed LV and none exceeds RV
CADMIUM (Cd)	Out of 30 samples none exceeds LV nor RV .	Out of 30 samples 25 samples exceed LV and none exceeds RV .	Out of 17 samples 15 samples exceed LV and none exceeds RV	Out of 17 samples 16 samples exceed LV and none exceeds RV
Mercury(Hg)	Out of 30 samples 9 samples exceed LV and none exceeds RV .	Out of 30 samples 1 sample exceed LV and none exceeds RV .	Out of 17 samples 16 samples exceed LV and none exceeds RV	Out of 17 samples 7 samples exceed LV and none exceeds RV
Arsenic (As)	Out of 30 samples 1 sample exceed LV and none exceeds RV.	Out of 30 samples 2 samples exceed LV and none exceeds RV .	Out of 17 samples 4 samples exceed both LV and 4 RV .	Out of 17 samples none exceeds LV nor RV
Boron (B)	Out of 30 samples none exceeds LV nor RV.	Out of 30 samples none exceeds LV nor RV .	Out of 17 samples none exceeds LV nor RV .	Out of 17 samples none exceeds LV nor RV
Iron (Fe)	Out of 30 samples none exceeds LV nor RV.	Out of 30 samples none exceeds LV nor RV .	Out of 17 samples none exceeds LV nor RV .	Out of 17 samples none exceeds LV nor RV
Mineral oils (fractions_	Out of 30 samples none exceeds LV nor RV.	Out of 30 samples none exceeds LV nor RV .	Out of 17 samples none exceeds LV nor RV .	Out of 17 samples none exceeds LV nor RV
Total polycyclic and	Out of 30 samples none exceeds LV nor RV.	Out of 30 samples none exceeds LV nor RV .	Out of 17 samples 3 samples exceed LV and none exceeds RV .	Out of 17 samples none exceeds LV nor RV .

3.2.5. Environmental Noise Measurement

During 2022, 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. 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. According to the order given by the inspection, at the locations TENT A and TENT B, noise was measured in the nearest residential zones. Given that the closest residential zones in the vicinity of TENT B are located in the immediate vicinity of the main road and that the predominant influence on the noise level at these measurement points is traffic noise, the authorized legal entity has, for the second measurement in 2022 (24-hour), changed the measuring points at this location. Three measuring points were selected on the borders of the TENT B property, and one measuring point in the nearest residential zone was kept as a control one, and it was the only measuring point where the permissible level was exceeded, and that was in the night period. One 15-minute measurement was performed at TEK. In Table 68, the values for day and night measurements are given as the mean values of the two fifteen-minute measurements. For 24-hour measurements, data on the total daily noise level are given. 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.

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.

According to the current legal regulation, due to undefined acoustic zones, the measured values were compared with the highest permitted noise levels for the day and night period.

At the TENT A location, during the 15-minute measurement, the permitted noise level was exceeded at two measurement points during the night measurement period, while during the 24-hour measurement, there was no exceedance at any measurement point. At the TENT B location, during the 15-minute measurement, at two measuring points the permitted noise level was exceeded both in the daytime and nighttime measurement periods, while at two measuring points, the exceedances were recorded only in the nighttime measurement period. During the 24-hour measurement at TENT B, the exceedance was recorded only at one measurement point, in the nearest residential area, during the night measurement period.

Measurements of noise levels in the vicinity of the TPP Kolubara plant were performed on 26 and 27 of January 2022 by the Institute for Safety and Security at Work from Novi Sad. Noise level measurements were made at 4 measuring points. The measurement of the noise level at each measuring point was carried out continuously for 24 hours with a reference time of 15 minutes. The measurement was performed during operation of the following boilers: Boiler K3 was in operation during the entire measurement period. Boiler K5 was ignited on January 26, 2022. at 1:20 p.m.; Boiler K4 was ignited on January 26, 2022. at 10:45 p.m. Boilers K1 and K6 were not in operation during the measurement. Statistical analysis of the noise level was performed for a 15-minute interval. At all measurement points, the noise was identified as variable, wide-band, without impulses and prominent tones. The measurement and the measurement report are in accordance with the applicable regulations and standards. At the time of the measurements and preparation of the report, there were no data on acoustic zoning in the vicinity of the Kolubara Thermal Power Plant. All measured values are below the limit values for assumed zone 6. Industrial, storage and service areas and transport terminals without residential buildings. Table 68 shows the data of the measured noise levels for the year 2022 for the facilities of the TENT Branch.

Table 68

NIKOLA TESLA TPPs BRANCH					
Noise levels in 2022 (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 borders.	

Measuring points		**TENT A**	**TENT B**	**KOLUBARA A TPP**	**MORAVA TPP**
Day 15 min	**1**	58,1	70,2		52,3
	2	55,4	70,4		59,1
	3	63,0	58,6		57,7
	4	54,6	47,8		56,0
Evening 15 min	**1**	56,8	66,6		51,7
	2	54,9	65,3		62,1
	3	53,8	61,6		54,1
	4	54,4	56,7		59,2
Night 15 мин	**1**	57,7	68,1		51,4
	2	54,0	66,5		59,4
	3	52,6	60,1		54,9
	4	57,3	55,4		55,3
Measuring points		**TENT A**	**TENT B**	**KOLUBARA A TPP**	**MORAVA TPP**
24-hour measurement (total noise level)	**1**	62,9	66,0	60,1	63,4
	2	59,6	54,4	59,5	58,8
	3	53,9	63,1	51,9	62,1
	4	57,3	61,5	58,9	64,7

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

3.2.6. Waste

The production of waste in 2022 is shown in Table 69, and the amount of waste delivered to authorized operators in 2022 is in Table 70. The ash produced in the technological process of burning lignite in the boilers of TE Kolubara and TNT B is stored in a silo and sold to interested customers for use as raw material in the construction industry, based on the contract for the sale of ash, and the rest is disposed of at the ash and slag landfill of PK Ćirikovac. Calculated percentage of fly ash sold in relation to the produced for TENT B: 5.32%, for TE Kolaubar A: 20.95% and for TE Morava: 6.55%.

Table 69

NIKOLA TESLA TPPs BRANCH									
Generated waste in 2022									
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**					
1	Waste printer toner different from 08 03 17	08 03 18	t	0,020	0,000	0,051	0,030	**0,101**	Waste printer toners
2	Ash, slag and dust from boiler (except the dust from boiler stated in 10 01 04	10 01 01	t	2.501.123,37	2.009.835,05	103.288,254	206.995,18	**4.821.241,854**	Ash and slag from coal
	Coal fly ash	10 01 02						**0,000**	
3	Consumed wax and grease	12 01 12*	t	0,000	0,000	0,000	0,000	**0,000**	Waste grease
4	Other hydraulic oils	13 01 13*	t	18,220	4,951	1,262	1,380	**25,813**	Waste hydraulic oils
			t	3,200	0,000	1,404	2,520	**7,124**	Waste turbine oils
5	Other motor oils, transmission and lubricating oils	13 02 08*	t	9,028	14,189	0,855	0,000	**24,072**	Waste oil for lubrication and regulation
			t	2,940	4,580	0,000	5,410	**12,930**	Waste engine oil, gear oil and lubrication oil
6	Other oils for insulation and heat transfer	13 03 10*	t	0,030	0,000	0,000	0,000	**0,030**	Hardening oil
			t	0,872	0,000	0,000	1,160	**2,032**	Waste insulation oil and heat transfer oil
7	Other fuels (including mixtures))	13 07 03*	t	0,000	0,000	0,531	0,000	**0,531**	Waste fuel oil
			t	0,000	9,810	0,000	0,000	**9,810**	Waste sludge and reservoir fuel
			t	0,000	1,224	0,000	0,160	**1,384**	Waste fuel oil
8	Other emulsions	13 08 02*	t	0,000	0,000	0,000	0,000	**0,000**	Emulsion from tank washing
			t	7,560	14,670	0,000	0,000	**22,230**	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	0,252	0,231	0,000	0,000	**0,483**	Waste solvents and solvent mixtures
11	Plastic packaging	15 01 02	t	0,100	0,000	0,000	0,000	**0,100**	plastic packaging waste
12	Wooden packaging	15 01 03	t	0,000	30,000	43,300	23,040	**96,340**	Wooden packaging waste
13	Metal packaging	15 01 04	t	0,140	0,000	0,000	0,000	**0,140**	Metal packaging
				0,000	0,000	0,000	0,000	**0,000**	Waste bottles from fire extinguishers
14		15 01 10*	t	0,055	0,097	0,000	0,000	**0,152**	Waste contaminated glass packaging

NIKOLA TESLA TPPs BRANCH									
Generated waste in 2022									
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**					
	Packaging with residue of hazardous substances or contaminated with hazardous substances		t	1,924	0,333	0,240	0,120	**2,617**	Waste contaminated PVC packaging from chemicals
			t	2,430	0,000	0,800	0,000	**3,230**	Waste metal packaging from oil and lubricants
15	Metal packaging containing dangerous solid porous matrix (e.g., asbestos), including empty bottles under pressure	15 01 11*	t	0,060	0,000	0,000	0,000	**0,060**	Waste gas bottles
16	Absorbent, filter materials, wiping cloths, protective clothing contaminated by hazardous substances	15 02 02*	t	0,000	3,518	0,371	0,400	**4,289**	Cotton waste with oil and heavy oil
			t	0,060	0,686	0,000	0,080	**0,826**	Waste oily filters
			t	2,348	6,600	0,144	0,840	**9,932**	Waste adsorption means with oil and heavy oil
17	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	0,180	0,000	0,000	0,000	**0,180**	Waste non-hazardous filters
18	Wasted tires	16 01 03	t	0,910	0,150	0,000	0,000	**1,060**	Waste pneumatic tires
			t	49,780	38,580	2,140	0,940	**91,440**	Waste rubber conveyor belts
19	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 not containing liquids
20	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	2,415	2,190	0,700	0,590	**5,895**	Waste from electric and electronic devices
21	Lead batteries	16 06 01*	t	10,680	1,800	0,036	0,640	**13,156**	Waste lead batteries
22	Nickle-cadmium batteries	16 06 02*	t	0,240	0,000	0,000	0,000	**0,240**	Ni - Cd batteries
23	Waste containing oil	16 07 08*	t	0,000	0,000	0,000	0,000	**0,000**	Waste from washing liquid fuel tanks
24	Tile and ceramics	17 01 03	t	0,170	0,000	0,000	0,540	**0,710**	Waste ceramics
25	Wood	17 02 01	t	0,040	46,000	0,100	4,840	**50,980**	Wooden waste
26	Glass	17 02 02	t	0,660	0,000	0,000	0,000	**0,660**	Glass waste
27	Plastics	17 02 03	t	2,570	0,000	30,001	0,820	**33,390**	Waste mixed plastics

NIKOLA TESLA TPPs BRANCH									
Generated waste in 2022									
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**					
28	Glass, plastic and wood containing hazardous substances or contaminated with hazardous substances	17 02 04*	t	0,000	74,440	0,000	0,000	**74,440**	Waste railway sleepers
29	Cooper, bronze, brass	17 04 01	t	0,324	0,140	0,604	0,000	**1,064**	Waste and remains of coppers and brass
			t	0,555	3,570	0,940	0,060	**5,125**	Waste copper cables
			t	0,000	0,000	1,640	0,000	**1,640**	Waste brass pipes
			t	0,000	0,000	0,000	0,000	**0,000**	Waste copper transformer windings
			t	0,000	0,000	0,000	0,000	**0,000**	Waste bronze
30	Aluminium	17 04 02	t	0,070	0,000	0,080	0,000	**0,150**	Waste aluminium cables
			t	0,000	15,000	0,000	0,000	**15,000**	Aluminium miscellaneous
			t	8,080	0,000	0,640	0,080	**8,800**	Aluminum sheet
31	Iron and steel	17 04 05	t	0,000	0,000	0,000	0,000	**0,000**	Waste steel sheet
			t	10,220	35,420	4,000	2,380	**52,020**	Waste galvanized and black sheet metal
			t	0,000	0,000	2,000	12,840	**14,840**	Waste iron with admixtures of other substances
			t	0,000	300,00	0,000	0,000	**300,000**	Waste Fe combs
			t	159,680	100,000	58,400	83,820	**401,900**	Waste impact plates
			t	0,000	260,000	0,000	0,000	**260,000**	steam pipeline waste pipe
			t	11,480	1.122,00	0,000	5,200	**1.138,680**	Waste boiler pipelines
			t	60,780	112,770	2,200	22,600	**198,350**	Waste iron up to 5mm thickness
			t	0,000	0,000	168,420	0,300	**168,720**	Waste grey cast
			t	0,250	0,000	16,700	0,000	**16,950**	Waste steel sheet
			t	41,910	41,520	10,142	0,000	**93,572**	Waste and remains from iron and steel
			t	1.308,930	861,600	30,000	61,780	**2.262,310**	Waste iron over 5mm thickness
			t	0,000	0,000	7,900	0,840	**8,740**	Metal shavings
			t	13,640	0,000	0,000	0,000	**13,640**	Waste rail accessories
			t	0,000	0,000	1,000	0,000	**1,000**	Waste railway rails

NIKOLA TESLA TPPs BRANCH									
Generated waste in 2022									
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**					
			t	0,000	0,000	0,000	6,060	**6,060**	Waste mixed metals from magnetic separator
			t	0,000	0,000	0,000	0,000	**0,000**	Waste steel rolls
32	Mixed metals	17 04 07	t	2,430	2,170	3,980	0,000	**8,580**	Waste mixed metals
			t	0,000	2,860	0,000	0,040	**2,900**	Waste metal veneer
			t	0,000	0,000	0,000	0,000	**0,000**	Waste mixed metals with admixtures of ceramics
			t	0,000	0,000	7,560	0,460	**8,020**	Valves
			t	0,000	0,000	0,000	0,000	**0,000**	Waste mixed metals from magnetic separator
33	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
34	Soil and stone containing hazardous substances	17 05 03*	t	0,000	0,000	0,000	0,000	**0,000**	Oil contaminated soil
35	Soil and stone other than specified in 17 05 03	17 05 04	t	0,000	1,820	0,000	0,000	**1,820**	Soil and stone other than in 17 05 03
36	Insulating materials containing asbestos	17 06 01*	t	0,000	0,000	0,000	0,000	**0,000**	Waste asbestos
37	Insulatin material 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**	Insulation braids
			t	102,440	850,000	33,580	6,680	**992,700**	Waste mineral stone wool
38	Construction materials containing asbestos	17 06 05*	t	0,000	16,440	13,220	8,640	**38,300**	Waste salonite plates
39	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	0,000	0,000	0,000	0,000	**0,000**	Waste graphite
			t	3.832,930	7.703,600	0,000	0,000	**11.536,530**	Mixed construction waste

NIKOLA TESLA TPPs BRANCH									
Generated waste in 2022									
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**					
40	Sludge from other industrial waste water treatments other than mentioned in 19 08 13	19 08 14	t	11,760	0,000	0,000	0,000	**11,760**	Sludge from industrial waste water treatment
41	Saturated or spent ion-exchanging resins	19 09 05	t	0,000	4,800	0,000	0,000	**4,800**	Waste ionic mass
42	Minerals (e.g. sand and stone)	19 12 09	t	0,000	0,000	100,000	0,000	**100,000**	Waste white sand
43	Textile	20 01 11	t	0,000	0,000	0,150	0,000	**0,150**	Fire hoses
44	Fluorescent tubes and other mercury-containing waste	20 01 21*	t	0,162	0,000	0,164	0,040	**0,366**	Waste fluorescent tubes
			t	0,070	0,000	0,014	0,040	**0,124**	Waste mercury light –bulbs and thermometers
45	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

Table 70

NIKOLA TESLA TPPs BRANCH									
Taken over amounts of waste in 2022									
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**
			(t)	**TPP Nikola Tesla A**	**TPP Nikola Tesla B**	**TPP Kolubara A**	**TPP Morava**		
	Name	**Index no.**		**Количине**					
1	Waste printer toner different from 08 03 17	08 03 18	t	0,240	0,000	0,000	0,000	**0,240**	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	107.013,38	21.642,77	13.564,00	**142.220,150**	Ash and slag from coal
	Coal fly ash	10 01 02							
3	Consumed wax and grease	12 01 12*	t	0,000	0,000	0,000	0,000	**0,000**	Waste grease
4	Other hydraulic oils	13 01 13*	t	0,000	2,188	0,452	0,700	**14,864**	Waste hydraulic oils
			t	11,420	0,000	0,104	0,000		Waste turbine oils
5	Other motor oils, transmission and lubricating oils	13 02 08*	t	28,860	23,092	0,323	0,000	**57,567**	Waste oil for lubrication and regulation
			t	0,000	2,592	0,000	2,700		Waste engine oil, gear oil and lubrication oil
6	Other oils for insulation and heat transfer	13 03 10*	t	0,410	0,000	0,000	0,000	**2,762**	Hardening oil
			t	1,852	0,000	0,000	0,500		Waste insulation oil and heat transfer oil
7	Other fuels (including mixtures)	13 07 03*	t	0,000	0,000	1,096	0,640	**11,706**	Waste fuel oil
			t	0,000	9,810	0,000	0,000		Waste sludge and reservoir fuel
			t	0,000	0,000	0,000	0,16		Waste fuel oil
8	Other emulsions	13 08 02*	t	0,000	0,000	0,000	0,000	**23,332**	Emulsion from tank washing
			t	0,000	23,332	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	0,252	0,348	0,000	0,000	**0,600**	Waste solvents and solvent mixtures
11	Plastic packaging	15 01 02	t	0,000	0,000	0,000	0,000	**0,000**	Plastic packaging waste
12	Wooden packaging	15 01 03	t	0,000	0,000	25,700	23,040	**48,740**	Wooden packaging waste
13	Metal packaging	15 01 04	t	0,000	0,000	0,000	0,000	**0,000**	Metal packaging
			t	0,000	0,000	0,000	0,000		Waste bottles from fire extinguishers
14		15 01 10*	t	0,055	0,052	0,000	0,000	**3,109**	Waste contaminated glass packaging

	Packaging with residue of hazardous substances or contaminated with hazardous substances		t	1,152	0,430	0,120	0,120		Waste contaminated PVC packaging from chemicals
			t	0,900	0,000	0,280	0,000		Waste metal packaging from oil and lubricants
15	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
16	Absorbent, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated by hazardous substances	15 02 02*	t	0,000	3,972	0,300	0,340	**15,848**	Cotton waste with oil and heavy oil
			t	0,200	0,744	0,000	0,080		Waste oily filters
			t	9,228	0,000	0,144	0,840		Waste adsorption means with oil and heavy oil
17	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
18	Waste tires	16 01 03	t	0,000	0,000	0,000	0,000	**16,66**	Waste pneumatic tires
			t	0,000	14,120	2,540	0,000		Waste rubber conveyor belts
19	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 not containing liquids
20	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	0,000	0,000	0,000	0,000		Waste from electric and electronic devices
21	Lead batteries	16 06 01*	t	0,000	0,000	0,000	0,000	**0,000**	Waste lead batteries
22	Nickle-cadmium batteries	16 06 02*	t	0,000	0,000	0,000	0,700	**0,700**	Ni - Cd batteries
23	Waste containing oil	16 07 08*	t	0,000	0,000	0,000	0,000	**0,000**	Waste from washing liquid fuel tanks
24	Tile and ceramics	17 01 03	t	0,000	0,000	0,000	0,000	**0,000**	Waste ceramics
25	Wood	17 02 01	t	0,000	0,000	0,000	4,840	**4,840**	Wood waste
26	Glass	17 02 02	t	0,000	0,000	0,000	0,000	**0,000**	Glass waste
27	Plastic	17 02 03	t	0,000	0,000	0,000	0,000	**0,000**	Waste mixed plastics
28	Glass, plastic and wood containing hazardous substances or contaminated with hazardous substances	17 02 04*	t	0,000	375,800	61,300	0,000	**437,100**	Waste railway sleepers
29	Cooper, bronze, brass	17 04 01	t	0,000	0,000		0,000	**5,640**	Waste and remains of coppers and brass
			t	0,000	0,000	0,000	3,000		Waste brass pipes
			t	0,000	0,000	1,980	0,160		Waste copper cables
			t	0,000	0,000	0,000	0,000		Waste copper transformer windings

			t	0,000	0,000	0,000	0,000		Waste bronze
30	Aluminium	17 04 02	t	0,000	0,000	0,740	0,000	**3,220**	Waste aluminium cables
			t	0,000	0,000	0,000	0,000		Aluminium miscellaneous
			t	0,000	0,000	0,940	1,540		Aluminum sheet
31	Iron and steel	17 04 05	t	0,000	0,000	0,000	0,000	**426,100**	Waste steel sheet
			t	0,000	4,840	0,000	2,040		Waste galvanized and black sheet metal
			t	0,000	0,000	13,360	13,680		Waste iron with admixtures of other substances
			t	0,000	0,000	0,000	0,000		Waste Fe combs
			t	0,000	0,000	28,400	65,880		Waste impact plates
			t	0,000	0,000	0,000	0,000		Steam pipeline waste pipe
			t	0,000	0,000	0,000	2,180		Waste boiler pipelines
			t	0,000	38,480	38,920	35,640		Waste iron up to 5mm thickness
			t	0,000	0,000	18,420	0,560		Waste grey cast
			t	0,000	0,000	7,400	0,000		Waste and remains from iron and steel
			t	11,740	0,000	50,880	55,140		Waste iron over 5mm thickness
			t	0,000	0,000	19,240	0,000		Waste cast steel
			t	0,000	0,000	4,900	0,600		Metal shavings
			t	0,000	0,000	5,000	0,000		Waste rail accessories
			t	0,000	0,000	0,000	0,000		Waste railway rails
			t	0,000	0,000	0,000	4,940		Waste mixed metals from magnetic separator
			t	0,000	0,000	0,000	3,860		Waste steel rolls
32	Mixed metals	17 04 07	t	0,000	2,340	19,180	0,000	**30,400**	Waste mixed metals
			t	0,000	0,000	0,000	0,000		Waste metal veneer
			t	0,000	0,000	8,420	0,460		Valves
33	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
34	Soil and stone containing hazardous substances	17 05 03*	t	0,000	0,000	0,000	0,000	**0,000**	Oil contaminated soil
35	Soil and stone other than in 17 05 03	17 05 04	t	0,000	0.000	0,000	0,000	**0.000**	Soil and stone other than in 17 05 03
36	Insulating materials containing asbestos	17 06 01*	t	0,000	0,000	0,000	0,000	**0,000**	Waste asbestos-braids
37	Insulatin material other than specified in 17 06 01 and 17 06 03	17 06 04	t	0,000	0,000	0,000	0,000	**689,180**	Insulation braids
			t	102,440	549,780	36,960	0,000		Waste mineral stone wool
38	Construction materials containing asbestos	17 06 05*	t	0,000	16,440	13,220	8,640	**38,300**	Waste salonite plates
39	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	3.832,930	7.703,600	0,000	0,000	**11.536,53**	Mixed construction waste

40	Sludge from other industrial waste water treatments other than mentioned in 19 08 13	19 08 14	t	11,760	0,000	0,000	0,000	**11,760**	Sludge from industrial waste water treatment
41	Saturated or spent ion-exchanging resins	19 09 05	t	0,000	5,440	5,360	0,000	**10,800**	Waste ionic mass
42	Minerals (e.g. sand and stone)	19 12 09	t	0,000	0,000	98,060	0,000	**98,060**	Waste white sand
43	Textile	20 01 11	t	0,000	0,000	0,000	0,000	**0,000**	Fire hoses
44	Fluorescent tubes and other mercury-containing waste	20 01 21*	t	1,300	0,500	0,400	0,260	**2,460**	Waste fluorescent tubes
			t	0,000	0,000	0,000	0,000		Waste mercury light –bulbs and thermometers
45	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 2022 include the following elements:

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

3.3.1. Working Environment Monitoring

- **Environmental Noise Measurement**

In the course of 2022 at all locations of the TENT Branch, in the period from 04.07.- 22.07.2022. periodical examinations of the conditions of the working environment were carried out. At all measuring points where measurements were made, the measured noise value did not exceed the limit values.

3.3.2. Occupational Safety

- **Training**

Table 71 shows the number of employees scheduled for training and the number of employees who underwent training in 2022.

Table71

NIKOLA TESLA TPPs BRANCH					
Training of employees in 2022					
Organisational unit	**Number of employees**	**Foreseen for training**		**Trained**	
		број	**%**	**број**	**%**
Joint services	336	135	40,18	159	117,78
Nikola Tesla A TPP	660	600	90,91	393	65,50
Nikola Tesla B TPP	326	271	83,13	315	116,24
Kolubara TPP	305	241	79,02	312	129,46
Morava TPP	104	94	90,38	117	124,47
Railway transport	474	427	90,08	440	103,04
TOTAL: NIKOLA TESLA TPPs BRANCH	**2.205**	**1.768**	**80,18**	**1.736**	**98,19**

Note: Out of the total number of trained employees, there is a certain number of PRO TENT employees who perform tasks within the TENT organizational unit. Some workers underwent more than one training. for example. due to transfer to other positions etc.

- **Work injuries**

Table 72. gives data on a number of injuries at work in 2022

Table 72

NIKOLA TESLA TPPs BRANCH						
Work injuries in 2022						
Organisational unit	**Number of employees**	**Injuries – number of employees ratio**				
		minor	**severe**	**fatal**	**total**	**%**
Joint services	336	2	0	0	2	0,60
Nikola Tesla A TPP	660	8	2	0	10	1,52
Nikola Tesla B TPP	326	8	1	0	9	2,76
Kolubara TPP	305	1	2	0	3	0,98
Morava TPP	104	2	1	0	3	2,88
Railway transport	474	1	0	0	1	0,21
TOTAL: NIKOLA TESLA TPPs BRANCH	**2.205**	**22**	**6**	**0**	**28**	**1,27**

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 73 provides periodic examinations data verifying the work capability of employees for 2022.

Table 73

NIKOLA TESLA TPPs BRANCH											
Work capability in 2022											
Organisational unit	**Number of employees x**	**Periodical examination**				**Work capability**					
		Referred to examination		**Examined**		**Capable**		**Limited capability**		**Incapable**	
		Број	**%**	**Број**	**%**	**Број**	**%**	**Број**	**%**	**Број**	**%**
Joint services	336	66	19,64	66	100,00	54	81,82	11	16,67	1	1,52
Nikola Tesla A TPP	660	658	99,70	657	99,85	575	87,52	75	11,42	7	1,07
Nikola Tesla B TPP	326	262	80,37	261	99,62	236	90,42	24	9,20	1	0,38
Kolubara TPP	305	230	75,41	226	98,26	200	88,50	25	11,06	1	0,44
Morava TPP	104	102	98,08	102	100,00	85	83,33	17	16,67	0	0,00
Railway transport	474	474	100,00	470	99,16	443	94,26	19	4,04	8	1,70
TOTAL: NIKOLA TESLA TPPs BRANCH	**2.205**	**1.792**	**81,27**	**1.782**	**99,44**	**1.593**	**89,39**	**171**	**9,60**	**18**	**1,01**

3.4. Public Submissions

Public submissions for 2022 are given in Table 74.

Table 74

NIKOLA TESLA TPPs BRANCH			
Public submissions in 2022			
Organisational unit	**Complaint (number, date and by whom submitted)**	**Subject**	**Actions**
TPP NIKOLA TESLA A	On 21.07.2022. a complaint of an individual to the Republic Inspection for Environmental Protection	Air pollution from TENT A stack	An e-mail was sent to the Republic Inspector on 29.07.2022 containing data - explanation regarding black smoke (documentation on the start-up and operation of units, reports of continuous measurement of emissions of polluting substances and other) for the requested period. After that, there was no further action by the inspector.
TPP NIKOLA TESLA B	No public complaints		
TPP KOLUBARA	a complaint of an individual to the Republic Inspection for Environmental Protection	Air pollution as a result of the operation of the Kolubara Thermal Power Plant	The Republic Inspector for Environmental Protection performed a mixed inspection on March 4, 2022. and recorded two illegalities in TPP Kolubara in relation to the provisions of the Air Protection Act. Two measures were imposed, that were already imposed on the Kolubara Thermal Power Plant by the Republic Inspector's Decision in 2021. By the conclusion of the Ministry of Health and Welfare, number 908-480-501-71/2021-07 dated 16.01.2023, the deadline for execution of the ordered measures is extended until June 30, 2023.

NIKOLA TESLA TPPs BRANCH			
Public submissions in 2022			
Organisational unit	**Complaint (number, date and by whom submitted)**	**Subject**	**Actions**
	21.04.2022. a complaint of an individual- High Court in Belgrade, no. П265/21 dated 02.02.2021. (supplement to the lawsuit)	Removal of the risk of damage in accordance with Article 156 of the Law on Obligations Compensation for damages	In connection with the lawsuit submitted by the individual's plaintiff, P265-21, which has as its subject a request to stop the operation of TPP Kolubara A, Heating plant in Vreoci and to close the ash, slag and coal landfill located next to the TPP Kolubara A plant, as well as a request for compensation for material damage and non-material damages, at the hearing, the prosecutor handed over additional documentation to PE EPS regarding which statements for the preparation of answers from TPP Kolubara were submitted to the Sector for Energy Efficiency and Environmental protection, who submitted the answers to the Representation Service of PE EPS.
	Basic Public Prosecutor's Office in Lazarevac - Secretariat for Inspection Affairs of the City Administration of the City of Belgrade	Checking the existence of appropriate documentation, water permits Waste water control at Kolubara TPP	In May 2022, Environmental protection inspectors of the City Administration of the City of Belgrade, have performed extraordinary inspections regarding the verification of the existence of appropriate documentation, water permits and regarding the control of waste water at TPP Kolubara. This was followed by inspection Decisions, Complaints, taking measures and notifying inspectors about the measures taken, as well as requests to extend the deadlines according to the decisions.
	a complaint of an individual - to the Republic Inspection for Environmental Protection	Air pollution as a result of ash dispersion from the TPPK ash landfill	The Republic Inspector for Environmental protection performed an extraordinary inspection on June 10, 2022. and noted in the minutes that at the time of the inspection no illegalities were detected at TPP Kolubara in connection with the provisions of the Law on Environmental Impact Assessment. After that, there was no further action by the inspector.
	19.09.2022. a complaint of an individual- High Court in Belgrade, no. P268/21 dated 02.02.2021. (supplement to the lawsuit)	Removal of the risk of damage in accordance with Article 156 of the Law on Obligations Compensation for damages	In connection with the lawsuit submitted by the individual's plaintiff, P268-21, which has as its subject results of the examination of the soil and ash pit at the location in Veliki Crljeni, as well as the request for compensation for material damage and non-material damages, PE EPS has received a new submission in which the representative of the opposing party submitted new evidence on 19.09.2022. On this occasion, statements for the preparation of answers from TPP Kolubara were submitted to the Department for Energy Efficiency and Environmental Protection, who submitted the answers to the Representation Service of PE EPS.
TPP MORAVA	No public complaints		

4. TPP-OCMS KOSTOLAC BRANCH

TPP-OCMs Kostolac branch comprises the following organizational units:

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

4.1. Overview and Status of Permits

Table 75 provides an overview of obtained permits and applications for new permits or extension of existing ones in 2022 –TPP-OCMs Kostolac Branch.

Table 75

TPP-OCMS KOSTOLAC BRANCH			
Overview and permit status for 2022			
Organizational unit	**Acquired permits and approvals (number and date)**	**New applications for permits or extension of valid permits**	**Note**
TPP KOSTOLAC A	1. Issuing a report that states all requirements stipulated by the regulations related to environmental protection are fulfilled to obtain an energy license for conducting activities in the field of electric power production in TPP Kostolac A, No.923-48-501-00026/2022-04 dated 10.11.2022.	-	-
TPP KOSTOLAC B	1. Decision on a construction permit for building an ammonia liquor tank with additional equipment for the SNCR system, No.351-02-00796/2022-07 dated 30.06.2022. issued by the Ministry of Construction, Transport, and Infrastructure. 2. Decision on the modification of the Decision on a Construction permit for the execution of works on building the solar power plant - spacial area „Petka Landfill“ and cable junction for the needs of the solar power plant on the part of Petka Landfill, the territorial entity Požarevac 1 No.04-351-1027/2022 dated 04.11.2022. issued by the Urban Planning and Construction Department of the City Administration of Požarevac 3. On August 12, 2022, PE EPS registered a substance of calcium sulfate, EC No. 231-900-3 at the European Agency for Chemicals in accordance with REACH Regulation. For calcium sulfate which is produced as part of the flue gas desulphurization process at TPP Kostolac B, PE EPS has obtained a REACH registration number: 01-2119444918-26-0341.	-	-

* CPD- Construction Permit Design

4.2. Monitoring and Environmental Impact

4.2.1. Air Quality Measurements

Air quality monitoring in the vicinity of TPP-OCMs Kostolac Branch organizational units is carried out as part of the Monitoring Plan of the Environmental Management Department. It should be noted that the air quality monitoring in the vicinity of the TPP-OCMs Kostolac Branch is financed by EPS which employs an authorized legal entity.

In Kostolac, there is a measuring point with automatic measurement of pollutants (sulfur 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.

Since 2008 for the services of measuring the quality of environmental air in the vicinity of TPP-OCMs Kostolac Branch, PE EPS, acting through its TPP-OCMs Kostolac Branch, hires an authorized legal entity.

During 2022, for EPS, air quality measurements in the TPPs Kostolac Branch area were performed by the authorized laboratory with the Occupational Safety and Environmental Protection Belgrade, in Belgrade, 7 Deskaseva Street (No. of authorization for immission measurements 353-01-02540/2020-03 dated 15.12.2020.) until July 2022, and since September 2022, the measurements were performed by the Mining and Metallurgy Institute Bor, Chemical Testing Laboratory, 35 Zeleni Bulevar, Bor (No. of the authorization for immission measurement 353-01-02241/2022-03 dated 15.08.2022.)

In 2022, the authorized legal entity carried out the measuring of total particulate matter (TPM), sulfur oxides (SO_2), suspended particulate matter (PM_{10}), soot, and heavy metals (Pb, Cd, As, and Ni) by analyzing samples collected within a month for TPM, while SO_2 concentrations were determined by analyzing 24-hour air samples.

SO2 and soot concentrations were measured on 5 measuring points between January and July 2022, whereas between September and December 2022, the measuring was performed on 7 measuring points, as follows:

1. OCM Cirikovac disposal site-administration building of OCM Cirikovac (January - December);
2. The Village of Drmno – medical center (January - December)
3. The Village of Stari Kostolac– elementary school (January - July), medical center (September - December) ;
4. The Village of Klenovnik, municipality building (January - December)
5. The City of Kostolac – the Kostolac municipality building (January - July);
6. The Village of Petka –elementary school (September - December);
7. The Village of Klicevac, medical center (September - December);
8. The Village of Брадарац, elementary school (September - December).

TPM content was measured on 5 measuring points between January and July 2022, whereas between September and December 2022 it was measured on 7 measuring points as follows:

1. Cirikovac – Cirikovac OCM administrative building (January - Decembar);
2. Drmno – medical center (јануар-јул), ПД ГЕОРАД (September - December) ;
3. Stari Kostolac – elementary school (January-July), medical center (September- December) ;
4. Klenovnik, municipality building (January-July), private households (September - December);
5. Kostolac – Kostolac municipality building (January - July);
6. Petka – elementary school (September - December);
7. Klicevac, church (September - December);
8. Bradarac, elementary school (September - December).

Suspended particulate matter - PM_{10}, were measured on 5 measurement points between January and July 2022, whereas between September and December 2022 they were measured on 7 measurement points:

1. Cirikovac – OCM Cirikovac security booth (January - Decembar);
2. Drmno – Georad company (January - December) ;
3. Stari Kostolac – elementary school (January - July), СКО disposal site security booth (September - December);
4. Klenovnik, municipality building (January - July), private households (September - December);
5. Kostolac – Kostolac municipality building (January - July);
6. Petka –elementary school (September - December);
7. Klicevac, medical center (September - December);
8. Bradarac, elementary school (September - December).

In 2022, suspended particulate matter PM_{10} was measured for seven days. For suspended particulate matter PM_{10}, refer to the number of measurements performed on the above-mentioned measuring points – measurements were not done all 365 days a year for each measurement point, but 62 measurement days a year on measuring points: OCM Cirikovac security booth, 2.Drmno – Georad company, Stari Kostolac, Petka, whereas the new measuring points were introduced in September 2022: Klicevac, Bradarac, the private household in Klenovnik.

The authorized legal entity provided an interpretation of the results of measurements done for EPS in its Air Quality Annual Report 2022, according to the Regulation on conditions for monitoring and air quality requirements.

Table 76 shows the 2022 quality data analysis done by the authorized legal person, in terms of their compliance with legal requirements, for TPP-OCMs Kostolac Branch organizational 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), Law on Air Protection Official Gazette of RS, No. 36/09, 10/13 and 26/21- other law)

Air quality measuring in the vicinity of TPP-OCMs Kostolac is being carried out internally for 30 years by the Monitoring Plan of the Environmental Management Department which is not authorized to perform the measurement of total particulate matter (TPM) and sulfur oxides (SO_2).

Table 76

TPP-OCMS KOSTOLAC BRANCH						
Air Quality in 2022						
Legal compliance (number of data or days exceeding the defined values)						
Air quality indicators		**TPM content (mg/m²/day)**	**Soot (μg/m³)**	**SO_2 (μg/m³) concentration**		
Averaging period		**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**		**-**
*	Measuring points	-	1 day in April			
**	1	No exceedance	-	-		
	2	April 524,5mg/m²/day exceedance October 544,9mg/m²/day exceedance November 501,9mg/m²/day exceedance				
	3.	September,0mg/m²/day exceedance				
	4.	No exceedance				
	5.1	April 764,1mg/m²/day exceedance				
	5.2	нема прекорачења				
	6	September,1mg/m²/day exceedance				
	7	No exceedance				
***	1	No exceedance		No exceedance of limit values for sulfur dioxide concentration more than admissible 24 days in a calendar year (2 exceedances throughout the year)		
	2	No exceedance				
	3	No exceedance				
	4	No exceedance				
	5	No exceedance				

Air quality indicators		Particulate matter PM_{10} ($\mu g/m^3$)		
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 days out of 62 days in total	6 days out of 62 days	
	2	Exceedance of 4 days out of 60 дана	4 days out of 60 days	
	3	Exceedance of 2 days out of 30 days in total	2 days out of 84 days	
	4	Exceedance of 9 days out of 62 days in total	8 дана од укупно 84 days	
	5.1	Exceedance of 9 days out of 34 days in total	9 days out of 28 days	
	5.2	Exceedance of 12 days out of 58 days in total	9 days out of 58 days	
	6	Exceedance of 4 days out of 32 days in total	4 days out of 32 days	
	7	Exceedance of 2 days out of 21 days in total	2 days out of 21 days	

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

4.2.2. Emission Measurements of Matters Affecting Air Quality

Flue gases containing sulfur 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 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 in TPP Kostolac B.

- **Continuous air measurements of air pollutant emissions that affect the air quality in TPPs Kostolac A and Kostolac B**

During 2022 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. and TPP Kostolac B based on 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 2022. the flue gas desulphurization plant at the location of TPP "Kostolac" B was in trial operation, functional tests were performed 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. When the desulphurization plant is not working, waste gases are discharged via the old system for waste gas treatment with ESP only, without performing continuous measurements.

Continuous measurements include flue gas parameters (temperature, pressure, and humidity), volume flow, oxygen content, and mass concentrations as well as calculations of emission factors for sulfur dioxide (SO2), nitrogen oxides (NOx), carbon monoxide (CO) and particulate matter.

In 2022 a new data processing software was installed for dealing with data from the continuous measuring of air pollutant emissions after flue gas desulphurization in TPP Kostolac B, which displays the measurement results for total waste gases produced by both Units B1 and B2 which, according to the Law of Air Protection, together make a single plant.

For the period in which the units of TPP "Kostolac" B operated, and the flue gas desulphurization plant did not work, the calculation was performed based on periodic measurement of pollutant emissions by the authorized laboratory of the Vinca Institute, published in June 2022. During the period when the desulphurization plant did not work, after removing powdered substances, waste gases were discharged via the old stack.

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

Table 77 gives an overview of the continuous and occasional measurement results for the particulate matter emission, NOx и SO2 in TPP Kostolac B in June 2022.

Table 77

TPP-OCMS KOSTOLAC BRANCH		
Occasional and continuous particulate matter emission measurements in 2022 – TPP Kostolac B		
TPPs Kostolac B1 and B2	**Occasional**	**Continuous**
Heat capacity 2 x 1.077,5 MWt		
Particulate matter mg/m3	45,20	18,60
SO2 mg/m3	4.679,40	234,95
NOx mg/m3	240,10	258,08
COx mg/m3	109,50	207,98

Table 78 gives an overview of the continuous measurements of particulate matter emission, NOx, and SO2 in TPP Kostolac A in 2022.

Table 78

TPP-OCMS KOSTOLAC BRANCH		
Occasional and continuous particulate matter emission measurements in 2022 – TPP Kostolac A		
Organizational unit	**TPP Kostolac A**	
Boiler	**A1**	**A2**
Heat capacity MWt	**358**	**689**
SO_2	4.904,83	4.956,44
NO_x (NO_2)	371,50	463,40
CO	46,60	31,70
Particulate matter	106,90	67,40

Control measurement for testing the accuracy of continuous measurements of matters affecting air quality

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

TPP Kostolac A

In September 2022, a functionality test was performed on automatic measuring systems for continuous measurements, in accordance with the requirements of SRPS EN 14181 (QAL 2) on both TPP Kostolac A units.

Automatic measuring systems were calibrated and validated in TPP Kostolac A, on Unit A1 stack, and Report no. E-19/22/ Petroprocess/TEKO-A1/QAL 2 was submitted, whereas when it comes to

TPP Kostolac A, on Unit A2 stack, automatic measuring systems were calibrated and validated was also performed in September, and the Report no. E-18/22/ Petroprocess/TEKO-A2/QAL 2 was submitted by the Mining Institute Belgrade.

TPP Kostolac B

TPP Kostolac B consists of two identical units, each of 348.5 MW. Each unit has its electrostatic precipitator with two branches.

New equipment for flue gas and dust emissions measurement has been installed in the newly constructed desulphurization plant in Kostolac B (B1 and B2) TPP units downstream of the 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 TPP Kostolac B1 and B2 units. TPP Kostolac B Branch, 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 2022 an amendment was submitted to the Request for the issuance of a use permit for the flue gas desulphurization plant which was issued via a Decision no. 351-04-03515/2022-07, dated 11th January 2023, made by the Ministry of Construction, Transport and Infrastructure.

In October 2022, a functionality test of automatic measuring systems for continuous emission measurement was performed on both units of TPP "Kostolac" B, according to the requirements of SRPS EN 14181. The annual control test of automatic measuring systems on the chimney on unit B1 was performed at the inlet of FGD, Report no E-22/22/Petroprocess/TEKO-B1/ FGD/AST inlet and on B2 unit at FDG inlet, Report no. E-23/22/TEKO-B2/ FGD/AST inlet, by the Mining Institute Belgrade.

In September 2022, a functionality test of automatic measuring systems for continuous emission measurement was performed on both TPP Kostolac B units' FGD outlets, according to the requirements of SRPS EN 14181. The annual control test of automatic measuring systems on the chimney of unit B1 was performed at the outlet of FGD, Report no. E-20/22/Petroprocess/TEKO-B1 FGD/ AST outlet and on Unit B2 stack, at FGD outlet, Report no. E-21/22/TEKO-B2 FGD/AST outlet by the Mining Institute Belgrade.

In August 2022, a functionality test of automatic measuring systems was carried out in accordance with the level 3 (QAL3) confidence assurance for the period from September 2021 to August 2022 no. QAL 3-08/22/JPEPS/TEKO B.

Table 79 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 of the TPP-OCMs Kostolac Branch, ending in 2022.

Table 79

TPP-OCMS KOSTOLAC BRANCH									
Level of unit being equipped with devices for continuous emission measurement ending with 2022									
Analyzers		Particulate matters	Emitted matters		Parameters				
			Gases		Content			p and t	Flow rate
			SO_2, $NO_x(NO_2)$, CO; particulate matters	HCl и HF	влага	CO_2	O_2		
TPP KOSTOLAC A	A1	Devices installed on the unit A1 stack, 4 parameters monitored Stack height is 105 m. The platform is located at a level of approximately 60 m.	Devices installed for both boilers on the stack	-	-	-	Devices installed 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. The 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 the measurement of wet O_2 and flue gas flow rate on the stack		Measurement exists on this unit
TPP KOSTOLAC B	B1	Devices are installed after the desulphurization plant (the new stack with a height of 180 m). Each unit has its flue gas duct. Devices for continuous emission measuring are installed on each flue gas duct.	Devices installed on each flue gas duct	-	-	-	Devices installed on each flue gas duct (2 sets)		Installed on each flue gas duct
	B2			-	-	-			

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

Devices for continuous measuring of chloride and fluoride were not installed on any of the TPP Kostolac A and B units, because there is no obligation for continuous measuring of chloride and fluoride emission which bear designations HF and HCl.

Softwares performing statistical analysis of continuous measurements data (SO2, NOx (NO2), CO, and particulate matter are in operation on Kostolac A and B units. у функцији су на блоковима ТЕ „Костолац“ А и ТЕ „Костолац“ Б. New flue gas and particulate matter emission monitoring equipment have been installed (on the stack) after the FGD plant and a new data processing software package has been installed, as well.

- **Annual emissions of matters affecting air quality**

Table 80 provides an overview of particulate matter emission, SO_2, NO_2, and CO and CO_2 for TPP „Костолац“ for 2022. 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 the period between 1st January and 31st December 2022. In units, B1 and B2 mean values of mass concentration and volume flow were calculated based on data from periodic measurements of air pollutant emissions (inspection report by Vinca) and automatic emission measurement on the stack 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 based on continuous measurements on the new stack in

the conditions of the desulphurization plant and occasional measurements on the old stack where waste gases are discharged, which did not pass through the desulphurization plant.

Data related to TPP Kostolac A and B working hours were obtained from the Process Analysis Department.

Table 80

TPP-OCMS KOSTOLAC BRANCH					
Emissions of matters affecting air quality (t/year) in 2022					
Organizational unit	**Particulate matters**	**SO_2**	**$NO_x(NO_2)$**	**CO**	**CO_2**
TPP Kostolac A					
A1	456,29	19.281,80	1.449,39	180,82	843.940,91
A2	307,58	22.409,73	2.156,60	144,31	1.375.547,06
Total Kostolac A	**763,87**	**41.691,53**	**3.605,99**	**325,13**	**2.219.487,96**
TPP Kostolac B					
B1 and B2	497,66	36.560,31	4.014,20	2.632,29	4.884.122,72
Total Kostolac B	**497,66**	**36.560,31**	**4.014,20**	**2.632,29**	**4.884.122,72**
TOTAL: TPP-OCMS KOSTOLAC BRANCH	**1.261,53**	**78.251,84**	**7.620,19**	**2.957,42**	**7.103.610,69**

Table 81. gives an overview of fuel consumption in 2022.

Table 81

TPP-OCMS KOSTOLAC BRANCH		
Fuel Consumption in 2022		
Fuel	**Unit**	**Fuel consumption (t/year)**
TPP KOSTOLAC A		
COAL	A1 - K1	-
	A1 - K2	-
	A1	1. 008. 351
	A2	1. 666. 687
	TOTAL	**2.675.038**
PETROLEUM	A1 - K1	-
	A1 - K2	-
	A1	2. 586
	A2	1. 843
	TOTAL	**4. 429**
TPP KOSTOLAC B		
COAL	Б1	2. 947. 882
	Б2	2 .886.835
	TOTAL	**5.834.717**
HEAVY FUEL OIL	Б1	2. 473
	Б2	2. 181
	TOTAL	**4. 654**

- **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 the 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 и according to 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, and units B1 and B2 - Kostolac B TPP. The guaranteed mass concentration for dust defined by the equipment supplier at the electrostatic precipitator outlet is ≤50mg/Nm3 which is in line with legal requirements for the period until 2027, according to the Regulation on limit values for emissions of pollutants into the air from combustion plants (*Official Gazette of RS* no 6 dated 28th January 2016, no. 67 dated 2nd July 2021). The emissions of particulate matter into the air have been lowered even more by additional treatment of waste gases that are carried out in the newly built desulphurization plant, so as not to exceed the average annual value that is lower than the limit value of 20 mg/Nm^3 that was listed in the EU's Industrial Emissions Directive.

Sulfur dioxide

During the design and construction of TPP Kostolac A and B units, no measures were taken to reduce SO2 emissions, given that at the time no SO2 emission limit values (ELVs) were stipulated.

To reduce sulfur oxide emissions below 200mg/Nm^3 in accordance with EU legislation desulphurization plant construction was finished at the end of December 2016, as well as a new stack with two pipes (each unit, B1 and B2, has its pipe). Performance measurements were executed during the operation of each unit individually and during the simultaneous operation of units.

The operation of the flue gas desulphurization plant has significantly reduced the emitted concentration of sulfur dioxide which amounted to approximately 5000-6000 mg/m3 at the plant inlet, which depends on many factors, so in 2022, the mean annual value of concentration at the outlet after the desulphurization of unit B1 and B2 was 234,95 mg/Nm^3, obviously less than 400 mg/m^3 which is the emission limit value listed in the local regulation in question, i.e, it approaches the emission limit value of 200 mg/Nm^3 prescribed by the EU's Industrial Emissions Directive.

Nitrogen oxides

New burners were installed on TEKO B unit B1 during unit revitalization in 2014 to reduce nitrogen oxide emissions below the level of 200mg/Nm^3. Measurement results indicate considerable nitrogen oxide emission reduction. Emissions before reconstruction ranged from 450 to 600 mg/Nm3.

In 2019, the system for the reduction of nitrogen oxides on TPP Kostolac B2 was installed. In 2022, performance tests were carried out in relation to the reduction of nitrogen oxides by applying certain measures. In 2023, it is planned to build a tank with ammonia liquor with additional equipment, for which in 2022 a construction permit was obtained for the controlled addition of urea as a secondary measure of nitrogen oxide reduction, and it will be implemented within the capital overhaul with the reconstruction of boiler facility that is planned for 2024.

Based on the results of continuous measurements, the mean measured value of nitrogen oxides in 2022 for units B1 and B2 was 258,08 mg/Nm^3.

It is planned to implement a measure on secondary reduction of nitrogen oxide emissions by controlled addition of urea in TPP Kostolac B in 2024, which will provide that the emissions remain within the limit value of 200 mg/Nm3 prescribed by the EU's Industrial Emissions Directive.

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

2022, sampling and testing of wastewater were 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 2022 the quality of drainage water from the gypsum landfill was examined.

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

Demineralized water (demi water) used by the boiler water-vapor 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.

A plant for water preparation to supplement 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 Cirikovac ash landfill.

The TPPs Kostolac Branch Wastewater Management Programme includes physical, chemical, and bacteriological measurements of the following parameters: air and water temperature, water turbidity, pH, electrical conductivity, soluble O_2, % of O_2 saturation, COD, BOD_5, unfiltered water evaporation residue, filtered water evaporation residue, total suspended particulate matter, particulate matter, total surfactants, mineral oils, phenols, alkalinity, F, Cl, NO_2, NO_3, SO_4, PO_4, NH_4, Ca, Mg, hardness, Al, Fe, Mn, Cd, Cr^{6+}, total Cr, Cu, Ni, Zn, Pb, Hg, As, B, and 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 of 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 TPP Kostolac B, in the area of the oil tanks at TPP-OCM A and the area of the gas station at OCM Drmno; at the gypsum disposal site
- Quality of sanitary water from the plants in TPP Kostolac B;
- •Quality of water coming from the plants for treating water contaminated with oil and fuel oil in TPP Kostolac B.

Long-term studies have shown that concentrations of sulfate and arsenic are essential parameters used to monitor the ash landfill's impact on groundwater. Sulfate ions originating from the landfill migrates fastest, and are 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 groundwater 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

Discharged water quality measurement results are presented in the Environmental Report prepared every year for each organizational 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 groundwater quality was controlled in 2022 by the accredited legal person for chemical testing, Mining and Metallurgy Institute Bor, and Institute for Occupational Safety Novi Sad.

Table 82 provides the analysis of wastewater and recipient watercourse quality data in 2022 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 82

TPP-OCMS KOSTOLAC BRANCH		
Wastewater and watercourses-recipients quality in 2022.		
Organizational unit **Water type**	**TPP Kostolac A**	**TPP Kostolac B**
Drainage wastewater from the ash landfill	▪ Electrical conductivity:590,0-844,0 µs/cm ▪ Arsenic:10 - 33µg/l ▪ Sulphates: 166,6-266,6 mg/l	Main water sump at OCM Cirikovac landfill ▪ Electrical conductivity: 2160-2200 µs/cm ▪ Arsenic: 10-43 µg/l ▪ Sulphates: 504,9-869,6 mg/l
Overflow wastewater from the ash landfill	▪ Electrical conductivity: 488,0-671,0 µs/cm ▪ Arsenic: 53-89 µg/l ▪ Sulphates: 78,43-223,10 mg/l	
Watercourse (recipient)	There were no significant changes in the Danube River quality upstream-downstream from TPP Kostolac A: ▪ Arsenic: <5 µg/l, bellow MLC-50 µg/l, upstream and downstream from the discharge point ▪ Sulphates: 18,8-161,8 mg/l узводно,16,56-32,67 mg/l низводно ▪ Mineral oil, at the Danube testing points upstream and downstream <14 µg/l No temperature increase in the Danube River water	There were no significant changes in the Mlava River quality downstream - upstream from TPP Kostolac B: ▪Arsenic: upstream and downstream <5 µg/l from the discharge point ▪ sulphates: 22,19-38,16mg/l, upstream and 22,84-33,03 mg/l downstream ▪ Mineral oil in the Mlava River upstream and downstream was < 20µg/l No temperature increase in the Danube River water

Table 83 provides the analysis of groundwater quality data in the piezometers at the locations of TPP-OCMs Kostolac Branch. In 2022 groundwater quality was controlled in 18 piezometers.

Table 83

TPP-OCMS KOSTOLAC BRANCH			
Groundwater quality - piezometers in 2022			
Concentration	**Permitted values**		**Organizational unit**
	MPC	**RV**	**TPP Kostolac A и TPP Kostolac B**
Sulfates (mg/l)	**250**		in piezometers around cassette B:167,6-271,5 in piezometers around cassette C: 144,0-242,0 in piezometers around the Cirikovac ash landfill: 7,0-550,40 piezometers away from the SKO landfill: 240,0-817,60 around the coal yard D 5: 31,79-43,94 piezometers around oil tanks TPP A: 19,20-142,30 piezometers at gypsum disposal site:46,02-239,40
Arsenic (µg/l)	**10**	**60**	in piezometers around cassette B:40-287 in piezometers around cassette C: 10-45 in piezometers around the Cirikovac ash landfill: <10 piezometers away from the SKO landfill: <10 around the coal yard D5: <10 piezometers around oil tanks TPP A: <10 piezometers at gypsum disposal site: <10
Zink (mg/l)	**3.000**	**800**	in piezometers around cassette B:30-102 in piezometers around cassette C:20-129 in piezometers around the Cirikovac ash landfill: 30-134 piezometers away from the SKO landfill: 36-12600 around the coal yard D5: 1240-2710 piezometers around oil tanks TPP A:30-84 piezometers at gypsum disposal site:40-746
Manganese (mg/l)	**50**		in piezometers around cassette B: 0,004-0,021 in piezometers around cassette C: 0,011-0,044 in piezometers around the Cirikovac ash landfill: 0,004-2,11 piezometers away from the SKO landfill: 0,006-1,57 around the coal yard D5: 0,121-0,182 piezometers around oil tanks TPP A: 0,014-0,933 piezometers at gypsum disposal site:0,,08-1,182
Ammonia (mg/l)	**0.1**		in piezometers around cassette B: 0,078-0,436 in piezometers around cassette C: 0,078-0,443 in piezometers around the Cirikovac ash landfill: 0,078-8,86 piezometers away from the SKO landfill: 0,078-0,949 around the coal yard D5: 0,078-0,638 piezometers around oil tanks TPP A: 0,07-5,79 piezometers at gypsum disposal site:0,078-0,451
Nitrites (mg/l)	**0.03**		in piezometers around cassette B: <0,003 in piezometers around cassette C: 0,003-0,016 in piezometers around the Cirikovac ash landfill: <0,003 piezometers away from the SKO landfill: <0,003 around the coal yard D5: <0,003 piezometers around oil tanks TPP A: <0,003 piezometers at gypsum disposal site:0,003-0,391
Nitrates (mg/l)	**0.05**		in piezometers around cassette B: 0,113-0,271 in piezometers around cassette C: 0,113-0,422 in piezometers around the Cirikovac ash landfill: 0,113-9,66 piezometers away from the SKO landfill:0,113-2,170 around the coal yard D5: 0,113-0,350 piezometers around oil tanks TPP A:0,113-3,473 piezometers at gypsum disposal site:0,113-10,44
Copper (µg/l)	**2000**	**75**	in piezometers around cassette B:20-36 in piezometers around cassette C: 20-39 in piezometers around the Cirikovac ash landfill: 20-60 piezometers away from the SKO landfill:20-46 around the coal yard D5:< 20 piezometers around oil tanks TPP A: :< 20 piezometers at gypsum disposal site:20-45

TPP-OCMS KOSTOLAC BRANCH			
Groundwater quality - piezometers in 2022			
Concentration	**Permitted values**		**Organizational unit**
	MPC	**RV**	**TPP Kostolac A и TPP Kostolac B**
Cadmium (µg/l)	**3**	**6**	in piezometers around cassette B: <0,4 in piezometers around cassette C: <0,4 in piezometers around the Cirikovac ash landfill: <0,4 piezometers away from the SKO landfill:0,4-1,3 around the coal yard D5:0,4-0,6 piezometers around oil tanks TPP A:0,4-2,3 piezometers at gypsum disposal site:0,4-5
Lead (µg/l)	**10**	**75**	in piezometers around cassette B: 10-20 in piezometers around cassette C: 10-39 in piezometers around the Cirikovac ash landfill: <10 piezometers away from the SKO landfill: <10 around the coal yard D5: <10 piezometers around oil tanks TPP A: <10 piezometers at gypsum disposal site:10-285
Mercury (µg/l)	**1**	**0,3**	in piezometers around cassette B: <0,3 in piezometers around cassette C: <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 piezometers at gypsum disposal site: <0,3
Mineral oil (µg/l)		**600**	in piezometers around cassette B: 10-77 in piezometers around cassette C: <10 in piezometers around the Cirikovac ash landfill: 10-28 piezometers away from the SKO landfill:10-54 around the coal yard D5: 10-58 piezometers around oil tanks TPP A:10-58 piezometers at gypsum disposal site:10-246

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) according to the Law on Soil Protection.

Table 84 provides an analysis of data related to sanitary wastewater quality at the inlet and outlet of the newly built plant fort treatment(SBR-Sequencing Batch Reactor), for 2022.

Table 84

TPP-OCMS KOSTOLAC BRANCH	
Sanitary wastewater treatment plant operation in 2022.	
Pollutants concentration (mg/l)	**SBR (Sequencing Batch Reactor)TPP Kostolac B**
Suspended solids (mg/l)	
Plant inlet	185,60
Plant outlet	4,41
5-day biological oxygen demand (БПК$_5$)	
Plant inlet	12,27
Plant outlet	5,81
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 85 provides an overview of water amounts captured and discharged per the organizational units of the TPP-OCMs Kostolac Branch for 2022.

Table 85

TPP-OCMS KOSTOLAC BRANCH					
Water amounts in 2022. (m^3 /год 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*			
TPP KOSTOLAC A	315.510	-	303.765	3.463	35
TPP KOSTOLAC B	759.750	857	756.210	2.279	121
УКУПНО: TPP-OCMS KOSTOLAC BRANCH	**1.075.260**	**857**	**1.059.975**	**5.742**	**156**

* For technical and potable water preparation
**purified water

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

The annual amount is calculated based on data on the capacity and water capture and discharge pumps operating time. In cases of gravitational wastewater discharge calculations are made based on 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 into operation in 2019. Upon system commissioning, new system performances were tested.

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

Kostolac B TPP units were connected to the new thick slurry collection, transportation, and disposal system together with water in a ratio of 1:1, instead of the previous system that used 1 part of bottom and fly ash and 10 parts of water. Ash and slag are disposed to the Cirikovac OCM. A thick slurry transportation system is of recirculation type because water serves to transport ash and slurry and circulates the system.

During 2022, in the course of the flue-gas desulphurization trial operation, an inspection of this facility's wastewater was carried out in accordance with the Regulation on Emission Limit Values of Pollutants in Water and deadlines for reaching them, after flue-gas desulphurization, 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 to discharge it into the pumping station until the construction of the wastewater treatment facility is finalized.

In 2020, the construction of the TPP Kostolac B Wastewater Treatment Facility 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 of the updated Environmental Impact Assessment Study for the Wastewater Treatment Facility (no.353-02-00252/2019-03 as of 11th July 2019).

In 2022, Wastewater Treatment Facility that was used for purifying water after flue gas desulphurization and the acid-alkaline water coming from the water treatment plant has been put into the trial run and all other phases of performance guarantee testing.

At the location of TPP Kostolac B, in 2022 all wastewater treatment plants were put into the trial run. The decentralized wastewater treatment system consists of three major plants:

1. Sanitary wastewater treatment plant – SBR (Sequencing Batch Reactor) 1500 EC
2. Oily and fuel oily wastewater treatment plant, with a capacity of 2x 30m3/h;

3. Wastewater treatment plant from flue gas desulphurization and acid-alkaline water from a chemical water treatment plant, with a capacity of 2 x 45m3/h.

1. The sanitary wastewater treatment plant was built in 2020 and put into trial operation. In 2022, the sanitary wastewater treatment plant in TPP Kostolac B purified 121544m^3 of sanitary wastewater from the thermal powerplant parameter and worker's barracks located under TPP Kostoac B. The process of sanitary water treatment includes equalizing, mechanical treatment on an automatic strainer, biochemical purification inside the SBR reactors, and the stabilizing of mud. The recepient of purified water is the river Mlava.

2. Oily and fuel-oily wastewater treatment plant was finished and put into trial operation in 2021. The sources of oily wastewater to be purified are the mechanical room of the main production facility in B1, B2, and the coming B3 and covered coal storage. The sources of fuel oily wastewater to be purified are the external fuel oil plant, ground-level fuel oil tank bund, plateau for decanting fuel oil tank, and unit boiler rooms.

3. The plant for purification of wastewater from desulphurization of flue gases and acid-alkaline water from the plant for chemical preparation of water was put into trial operation in 2022 and all tests were carried out to ensure its reliable operation. Sources of wastewater are FGD and CPW which are directed to this facility from the wastewater hydro-cyclones overflow from B1, B2, and the coming B3 units, water that is used for washing the wet ESPs, water that is used for washing sand filters from B1, B2, and the coming B3 units, water used for regeneration of ion-exchanging resins of FGD and CPW and permeate from the standby osmosis.

During the trial run in 2022, 1.444 m^3 of wastewater was purified when performance guarantee tests were conducted.

Within the wastewater treatment plant in TPP Kostolac B, 4 oil separators were installed on the atmospheric sewage.

4.2.4. Emission Measurements of Matters Affecting Soil Quality

In 2022, testing of soil quality was performed as well as determining the content of total and accessible forms of heavy metals and matters which affect the soil quality as well as the inspection of chemical composition on the territory of TPP-OCMs Kostolac Branch. TPP-OCMs Kostolac Branch performs the monitoring of the presence and content of matters which affect the soil quality on an annual level.

In 2022, one soils sampling and testing was performed by an authorized person that has authorization for soil monitoring – Occupational Health and environmental protection – *Belgrade* Ltd. and Institute for Soil Science, Belgrade, on the territory of TPP Kostolac A, TPP Kostolac B, and OCM Drmno. The taken samples were put through the following analysis: mechanical composition of the soil, soil acidity (active acidity pH y H_2O, substance acidity pH y 1M KCl), the content of $CaCO_3$, the capacity of exchangeable cations Na^+, K^+, Ca^{2+}, Mg^{2+}, degree of base saturation, organic matter content, physical characteristics of soil: dry soil density; solid state density and total porosity; accessible water; the speed of water permeability, structure, and hardness, chemical features of soil: soil hydrolytic acidity, the accessibility to macroelements (N, P, K, Ca, Mg), total nitrogen and sulfur, the electrical conductivity of soil extract, the content of nitrates and nitrites, total and accessible heavy metals (Cr, Ni, Pb, Cu, Zn, Cd, Hg, B, As and Fe), potentially toxic elements, hydrocarbons originating from petroleum (C_6 – C_{40}), polycyclic aromatic hydrocarbons (PAH). The Soil Monitoring Program includes field and lab measurements at representative measuring points that were marked on the topographical maps (points determined by GPS), which will enable tracking changes of the tested parameters at the same measuring points in the following period.

The number and layout of measuring points are defined in accordance with Annex 2 to the Rulebook on the list of activities that may cause soil pollution and degradation, the procedure,
data content, deadlines, and other requirements for soil monitoring (Official Gazette of the RS, No 102/2020). Thereby the following was particularly taken into account: the points where it is known that soil or underwaters have been polluted, locations for storing raw materials, chemicals, or waste,

sites with immediate proximity to plants where the production process takes place, locations where chemicals and/or waste are being loaded and unloaded, storage places of new and worn equipment which can be a potential source of soil pollution, points where machines are being maintained and serviced, equipment washing locations, points near underground tanks, areas outside the factory parameters which can be affected by factory activities. The content of heavy metals and other toxic elements in the soil was present in the usual amounts which were below the remediation values for nickel, copper, mercury, zinc, lead, chromium, and arsenic.
Valuation of data was carried out in accordance with the Rulebook on the list of activities that may cause soil pollution and degradation, the procedure, data content, deadlines, and other requirements for soil monitoring (Official Gazette of the RS, No 102/2020) Regulation on limit values of polluting, harmful and dangerous substances in soil (Official Gazette of the RS, No 30/2018, 64/2019), Annex 1, Limit maximum and remediation values of polluting, harmful and dangerous substances in soil.

On the territory of TPP Kostolac A the samples were taken from the surface layer at profile between 0 and 30 cm, on 12 points, whereas on the territory of TPP Kostolac B, they were taken from 16 points. Table 86 shows the concentration of matter affecting the soil quality.

Table 86

TPP-OCMS KOSTOLAC BRANCH		
The concentration of matters affecting the soil quality in 2022		
Content (mg/kg)	**TPP KOSTOLAC A**	**TPP KOSTOLAC B**
Chromium (Cr)	Out of 12 samples - 2 samples exceeded LV and none of them exceeded RV.	Out of 14 samples - none of them exceeded LV and none of them exceeded RV.
Nickel (Ni)	Out of 12 samples - 12 samples exceeded LV and none of them exceeded RV.	Out of 14 samples - 8 samples exceeded LV and none of them exceeded RV.
Lead (Pb)	Out of 12 samples - 2 samples exceeded LV and 1 exceeded RV.	Out of 14 samples - 1 sample exceeded LV and none of them exceeded RV.
Copper (Cu)	Out of 12 samples - 12 samples exceeded LV and 2 exceeded RV.	Out of 14 samples - 4 samples exceeded LV and none of them exceeded RV.
Zinc (Zn)	Out of 12 samples - 2 samples exceeded LV and none of them exceeded RV.	Out of 14 samples - none of them exceeded LV and none of them exceeds RV.
CADMIUM (Cd)	Out of 12 samples – none of them exceeded LV and none of them exceeded RV.	Out of 14 samples - none of them exceeded LV and none of them exceeds RV.
Mercury (Hg)	Out of 12 samples - 12 samples exceeded LV and none of them exceeded RV.	Out of 14 samples - 14 samples exceeded LV and 1 exceeded RV.
Arsene (As)	Out of 12 samples – 1 sample exceeded LV and none of them exceeded RV.	Out of 14 samples - none of them exceeded LV and none of them exceeds RV.
Pine (B)	Out of 12 samples - none of them exceeded LV and none of them exceeded RV.	Out of 14 samples - none of them exceeded LV and none of them exceeds RV.

Iron (Fe)	Out of 12 samples - none of them exceeded LV and none of them exceeded RV.	Out of 14 samples - none of them exceeded LV and none of them exceeds RV.
Mineral oils (fractions C6-C40)	Out of 12 samples - none of them exceeded LV and none of them exceeded RV.	Out of 14 samples - none of them exceeded LV and none of them exceeds RV.
Укупни Total polycyclic	Out of 12 samples - none of them exceeded LV and none of them exceeded RV.	Out of 14 samples - none of them exceeded LV and none of them exceeds RV.

4.2.5. Environmental Noise Measurements

When it comes to the area that belongs to thermal power plants of the TPP-OCMs Kostolac Branch, in 2022 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, the Institute of Public Health, at 6 measurement points:

1. TPP Kostolac A - "Prim" Kostolac (the east side of TPP Kostolac A)
2. TPP Kostolac A – „Laser- Balkan", which used to be FIO Minel (south side of TPP Kostolac A
3. TPP Kostolac A – the port of Kostolac (west side of TPP Kostolac A)
4. TPP Kostolac B – the village of Drmno (south side of TPP Kostolac B)
5. TPP Kostolac B – the lake of TPP Kostolac B(west side of TPP Kostolac B)
6. TPP Kostolac B – Viminacium (north-east side of TPP Kostolac B)

Table 87 shows related to the measured environmental noise levels in 2022 for the TPP Kostolac Branch (organizational unit Thermal Power Plant Kostolac A and Thermal Power Plant Kostolac B), during the winter 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).

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

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 acoustic zoning.

Table 87

TPP-OCMS KOSTOLAC BRANCH							**ELV**
Noise levels in 2022 (dB) (A)							
Measuring point	**I measured – the winter**						
	TPP Kostolac A			**TPP Kostolac B**			
	PRIM	**Laser- Balkan**	**the port of Kostolac**	**the village of Drmno**	**The lake**	**Viminacium**	
day	49,8	46,9	52,5	44,0	55,5	52,7	**65**
day	50,4	46,4	52,1	53,2	54,2	49,3	**65**
evening	55,9	48,7	50,4	58,8	53,5	48,1	**65**
night	58,5	47,9	47,4	60,6	55,1	56,2	**55**
night	58,7	45,4	48,1	59,9	55,7	59,5	**55**

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

4.2.6. Waste

Table 88 shows waste production in 2022 for TPP-OCMs Kostolac Branch (parts of the Branch: TPPs Kostolac A and Kostolac B).

Table 89 shows quantities of waste that were delivered in 2022 by the TPP-OCMs Kostolac Branch parts of the Branch: TPPs Kostolac A and Kostolac B).

The ash that is produced during the technological process of lignite combustion that takes place in the TPP Kostolac B boilers is stored in a silo and sold dry to the interested buyers who use it as a raw product in the construction industry, based on the contract for the purchasing of ash, whereas the rest of it is disposed at a fly and bottom ash landfill of OCM Cirikovac. In this way, each year approximately 10% of ash that is separated by the ESP is sold.

In accordance with Waste Management Law, the Ministry of Environmental Protection has issued a certificate to TPP Kostolac Branch for registering the 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 gypsum in the by-product registry.

In 2022 TPP-OCMs Kostolac Branch delivered to the interested buyers gypsum as a by-product, in the amount of 28,210.24 tons.

On August 12, 2022, PE registered a substance calcium sulfate, ES No. 231-900-3 at the European Agency for Chemicals, in accordance with the REACH Regulation. For calcium sulfate which is produced as part of the flue gas desulphurization process at TPP Kostolac B, PE EPS has obtained a REACH registration number: 01-2119444918-26-0341.

Table 88

TPPs & OCMs Kostolac Branch						
Waste generated in 2022 (t)						
No.	**Rulebook waste categories, its testing and classification (OG RS № 56/2010, 93/2019 and 39/2021)**	**Index no.**	**Organizational 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	0,007	0,000	**0,007**	
2.	Fly ash from coal	10 01 02	542.949,400	1.149.069,00	**1.692.018,400**	-
3.	Solid waste based on calcium in the process of flue gas desulphurization	10 01 05	-	151.730,000	**151.730,000**	Gypsum
4.	Mineral non-chlorinated hydraulic oil	13 01 10*	7,937	5,070	**13,007**	-
5.	Mineral non-chlorinated motor oils, gearbox oils and lubricating oils	13 02 05*	0,000	0,072	**0,072**	
6.	Other emulsions	13 08 02*	0,230	0,000	**0,230**	Oil, water, grease, soil
7.	Packaging containing residues of hazardous substances or contaminated by hazardous substances	15 01 10*	0,110	0,320	**0,430**	Hydrazine packing
			0,000	0,796	**0,796**	Oil packing
8.	Absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing, contaminated with hazardous substances	15 02 02*	0,200	0,000	**0,200**	Cotton
9.	Waste tires	16 01 03	0,000	1,300	**1,300**	vehicle tires
10.	Slate and ceramics	16 06 01*	0,150	0,960	**1,110**	
11	Glass	17 02 02	1,300	0,000	**1,300**	
12	Plastic	17 02 03	0,080	0,080	**0,160**	
13	Copper, bronze, brass	17 04 01	0,000	0,000	**0,000**	copper
			1,980	30,140	**32,120**	brass
14	Aluminum	17 04 02	1,810	0,000	**1,810**	-
15	Iron and steel	17 04 05	20,800	866,66	**887,46**	Various thickness
			229,460	495,46	**724,92**	Impact plates and billets
16	Cables different than those stated in 17 04 10	17 04 11	0,000	0,200	**0,200**	-
17	Insulation material different than those stated in 17 06 01 and 17 06 03	17 06 04	0,800	0,000	**0,800**	Mineral wool
			9,450	0,000	**9,450**	Preinsulation pipes
18	Saturated or exhausted ion exchange resins	19 09 05	5,000	0,000	**5,000**	
19	Plastics and rubber	19 12 04	59,354	9,500	**68,854**	Гумене траке
20	Fluorescent tubes and other waste containing mercury	20 01 21*	0,200	0,000	**0,200**	-

TPPs & OCMs Kostolac Branch						
Waste generated in 2022 (t)						
No.	**Rulebook waste categories, its testing and classification (OG RS № 56/2010, 93/2019 and 39/2021)**	**Index no.**	**Organizational unit**			**NOTE**
	Name		**TPP KOSTOLAC A**	**TPP KOSTOLAC B**	**TOTAL (t)**	
21	Discarded electrical and electronic equipment which contains dangerous components	20 01 35*	0,837	0,750	**1,587**	Electric waste
22	Bulk waste	20 03 07	0,583	0,000	**0,583**	

Table 89

TPPs & OCMs Kostolac Branch						
Waste delivered in 2022						
no.	**Rulebook waste categories, its testing and classification (OG RS № 56/2010, 93/2019 and 39/2021)**	**Index no.**	**Organizational unit**			
	Назив		**TEKO A**	**TEKO B**	**Total (t)**	**Note**
1.	Fly ash from coal	10 01 02	-	12.102,720	**12.102,720**	Sale with financial compensation
2.	Solid waste based on calcium in the process of FGD	10 01 05	-	128.845,230	**128.845,230**	Sale with financial compensation
3.	Mineral non-chlorinated hydraulic oil	13 01 10*	10,522	9,000	**19,522**	Service providing contract related to waste disposal
4	Mineral non-chlorinated motor oils, gear and lubrication oils	13 02 05*	0,000	0,432	**0,432**	Sale with financial compensation
5	Other oils for insulation and transfer of heat	13 03 10*	11,872	0,000	**11,872**	Sale with financial compensation
6	Waste rubber	16 01 03	0,000	2,000	**2,000**	Sale with financial compensation
7	Lead batteries	16 06 01*	0,780	1,300	**2,080**	Sale with financial compensation
8	Glass	17 02 02/ 17 01 02	3,300	0,000	**3,300**	Sale with financial compensation
9	Copper, bronze, brass	17 04 01	7,480	30,140	**37,620**	Sale with financial compensation
10	Aluminium	17 04 02	1,760	0,000	**1,760**	Sale with financial compensation
11	Iron and steel	17 04 05	153,060	865,880	**1.018,94**	Sale with financial compensation
		17 04 05	229,460	495,460	**724,920**	Sale with financial compensation
12	Plastic and rubber	19 12 04	74,200	10,400	**84,600**	Sale with financial compensation

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 2022, in TPP Kostolac A and TPP Kostolac B, monitoring of the working environment was carried out, i.e. noise measurements were carried out, namely:

- at TPP Kostolac A, noise measurements were made at 68 workplaces. At one measuring point, the measured value of the equivalent sound pressure level exceeds the limits of the maximum permissible equivalent sound pressure level.

- at TPP Kostolac B, noise measurements were made at 116 workplaces. At forty-two measuring points, the measured value of the equivalent sound pressure level exceeds the limits of the maximum permissible equivalent level.

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.

Also, in TPP Kostolac A and TPP Kostolac B, training was performed for 126 employees engaged.

Table 90 shows number of employees to be trained and number of employees who have taken training in 2022.

Table 90

TPPs & OCMs Kostolac Branch					
Training of employees in 2022					
Organizatonal unit	**Number of employees**	**For training**		**Trained**	
		Number	**%**	**Number**	**%**
TPP Kostolac A	346	304	87,86	488	160,53
TPP Kostolac B	368	288	78,26	312	108,33
Total: TPPs & OCMs Kostolac Branch	**714**	**592**	**82,91**	**800**	**135,14**

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 91 shows data on number of injuries at work in 2022.

Table 91

TPPs & OCMs Kostolac Branch						
Injuries at work in 2022						
Organizational unit	**Number of employees**	**Injuries – Number of employees' ratio**				
		Light	**Serious**	**Fatalities**	**Total**	**%**
TPP Kostolac A	346	2	1	1	4	1,16
TPP Kostolac B	368	2	1	0	3	0,82
TOTAL: TPPs & OCMs Kostolac Branch"	**714**	**4**	**2**	**1**	**7**	**0,98**

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 92 shows data on periodic examination of working capability of employees 2022.

Table 92

TPPs & OCMs Kostolac Branch											
Work capability in 2022											
Organizational unit	**Number of employees**	**Perodic examinations**				**Work capabilty**					
		Instructed to examination		**Examined**		**Capable**		**Limited capability**		**Not capable**	
		No.	**%**	**No.**	**%**	**Бр.**	**%**	**No.**	**%**	**No.**	**%**
TPP Kostolac A	346	304	87,86	302	99,34	286	94,70	16	5,30	0	0,00
TPP Kostolac B	368	288	78,26	288	100,00	275	95,49	13	4,51	0	0,00
Total: TPPs & OCMs BRANCH KOSTOLAC	**714**	**592**	**82,91**	**590**	**99,66**	**561**	**95,08**	**29**	**4,92**	**0**	**0,00**

4.4. Public submissions

Public submissions in 2022 are shown in Table 93.

Table 93

TPPs & OCMs Kostolac Branch		
PUBLIC SUBMISSIONS IN 2022		
Organizational unit	**Claim**	**Subject of claim Actions taken**
TPP Kostolac A TPP Kostolac B	Klenovnik village residents' claim According to request of the natural person	-On 07/07/2022, upon the request of a natural person from the village Klenovnik, an extraordinary inspection was carried out at the location of the OCM Ćirikovac disposal due to a complaint of dust spreading and direct exposure of the applicant's household caused by the current construction works on the expansion of the OCM Ćirikovac ash and bottom ash disposal. The competent Republic Inspector of Environmental Protection ordered the supervised entity an action by Decision no. 910-480-501-00046/2022-04 from July 27, 2022. to carry out, through an authorized organization, to obtain the results of the measurement of polluting substances, for a duration of 12 months for precipitable substances and a total of suspended substances for a period of 51 days by installing the device in the residential area of the household of the natural person who submitted the claim. The supervised entity carried out the measure and submitted information and evidence, and by letter No. 2460500-E.05.01-749113/1-2022 dated November 4, 2022, submitted reports on ambient air testing to the competent inspector. Action of execution is in progress. - On 01.12.2022, following a request by a natural person from the village Stari Kostolac that there was a spillage of the contents of the ash pipeline at CP 1118 Kostolac village owned by the aforementioned, an Official Note was made according to the order given by the Property Legal Affairs Service of the TPPs & OCMs Kostolac Branch. It was found that in the northern part of the plot of about 20 ares, ash content leakage was noted about 200 meters north of the mentioned plot, so that the content of the ash pipeline is visibly present in the northern part of the plot without traces of solid ingredients of the poured contents of the ash pipeline. According to the report, the competent Republic Inspector carried out an extraordinary inspection on 08.02.2023.

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 2022 are in Table 94.

Table 94

PANONSKE CHPPS BRANCH			
Overview and Status of Permits for 2022			
Organizational unit	**Obtained permits and approvals (number and date)**	**New requestes for obtaining or extension of valid permits**	**Note**
NOVI SAD CHPP	-	IPPC permit	The submission of a new request for obtaining a permit is in progress
ZRENJANIN CHPP	-		
SREMSKA MITROVICA CHPP	Decision on the use permit for the oily water separator and the reconstruction of the existing liquid discharge treatment system (oily water), on the cadastral plot number 5933/8 c.m. Sremska Mitrovica, potes "Grad" in Sremska Mitrovica. no. case ROP-SMI-9567-IUPH-2/2022 dated April 13,2022, of the RS, AP Vojvodina, City of Sremska Mitrovica, City Administration for Urban Planning, Spatial Planning and Construction of Facilities of Sremska Mitrovica, became legally binding on April 22, 2022.	-	-

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 (36/2009-60, 10/2013-30, 26/2021-3 (law)); 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 2022.

Zrenjanin CHPP

Air quality was not measured in 2022. No air quality measurements have been carried out in Zrenjanin CHPP since 2011.

Sremska Mitrovica CHPP

No air quality measurements in 2022.

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 satcks - 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. Organizational unit CHPP Novi Sad performs independent continuous measurement of the emission of polluting substances into the air.

Periodic measurements of the emission of polluting substances into the air

Emissions of air pollutants for 2022 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 (SO_2), nitrogen oxides (NO_x), carbon monoxide (CO), and particulate matters. Since 2019, Novi Sad CHPPs has been independently performing continuous measurements of air emissions based on the Decision of the Ministry of Environmental Protection no. 353-01-00293/2019-03 dated September 19, 2019 and, in accordance with that, has not performed occasional measurements.

Table 95 summarizes the results of individual measurements of matters emissions affecting air quality for the Panonske CHPPs Branch conducted in 2022.

Table 95

PANONSKE CHPPs BRANCH		
Individual air emission measurements that impact on air quality in 2021		
Mass concentrations of substances that affect air quality (mg/Nm^3)		
Novi Sad CHPP		
Unit	**A1 (K1 и K2)**	**A2(K3)**
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(K1 и K2)**	**A2 - out of function**
Heat output	**2x250 MWth**	
Fuel	**Gas**	-
SO_2	-	-
NO_x (NO_2)	-	-
CO	-	-
Particulate matter	-	-
Sremska Mitrovica CHPP		

PANONSKE CHPPs BRANCH				
Individual air emission measurements that impact on air quality in 2021				
Mass concentrations of substances that affect air quality (mg/Nm^3)				
Unit	**A3(K3 и K4)**		**Auxilliary Boiler Room**	**Biomass boiler TEK - 405**
Heat output	**2x80 MWth**		**3x15 MWth**	**18 MWth**
Fuel	**Gas**	**Crude oil**	**Gas**	**Sunflower husk**
ELV				
SO_2			0	3,10
CO			0	66,53
NO_x (NO_2)			144,60	544,40
Particulate matter			-	7,89

Boilers 2 and 3 in Novi Sad CHPP fired natural gas during the entire 2022. In 2022, Zrenjanin CHPP started operating in June - test operation, then in October, November, and December. The generation unit – Unit 2 has not been operating since November 1, 2010.

The first periodic measurement of the emission of polluting substances into the air at Zrenjanin CHPP, after the last activity of the production block in 2012, was carried out in December on boiler K2, thermal power 250 MW in Block A1. For heating purposes of the Zrenjanin CHPP facilities, the boiler T110 is used, with heat output of 8.5 MW along with the boiler T112 with heat output of 15,60 MWt, which fired the gas during the heating season in 2022. The average heat output used to heat own facilities with gas is approximately 600 kW.

In 2022, in the Sremska Mitrovica CHPP, one boiler firing biomass TE.K – 405 (sunflower husk) operated for 2.603,01 hours, while the boiler S-2400/2 in the auxiliary boiler room fired only natural gas for 417,54 hours, unit A3 was not in operation. Steam boilers S-2400/1 and S-2400/3 fired natural gas less than 100 hours in 2022.

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, SO_2, CO, NO_2, NO_x. Data acquisition and processing equipment was also installed.

Table 96 provides an overview of data on equipment for continuous emissions measurement of matters affecting air quality in Panonske CHPPs.

Table 96

PANONSKE CHPPS BRANCH									
Continuous emission measurement equipment of units in 2022									
Organisational unit	**Particulate matters**	**Pollutants**	**Parameters**						
		Gases	**Content**			**p**	**t**	**Flow**
		SO_2, NO_x (NO_2), CO	**Humidity**	**CO_2**	**O_2**			
NOVI SAD CHPP	1 analyzer	1 analyzer each				1 gauge each		
	Measuring equipment is installed at the elevation of 38.2 m, on the external stack lining. The platform is at the elevation of 37 m, on the external stack lining. Stack height is 160 m.							
ZRENJANIN CHPP	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 m, on the external stack lining. Stack height is 160 m.							
SREMSKA MITROVICA CHPP	1 device each					1 gauge 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. The creation of a 48-hour report is intended only for Novi Sad CHPP.

Table 97 provides an overview of air emissions continuous measurements results for which ELVs for Novi Sad CHPP are set, in 2022.

Table 97

PANONSKE CHPPS BRANCH				
Continuous emissions measurements of matters affecting air quality in 2022 (mg/Nm^3), mean annual values				
Organisational unit	**Particulate matter**	**SO_2**	**CO**	**$NO_X(NO_2)$**
Novi Sad CHPP	1,21	2,2	25,8	448,9

- **Annual emissions of pollutants affecting air quality**

Table 98 provides an overview of emissions affecting air quality: particulate matters, SO_2, NO_2 and CO_2 for the Panonske CHPPs Branch in 2022. Annual particulate matter, SO_2 and NO_2 emissions were calculated based on the measured mass concentrations, flue gas flow rate and operating time of units, while CO_2 emissions were calculated based on the fuel consumption data shown in Table 99 and CEF – correction emission factor.

Table 98

PANONSKE CHPPS BRANCH				
Emission of matters affecting air quality in 2022 (t/year)				
Organisational unit	**Particulate matter**	**SO_2**	**NO_x (NO_2)**	**CO_2**
NOVI SAD CHPP				
STACK, BOTH UNITS –CONTINUOUS MEASUREMENT	3,516	3,437	1.370,572	467.793,260
TOTAL: NOVI SAD CHPP	**3,516**	**3,437**	**1.370,572**	**467.793,260**
ZRENJANIN CHPP				
UNIT A1	0,528	0,519	191,120	5.106,990
UNIT A2	0,000	0,000	0,000	0,000
TOTAL: ZRENJANIN CHPP	**0,528**	**0,519**	**191,120**	**5.106,990**
SREMSKA MITROVICA CHPP				
UNIT A3, K3/K4	0,000	0,000	0,000	0,000
S-2400/1	0,000	0,000	0,000	173,710
S-2400/2	0,000	0,006	0,581	618,490
S-2400/3	0,000	0,000	0,000	50,620
Biomass-fired boiler	0,506	0,252	40,271	166,550*
TOTAL: SREMSKA MITROVICA CHPP	**0,506**	**0,258**	**40,852**	**1.009,380**
TOTAL: PANONSKE CHPPs	**4,550**	**4,214**	**1.602,544**	**473.909,630**

* The CO_2 emission value is a result of natural gas consumption in the biomass-fired boiler.

Table 99

PANONSKE CHPPs BRANCH			
Fuel consumption in 2022			
Organisational unit	**Fuel type**		
NOVI SAD CHPP			
	Gas (kStm³/yr)	**Heavy crude oil (kt/yr)**	**Biomass (kt/yr)**
STACK, BOTH UNITS-CONTINUOUS MEASUREMENT	251.378,701	0,000	0,000
Total: NOVI SAD CHPP	**251.378,701**	**0,000**	**0,000**
ZRENJANJIN CHPP			
UNIT A1	27.443,503	0,000	0,000
UNIT A2	174,764*	0,000	0,000
Total: ZRENJANIN CHPP	**27.618,267***	**0,000**	**0,000**
SREMSKA MITROVICA CHPP			
UNIT A3, K3/K4	0,000	0,000	0,000
S-2400/1	93,349	0,000	0,000
S-2400/2	332,361	0,000	0,000
S-2400/3	27,203	0,000	0,000
Biomass-fired boiler	89,498	0,000	5.593
Total: SREMSKA MITROVICA CHPP	**542,411**	**0,000**	**5.593**
Total: PANONSKE CHPPs	**279.539,379**	**0,000**	**5.593**
*Fuel consumption for heating the personal facilities			

- **Harmonization of air emissions with EU legislation**

Sulphur dioxide

To reduce the Panonske CHPPs SO_2 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 2x15MW and 14,86MW 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 SO_2 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 NOx 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 2022 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. 30/2010-81, 93/2012-27, 101/2016-9, 95/2018-388, 95/2018-267 (other law). 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, BOD_5, 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 2022 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 Aleksndrovac 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, BOD_5, 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 2 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:

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

- Cooling water into recipient the Sava River;
- Part of the wastewater from the accelerator is joined with the wastewater from from ISTEP Company and subsequently as one discharged into the recipient ;
- Sanitary wastewater, after the treatment, 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 through a separate pipeline throught control-gauging manhole into the city industrial-sewage collector

Monitoring programme includes the following physical-chemical parameters: temperature, pH,suspended matters, COD, BOD_5; ammonia, nitrates, nitrites, total inorganic nitrogen, total phosphorus, mineral oils, sediments, electrical conductivity, dissolved oxygen, cyanides, Pb, Cu, Ni, Zn, Cr, Fe, Cd.

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

1. Wastewter 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 2022 was controlled on four occasions.

Table 100 shows analysis of wastewater, watercourse - recipient water quality data for 2022 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 100

BRANCH "PANONIAN THERMAL POWER PLANTS-HEATING PLANTS"			
The quality of waste water and receiving water in 2022			
Type of water	**Organizational part**		
	TPP HP Novi Sad	**TPP HP Zrenjanin**	**TPP HP S. Mitrovica**
Waste water	There was no overrun in 2022	I - IV quarter - non-compliance Sanitary and sewage water - there was no exceedance of LVE; Oily water - there was no exceedance of LVE. In the first and second quarters, there were no oily waters and no tests were performed; Neutralization pit - there was no exceedance of LVE.	In the first, second and fourth quarter, there was no exceedance of the LVE in the waste water samples. In the III quarter, the parameters for BOD5 in the sample of the last shaft before the discharge into the Sava River exceed the GVE.
Water receiver (recipient)	There was no overrun in 2022	Non-compliance for water class IIb I quarter Before inflow: suspended matter, BOD5, ammonium ion, nitrites, dissolved oxygen. After inflow: suspended matter, BOD5, ammonium ion, nitrites, dissolved oxygen. II quarter Before inflow: suspended matter, BOD5, ammonium ion, nitrites, dissolved oxygen. After inflow: suspended matter, BOD5, ammonium ion, nitrites, dissolved oxygen. III quarter Before inflow: BPK5 After infusion: BPK5 IV quarter Before the inflow: there was no exceedance of LVE. After infusion: there was no exceedance of LVE.	In the first quarter, the parameter for BOD5 in the Sava River does not correspond to the II class of watercourses. In the II quarter, the parameter for BOD5 in the Sava River does not correspond to the II class of watercourses. In the III quarter, the parameter for BOD5 in the Sava River does not correspond to the II class of watercourses. In the IV quarter, the parameters correspond to the II class of watercourses

- **The amount of waters**

In Table 101, an overview of the amounts of captured and released water in the organizational units of the Branch "Panonska" TPP-HP, for the year 2022, is given. The calculation of the annual quantities was made on the basis of data on the capacity and operating time of the water intake and discharge pumps and flow meters..

Table 101

BRANCH "PANONIAN THERMAL POWER PLANTS-HEATING PLANTS"								
Amounts of captured and released water in 2022 (m3/year x103)								
Organizational part	Affected waters				Discharged waste water			
	Quantities used		Allowed quantities					
	Surface	Underground	Surface	Underground	Return cooling water	Oily water	Sanitary wastewater	Others (neutralization pit and lava washing)
TPP-HP Novi Sad	67.498,472	-	87.675,382	-	66.768,456	3,269	8,049	16,750
TPP-HP Zrenjanin	653,088	-	-	-	-	1,050	1,104	10,246
TE-TO Сремска Митровица	19,692	18,004	-	*44,150	-	-	6,075	9,405
IN TOTAL: BRANCH "PANONIAN THERMAL POWER PLANT-HEAT PLANT"	**68.171,252**	**18,004**	**87.675,382**	***44,150**	**66.768,456**	**4,319**	**15,228**	**36,401**

*Data taken from the Book of records on the state of underground water reserves at the source of TPP-HP Sremska Mitrovica

- **Improvements aimed at reducing the impact of wastewater on surface and underground water**

In order to control the possible contamination of groundwater, which could occur due to the activities of production plants, during 2022, periodic controls of the quality of groundwater and determination of the level of groundwater were carried out in the Branch of the Pannonian TPP-HP. Periodic tests of physical and chemical analyzes were carried out in June and December of 2022.

TPP-HP Novi Sad

In order to reduce the impact of wastewater, it is planned to create: Conceptual solution, Justification study with Conceptual project, Study on environmental impact assessment of wastewater treatment plant TPP-HP Novi Sad. In 2022, two periodic groundwater tests were performed and it was determined that the plant's activities have no impact on groundwater.

TPP-HP Zrenjanin

In 2022, two periodic groundwater tests were performed and it was determined that the plant's activities have no impact on groundwater.

TPP-HP Sremska Mitrovica

In 2022, two periodic groundwater tests were performed and it was determined that the plant's activities have no impact on groundwater.

5.2.4. Measurement of the concentration of polluting, harmful and dangerous substances in the soil

TPP-HP Novi Sad, TPP-HP Zrenjanin and TPP-HP Sremska Mitrovica

So far, soil testing has been carried out as part of the studies: "Monitoring of soil contamination around tanks and liquid fuel transfer stations in PE EPS" and "Monitoring of the system of oil tubs and pits in PE EPS plants".

Soil testing (monitoring) by authorized laboratories is planned for 2023, 2024 and 2025, then for five years if there is no soil contamination.

TPP-HP Novi Sad

For the purposes of preparing the study: "Monitoring of the system of oil tubs and pits in the facilities of PE EPS with the aim of preventing environmental pollution - Phase I", soil and groundwater testing was carried out. A total of 8 (eight) drillings were performed and 8 (eight) composite soil samples were sampled. According to the results of physical and chemical tests, it can be concluded that the soil in the immediate vicinity of the oil tubs and pits at the TPP-HP Novi Sad location is not contaminated with arsenic and metals such as chromium, nickel, lead, copper, zinc, cadmium, mercury and cobalt, as well as organic pollutants. – mineral oils S10-S40, polychlorinated biphenyls (PCB), polycyclic aromatic hydrocarbons (PAH) and aromatic hydrocarbons (benzene, xylene, toluene and ethylbenzene).

For the purposes of preparing the study: "Monitoring of soil contamination around tanks and liquid fuel transfer stations and oil and lubricant storage in the companies of the public company "Elektroprivreda Srbije", soil and groundwater testing was performed. A total of 7 (seven) drillings were performed and 7 (seven) composite soil samples were sampled. According to the results of the physical and chemical tests, it can be concluded that the soil in the immediate vicinity of the fuel oil tank at the TPP-HP Novi Sad location is not contaminated with arsenic and the metals chromium, nickel, lead, copper, zinc, cadmium, mercury and cobalt, as well as organic pollutants - mineral oils S10-S40, polychlorinated biphenyls (PCB), polycyclic aromatic hydrocarbons (PAH) and aromatic hydrocarbons (benzene, xylene, toluene and ethylbenzene).

TPP-HP Zrenjanin

For the purposes of preparing the study: "Monitoring of the system of oil tubs and pits in the facilities of PE EPS with the aim of preventing environmental pollution - Phase I", soil and groundwater testing was carried out. In total, 3 (three) drillings were performed and 3 (three) composite soil samples were sampled, and groundwater sampling was also carried out from the wells, which confirmed the occurrence of the same. According to the results of the physical and chemical tests, it can be concluded that the soil and groundwater in the immediate vicinity of the oil tubs and pits at the TPP-HP Zrenjanin location are not contaminated with arsenic and the metals chromium, nickel, lead, copper, zinc, cadmium, mercury and cobalt, as well as organic pollutants - mineral oils S10-S40, polychlorinated biphenyls (PCB), polycyclic aromatic hydrocarbons (PAH) and aromatic hydrocarbons (benzene, xylene, toluene and ethylbenzene).

For the purposes of preparing the study: "Monitoring of soil contamination around tanks and liquid fuel transfer stations and oil and lubricant storage in companies of the public company Elektroprivreda Srbije", soil and groundwater testing was carried out. In total, 11 (eleven) boreholes were drilled and 11 (eleven) composite soil samples were sampled, and groundwater sampling was also performed from the boreholes where the occurrence of the same was noted. According to the results of the physical and chemical tests, it can be concluded that the soil and groundwater in the immediate vicinity of the fuel oil tank at the TPP-HP Zrenjanin location are not contaminated with arsenic and metals such as chromium, nickel, lead, copper, zinc, cadmium, mercury and cobalt, as well as organic pollutants. – mineral oils S10-S40, polychlorinated biphenyls (PCB), polycyclic aromatic hydrocarbons (PAH) and aromatic hydrocarbons (benzene, xylene, toluene and ethylbenzene).

TPP-HP Sremska Mitrovica

For the purposes of preparing the study: "Monitoring of the system of oil tubs and pits in the facilities of PE EPS with the aim of preventing environmental pollution - Phase I", soil and groundwater testing was carried out. In total, 2 (two) drillings were performed and 2 (two) composite soil samples were sampled. According to the results of physical and chemical tests, it can be concluded that the soil in the immediate vicinity of the oil tubs and pits at the Sremska Mitrovica TPP-HP site is not

contaminated with arsenic and metals such as chromium, nickel, lead, copper, zinc, cadmium, mercury and cobalt, as well as organic pollutants. – mineral oils S10-S40, polychlorinated biphenyls (PCB), polycyclic aromatic hydrocarbons (PAH) and aromatic hydrocarbons (benzene, xylene, toluene and ethylbenzene).

For the purposes of preparing the study: "Monitoring of soil contamination around tanks and liquid fuel transfer stations and oil and lubricant storage in companies of the public company Elektroprivreda Srbije", soil and groundwater testing was carried out. A total of 10 (ten) drillings were performed and 10 (ten) composite soil samples were sampled. According to the results of physical and chemical tests, it can be concluded that the soil from 7 (seven) wells in the immediate vicinity of the fuel oil tank at the "Sremska Mitrovica" TPP-HP location is not contaminated with arsenic and metals such as chromium, nickel, lead, copper, zinc, cadmium, mercury and cobalt, as well as organic pollutants - mineral oils S10-S40, polychlorinated biphenyls (PCB), polycyclic aromatic hydrocarbons (PAH) and aromatic hydrocarbons (benzene, xylene, toluene and ethylbenzene). Soil test results from three wells showed contamination with mineral oils, S10-S40. A repeated control test confirmed that there is no contamination.

5.2.5. Measurement of noise in the environment

Noise measurement in the environment in the "Panonska" Branch of TPP-HP in 2022 was carried out by an accredited legal entity, "Institute for Occupational Safety" a.d. Novi Sad in accordance with the Law on Protection from Noise in the Environment ("Official Head of RS", No. 96/21), Rulebook on Noise Measurement Methods, Content and Scope of Noise Measurement Reports ("Official Head of RS" , no. 72/10), the Rulebook on the conditions that must be met by the professional organization for noise measurement, as well as the documentation that is submitted with the request for authorization for noise measurement ("Sl. gl. RS", no. 72/10) and the Decree on noise indicators, threshold values, methods for evaluating noise indicators, disturbance and harmful effects of noise in the environment ("Sl. gl. RS", no. 75/2010) and the Decision on determining acoustic zones.

TPP-HP Novi Sad

At TPP-HP Novi Sad, noise in the environment was measured in December 2022.

The decision on determining acoustic zones in the territory of the city of Novi Sad "Fig. newspaper of the city of Novi Sad no. 24/2015 and 32/2017" no zoning was carried out for the area near TPP-HP Novi Sad, so the limit values of the noise level are 65 dB for the day and evening period from 6 a.m. to 10 p.m. and 55 dB for the night period from 10 p.m. to 06 hours.

TPP-HP Zrenjanin

In TPP-HP Zrenjanin noise in the environment was measured in December 2022.

On the territory of the city of Zrenjanin, no acoustic zoning of the space was carried out, based on Article 17 of the Law on Protection from Noise in the Environment ("Sl. gl. RS", No. 96/21), the highest prescribed limit values from the Regulation on Noise Indicators are applied , limit values, methods for evaluating indicators of noise, disturbance and harmful effects of noise in the environment ("Sl. gl. RS", no. 75/2010), that is, for the limit values of the noise level, 65 dB is applied for the day and evening period from 6 a.m. to 10 p.m. and 55 dB for the night period from 10 p.m. to 6 a.m.

TPP-HP Sremska Mitrovica

In TPP-HP Sremska Mitrovica, noise in the environment was measured in December 2022.

Noise measurement is planned once a year in the full working season with the Study on environmental impact assessment of the adaptation, delivery, installation work and commissioning of the biomass hot water boiler plant and the system for connecting to the existing installations TPP-HP Sremska Mitrovica on cadastral plot number 5933 /7 K.O. Sremska Mitrovica and the Study on environmental impact assessment of the treatment of waste silted water generated in the process of preparing industrial and decarbonized water on cadastral plot number 5933/8 K.O. Sremska Mitrovica. Table 102 shows the noise level in 2022.

Table 102

BRANCH "PANONIAN THERMAL POWER PLANTS-HEATING PLANTS"					
Noise level in 2022 (dB)					
	Use of the space			**For day and night**	**For night**
				35	30
Limit values of noise indicators Regulation on noise indicators, limit values, methods for evaluating noise indicators, disturbance and harmful effects of noise in the environment, "Official Gazette of the RS" no. 75/10	Rest and recreation areas, hospital zones and convalescent centers, 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-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 bordering zone	
Organizational Part	**TPP-HP Novi Sad**				
Measuring point	MM-1	MM-2	MM-3	MM-4	
For day	57,4-57,8	51,2-51,5	49,6-50,9	52,9-53,2	
For the evening	56,8-57,4	51,6-51,8	49,5-50,1	50,4-53,4	
For night	54,4-54,6	50,2-51,1	48,7-49,4	49,8-50,3	
Organizational Part	**TPP-HP Zrenjanin**				
Measuring point	MM-1	MM-2	MM-3	MM-4	
For day	55,5-57,4	55,8-56,7	63,4-64,4	60,0 – 61,7	
For the evening	53,5-55,8	52,5-53,6	62,2-63,0	59,4-60,2	
For night	54,6-54,8	54,3-54,6	62,8-63,0	59,1-59,2	
Organizational Part	**TPP-HP S. Mitrovica**				
Measuring point	MM-1	MM-2	MM-3	MM-4	
For day	50,9 – 59,9	38,6 – 43,4	38,9 – 39,5	43,2 – 51,1	
For the evening	45,1 – 46,7	36,4 – 39,1	37,4 – 39,1	38,2 – 43,2	
For night	44,6 – 45,9	36,7 – 38,3	37,2 – 38,2	39,8 – 40,2	

5.2.6. Waste

The production of waste in 2022 is shown in Table 103 according to the Legal Regulations of the Republic of Serbia in the field of waste management.

Table 103

BRANCH "PANONSKE THERMAL POWER PLANTS-HEATING PLANTS"								
Generated types of waste in 2022								
No	**Rulebook on categories, testing and classification of waste ("Official Gazette of RS" no. 56/2010, 93/2019 and 39/2021)**		**Unit**	**Organizational Part**				**Note**
				TPP-HP Novi Sad	**TPP-HP Zrenjanin**	**TPP-HP S. Mitrovica**	**In total Branch of Panonian TPP-HP**	
	Name	**Index No**		**Amounts of generated waste**				
1.	Waste printing toner other than that specified in 08 03 17	08 03 18	t	0,087	0,000	0,022	**0,109**	Waste toners for printers
2.	Boiler ash, slag and dust (except boiler dust mentioned in 10 01 04)	10 01 01	t	5,100	0,000	0,000	**5,100**	Waste ash
3.	Co-firing boiler slag and dust other than those mentioned in 10 01 14	10 01 15	t	0,000	0,000	182,500	**182,500**	Waste ash from a biomass boiler

4.	Synthetic motor oils, gear oils and lubrication	13 02 06*	t	0,340	0,000	0,000	**0,340**	Gear oil
5.	Plastic wrapping	15 01 02	t	0,000	0,000	0,040	**0,040**	Jumbo bags
6.	Mixed packaging	15 01 06	t	0,000	0,000	0,000	**0,000**	Jumbo bags
7.	Packaging that contains residues of hazardous substances or is contaminated with hazardous substances	15 01 10*	t	0,020	0,000	0,000	**0,020**	Plastic wrapping
8.	Absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing, which are contaminated with hazardous substances	15 02 02*	t	1,385	0,000	0,027	**1,412**	Waste oily absorbents-sawdust and wiping cloths/oily sand
9.	Absorbents, filter materials, wiping cloths and protective clothing other than those mentioned in 15 02 02	15 02 03	t	0,000	0,000	0,811	**0,811**	Bags from the bag filter of the biomass boiler.
10.	Scrap tires	16 01 03	t	0,000	0,000	1,770	**1,770**	
11.	Lead batteries	16 06 01*	t	7,065	0,000	0,000	**7,065**	Lead batteries
12.	Alkaline batteries (except 16 06 03)	16 06 04	t	0,000	0,000	0,000	**0,000**	Alkaline batteries
13.	Bricks	17 01 02	t	0,000	0,000	4,294	**4,294**	Fireclay from the boiler
14.	Plastic	17 02 03	t	0,000	0,000	0,065	**0,065**	
15.	Bituminous mixtures other than those mentioned in 17 03 01	17 03 02	t	0,000	0,000	0,940	**0,940**	-
16.	Aluminum	17 04 02	t	0,690	0,000	0,035	**0,725**	Aluminum sheet and window frames and insulation
17.	Zinc	17 04 04	t	2,430	0,000	0,760	**3,190**	Galvanized sheet
18.	Iron and steel	17 04 05	t	5,340	0,200	4,940	**10,480**	Various fittings; Pipes; Sheets and Valves
19.	Mixed metals	17 04 07	t	0,000	0,000	0,000	**0,000**	Mixed metals
20.	Cables other than those listed in 17 04 10	17 04 11	t	0,000	0,000	0,115	**0,115**	Copper cables with insulation
21.	Insulation material other than those listed in 17 06 01 and 17 06 03	17 06 04	t	16,550	0,000	0,220	**16,770**	Waste mineral wool
22.	Sludges from water decarbonization	19 09 03	t	144,800	0,000	4,920	**149,720**	-
23.	Saturated or spent ion exchange resins	19 09 05	t	0,000	0,000	1,910	**1,910**	Waste ionic resin
24.	Paper and cardboard	20 01 01	t	0,000	0,000	0,302	**0,302**	-

25.	Fluorescent tubes and other mercury-containing waste	20 01 21*	t	0,272	0,000	0,033	**0,305**	Waste fluorescent tubes
26.	Discarded electronic and electrical equipment containing hazardous components	20 01 35*	t	1,140	2,180	0,856	**4,176**	-
27.	Discarded electrical and electronic equipment other than that specified in 20 01 21 and 20 01 23 and 20 01 35	20 01 36	t	0,000	0,000	0,190	**0,190**	-
28.	Plastic	20 01 39	t	0,000	0,000	0,360	**0,360**	-

Note: The stated amounts of waste were determined by free estimation. The actual amount is determined when handing over the waste to authorized operators by weighing it on a scale verified by authorized organizations.

Sold/handover waste in 2022 is shown in Table 104.

Table 104

BRANCH "PANONSKE THERMAL POWER PLANTS-HEATING PLANTS"								
Sold/handover waste in 2022								
No	**Official nomenclature Rulebook on categories, testing and classification of waste ("Official Gazette of RS" no. 56/2010, 93/2019 and 39/2021)**		**Unit**	**Organizational part**				**Note**
				TPP-HP Novi Sad	**TPP-HP Zrenjanin**	**TPP-HP S. Mitrovica**	**In total Branch of Panonian TPP-HP**	
	Name	**Index No**		**Amounts of generated waste**				
1.	Waste printing toner other than that specified in 08 03 17	08 03 18	t	0,200	0,440	0,140	**0,780**	Waste toners for printers
2.	Boiler ash, slag and dust (except boiler dust mentioned in 10 01 04)	10 01 01	t	14,100	0,000	0,000	**14,100**	Waste ash
3.	Co-firing boiler slag and dust other than those mentioned in 10 01 14	10 01 15	t	0,000	0,000	182,500	**182,500**	Waste ash from a biomass boiler
4.	Non-chlorinated mineral oils, gear oils and lubrication	13 02 05*	t	0,120	0,000	0,000	**0,120**	Turbine oil
5.	Synthetic motor oils, gear oils and lubrication	13 02 06*	t	0,340	0,000	0,000	**0,340**	Gear oil
6.	Waste from liquid fuels (propellant and diesel fuel)	13 07 01*	t	0,000	0,180	0,000	**0,180**	Waste diesel fuel
7.	Plastic wrapping	15 01 02	t	0,000	0,000	0,180	**0,180**	Jumbo bags
8.	Packaging that contains residues of hazardous substances or is contaminated with hazardous substances	15 01 10*	t	0,020	0,000	0,000	**0,020**	Plastic packaging made of synthetic bioresistant concentrate for metal processing (SINT 30)

9.	Absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing, which are contaminated with hazardous substances	15 02 02*	t	1,600	0,000	0,040	**1,640**	Waste oily absorbents-sawdust and wiping cloths/oily sand
10.	Absorbents, filter materials, wiping cloths and protective clothing other than those mentioned in 15 02 02	15 02 03	t	0,000	0,000	3,080	**3,080**	Bags from the bag filter of the biomass boiler.
11.	Scrap tires	16 01 03	t	0,000	0,000	1,940	**1,940**	
12.	Discarded equipment other than that specified in 16 02 09 to 16 02 13	16 02 14	t	0,000	0,820	0,000	**0,820**	Transformer surge arresters and transformer conductive insulators (porcelain, iron)
13.	Lead batteries	16 06 01*	t	7,220	0,000	0,140	**7,360**	Lead batteries
14.	Carbon-based coatings and refractory materials from metallurgical processes other than those specified in 16 11 01)	16 11 02	t	0,000	0,100	0,000	**0,100**	Graphite
15.	Plastic	17 02 03	t	0,000	0,000	0,160	**0,160**	-
16.	Bituminous mixtures other than those mentioned in 17 03 01	17 03 02	t	0,000	0,000	0,940	**0,940**	-
17.	Copper, bronze, brass/ Plastic	17 04 01/17 02 03	t	0,000	0,060	0,000	**0,060**	Contactors - plastic/copper
18.	Aluminum	17 04 02	t	2,700	0,000	0,100	**2,800**	Aluminum sheet and window frames
19.	Zinc	17 04 04	t	2,480	0,000	0,900	**3,380**	Galvanized sheet
20.	Cables other than those specified in 17 04 10)	17 04 11	t	0,000	0,040	0,000	**0,040**	Cables
21.	Iron and steel	17 04 05	t	16,740	3,500	4,940	**25,180**	Various fittings; Pipes; Sheets and Valves
22.	Iron and steel	17 04 05	t	0,600	0,000	0,000	**0,600**	Metal shavings
23.	Mixed metal	17 04 07	t	0,820	0,000	0,000	**0,820**	--
24.	Insulation material other than those listed in 17 06 01 and 17 06 03	17 06 04	t	35,240	0,560	1,720	**37,520**	Waste mineral wool
25.	Sludges from water decarbonization	19 09 03	t	144,800	0,000	4,920	**149,720**	-
26.	Saturated or spent ion exchange resins	19 09 05	t	0,000	0,000	0,000	**0,000**	Waste ionic resin
27.	Paper and cardboard	20 01 01	t	0,000	0,000	1,120	**1,120**	-
28.	Fluorescent tubes and waste containing mercury	20 01 21*	t	0,360	0,180	0,060	**0,600**	-
29.	Plastic	20 01 39	t	0,000	0,280	0,000	**0,280**	-

30.	Discarded electronic and electrical equipment containing hazardous components	20 01 35*	t	1,640	2,300	0,880	**4,820**	-
31.	Discarded electrical and electronic equipment other than that specified in 20 01 21 and 20 01 23 and 20 01 35	20 01 36	t	0,000	0,000	0,560	**0,560**	-
32.	Plastic	20 01 39	t	0,000	0,000	0,420	**0,420**	-

5.3. Monitoring of the working environment, occupational safety and health care

Reports on occupational health and safety for 2022 include the following elements:

- **Monitoring of the working environment**
  - measurement of noise in the working environment
- **Protection at work**
  - employee training
  - work injuries
- **Health care**

5.3.1. Monitoring of the working environment

- **Measurement of noise in the working environment**

TPP-HP Novi Sad

The noise test in the working environment was not carried out in 2022.

TPP-HP Zrenjanin

The noise test in the working environment was not carried out in 2022.

TPP-HP Sremska Mitrovica

The examination of noise in the working environment in 2022 is shown in Table 105.

Table 105

BRANCH "PANONIAN THERMAL POWER PLANTS-HEATING PLANTS"			
Noise in the working environment for 2022			
Organizational part	**Plant**	**Registered noise level (dB(A))**	**Permissible noise level (dB(A))**
TPP-HP S. Mitrovica	Pump station operator's office 1	48	**70**
	Office of the head of the HTP service	44	**45**
	Filter station	74	**83**
	HTP operator's office	44	**45**
	Compressor station	84	**83**
	Shell storage	92	**85**
	Mechanical maintenance workshop	78	**83**
	Welding workshop	93	**85**
	Turning workshop	81	**83**

In places where the registered noise level is higher than allowed, employees do not spend a lot of time and protective measures are applied, the use of earplugs and antiphones.

5.3.2. Protection at work

- **Employee training**

Training for safe and healthy work - internal, general training in the field of OSH in 2022 is given in Table 106.

Table 106

BRANCH "PANONIAN THERMAL POWER PLANTS-HEATING PLANTS"		
Training of employees in 2022		
Organizational part	**No of trainees**	**Note-internal training**
Main Office	45	When changing the workplace
TPP-HP Novi Sad	150	High-risk jobs, changing jobs, and non-high-risk jobs and agencies
TPP-HP Novi Sad	240	Acquaintance of contractors and service providers with hazards and harms, health and safety measures and rules of conduct
TPP-HP Novi Sad	40	Acquaintance of students and pupils in practical classes, professional practice with dangers and harms, health and safety measures and rules of conduct
TPP-HP Zrenjanin	110	Jobs with increased risk, change of jobs, displacement due to vacancies, retirements, internal general training from OSH.
TPP-HP Zrenjanin	142	Acquaintance of contractors with hazards and harms, OSH measures and rules of conduct
TPP-HP Zrenjanin	43	Acquaintance of students and pupils in practical classes, professional practice with dangers and harms, OSH measures and rules of conduct, Acquaintance of visitors and service providers with OSH measures and rules of conduct
TPP-HP S. Mitrovica	67	Jobs with increased risk, change of jobs, displacement due to vacancies, retirements, internal general training from OSH.
TPP-HP S. Mitrovica	47	Acquaintance of contractors with hazards and harms, OSH measures and rules of conduct
TPP-HP S. Mitrovica	38	Acquaintance of visitors and service providers with OSH measures and rules of conduct

Other trainings in 2022 - external trainings are given in Table 107.

Table 107

BRANCH "PANONIAN THERMAL POWER PLANTS-HEATING PLANTS"			
Other trainings in 2022			
No	**Type of training**	**No of persons**	**Note**
1	Training for vibrodiagnostics, level I	2	PP/32000035/2021 (2193/2921) number 06.01.-15344/2-2022 dated 26/01/2022
2	Training to work in the LUNUX software package	1	According to the contract number 12.01.366822/28-2021 dated 31/12/2021
3	Training and passing the professional exam of drivers for the transport of dangerous goods (ADR)	1	In accordance with the professional development program for 2021, consent of the director from August 31, 2022
4	Improving knowledge for professional drivers	2	Mandatory periodic training for the purposes of acquiring periodic SRS
5	Basic training in the field of PPE	37	Periodic training
6	Training for vibrodiagnostics, level I	2	Proactive Novi Sad

- **Occupational Injuries**

Table 108 provides data on the number of work-related injuries in 2022.

Table 108

BRANCH "PANONIAN THERMAL POWER PLANTS-HEATING PLANTS"						
Injuries at work in 2022						
Organizational part	**Number of employees**	**Injuries in relation to the number of employees**				
		Easy	**Heavy**	**Deadly**	**Total**	**%**
Main office	36	1	0	0	1	2,78
TPP-HP Novi Sad	154	2	0	0	2	1,30
TPP-HP Zrenjanin	111	0	0	0	0	0,00
TPP-HP S. Mitrovica	67	0	0	0	0	0,00
TOTAL: "PANONIAN THERMAL POWER PLANT-HEATING" BRANCH	**368**	**3**	**0**	**0**	**3**	**0,82**

5.3.3. Health protection

Table 109 provides data on periodic examinations of employees working at workplaces with increased risk in 2022 in the Panonian TPP-HP Branch.

Table 109

BRANCH "PANONIAN THERMAL POWER PLANTS-HEATING PLANTS"											
Working ability of employees in 2022											
Organizational part	**Number of employees**	**Periodic review**				**For job**					
		Referred for review		**Checked**		**Capable**		**Limited capable**		**Incapable**	
		No	**%**	**No**	**%**	**No**	**%**	**No**	**%**	**No**	**%**
Main office	36	0	0,00	0	0,00	0	0,00	0	0,00	0	0,00
TPP-HP Novi Sad	154	132	85,71	132	100,00	49	37,12	83	62,88	0	0,00
TPP-HP Zrenjanin	111	88	79,28	88	100,00	56	63,64	32	36,36	0	0,00
TPP-HP S. Mitrovica	67	51	76,12	50	98,04	36	72,00	14	28,00	0	0,00
TOTAL: "PANONIAN THERMAL POWER PLANT-HEATING" BRANCH	**368**	**271**	**73,64**	**270**	**99,63**	**141**	**52,22**	**129**	**47,78**	**0**	**0,00**

5.4. Presentations to the public

Presentations to the public for 2022 are shown in Table 110.

Table 110

BRANCH "PANONIAN THERMAL POWER PLANTS-HEATING PLANTS"			
Presentations to the public in 2022			
Organizational part	**Objection (number. date and from whom it was submitted)**	**Object of complaint**	**Action taken**
TPP-HP Novi Sad	There were no objections from the public		
TPP-HP Zrenjanin	There were no objections from the public		
TPP-HP Sremska Mitrovica	There were no objections from the public		

6. HPP ĐERDAP 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 2022, is shown in Table 111.

Table 111

HPP ĐERDAP BRANCH			
Review and status of permits in 2022			
Facility	**Permits and approvals obtained (Number and date)**	**New requirements for obtaining or renewing valid permits**	**Note**
HPP DJERDAP 2	During 2022, the Branch of HPP "Đerdap" 2 Negotin received the following decision: - By the Decision no. 09/8/2 no. 217-15-65/2022 as of 20th May 2022 issued by MUP, SVS, Emergency Management Departement in Bor gives the consent to Accident Protection Plan to PE EPS, Branch of HPP "Đerdap", HPP "Đerdap" 2. Certified Accident Protection Plan for PE Electric Power Industry of Serbia, Branch of HPP Đerdap, HPP Đerdap 2 is an integral part of this Decision.	By the Decision on the formation of the expert committee for the preparation and formation of the request for obtaining a new license for the operation of HPP Đerdap 2 in the 41.25/39.50 mode. According to this Decision, the Expert Committee, on the basis of the expert opinion, submitted a Request for the issuance of a Water Permit in regime 41.25/39.50, no. 2460500-01.02.-698399/1-2022 dated 20th October 2022. - As part of the activities of the preparatory works for the Đerdap 2 HPP Reconstruction Project, the process of preparing the Environmental Impact Assessment Study for the Đerdap 2 HPP Reconstruction Project was initiated, and according to Contract No. 2460500-01.02.-25200/3-2022 dated 6th May 2022. On 25th January 2023 the prepared Study on Environmental Impact Assessment of the Revitalization, Modernization and Increase in Power and Efficiency of Production Aggregates of HPP Đerdap 2 was submitted to the The Negotin Municipality. The Public hearing is scheduled for 24th February 2023 at 1:00 p.m.	-

6.2. Monitoring and Environmental Impact

Environmental protection in the Branch of HPP "Đerdap" during 2022 was carried out according to defined procedures and other documents of the environmental management system (EMS).

6.2.1. Identified adverse impacts on the flow and ecological system below the reservoir

During 2022, no negative impacts on the flow and ecological system below the reservoir were registered in the facilities of the Đerdap Branch, except for the HPP Đerdap 1 and the HPP Đerdap 2, where the impacts witho no impact to the flow were registered and with no significant and proven impact to the ecological system below the reservoir.

HPP Đerdap 1:

- On 5th July 2022, an oily slick emerged on the Danube watercourse in the zone ustream of the facility, upper chamber of the navigation lock at HPP Đerdap 1 (record of inspection supervision no. 342-09-805/2022-18).

HPP Đerdap 2:

The following events were recorded during March, May, October and December 2022:

- On 29th March 2022 dissolving an oil slick on the Danube watercourse in the zone downstream of the facility, spillway gate of HPP Đerdap 2 was conducted (report no. 01.02.-192013/1-2022).

- On 24th May 2022 the slick of unkown origin emerged in the zone of all spillway bays of the spillway gate and navigation lock (report no. 01.02-310996/1-2022).

- On 20th October 2022 the rehabilitation and collection of spilled oil at the elevation of 12.25 mnm was conducted, of the Main Power Plant (report no. 01.02.-704455/1-2022).

- On 21st November 2022 dissolving of greasy slick from the Danube watercourse downstream of the Auxilliary Power Plant (report no. 2760500-01.02.-878973/1-2022).

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 2022 are given in Table 112.

Table 112

HPP DJERDAP BRANCH							
Water quantities in 2022							
Facility		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 water m^3/ year $x10^6$	Sanitary water m^3/ year $x10^3$	Total water discharged m^3/ year $x10^6$
HPP ĐERDAP 1		6	800	62.441,000	23.158,908	187,000	85.786,908
HPP ĐERDAP 1		10	422	60.220,5	90,2	126,1	99,7
HPP PIROT		2	22,5	65,358	0,086	2,440	65.444
VLASINSKE HPP	Vrla 1	4	I and II – 8,1 III and IV - 10	85,490	1,987	7,300	85,497
	Vrla 2	2	I – 8,5 II - 10	121,709	1,264	3,700	121,712
	Vrla 3	2	I – 8,4 II - 10	124,572	1,694	10,300	124,582
	Vrla 4	2	I – 8,4 II - 10	137,189	1,251	3,700	137,192
	Lisina – pumping plant	2	I – 3,6 II – 3,6	78,823	0,712	3,500	78,826

- **Water quality**

Based on contractual obligations related to surface and wastewater control, the Institute of Occupational Safety a.d. Novi Sad performed sampling of surface waters from all electric power facilities within the PE EPS, Branch of HPP "Đerdap", in four quarters in 2022.

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

- wastewater sample at the place of discharge
- surface water sample upstream of the facility
- surface water sample downstream of the faciity

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 and 1/16), 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), Decision 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 (Official Gazette of RS, No. 30/2010, 93/2012, 101/2016, 95/2018 and 95/2018 -other law). The results obtained by chemical and bacteriological analysis of surface water samples in 2022 are given in Table 113 and of waste water in Table 114.

Table 113

HPP Đerdap Brach															
Surface waters in 20212															
Facility	**Test parameters (Unit of measure)**	**Results of water quality testing in 2022**													
		1st quarter			**2nd quarter**			**3rd quarter**			**4th quarter**				**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)**
		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**	**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**	**Limit values for surface waters (II class)**	
HPP ĐERDAP 1	MPN coliform. bacteria. (E. coli/1l)	-	-	-	-	11	34	-	$1,7x10^3$	$6,3x10^2$	-	-	-	$<1 x10^4$	In the second and third quarter, on the basis of the obtained results for upstream and downstream surface waters, it can be stated that the analyzed parameters meet the II and III class of ecological potential according to: Regulation on the parameters of ecological and chemical status of surface waters and parameters of chemical status and quantitative status of groundwaters , "Official Gazette of RS", no. 74/2011. Note: the survey was not conducted in the first and fourth quarter.
	Dissolved O_2 (mg/l)	-	-	-	-	11,06	10,93	-	8,34	8,20	-	-	-	7.0	
	Suspended matter (mg/l)	-	-	-	-	<1,0	<1,0	-	<1,0	<0,1	-	-	-	25	
	HPK (mg/l)	-	-	-	-	6,2	6,0	-	6,4	7,0	-	-	-	15	
	BPK5 (mg/l)	-	-	-	-	1,65	1,50	-	1,80	2,03	-	-	-	5.0	
	pH value	-	-	-	-	8,49	8,43	-	7,77	7,88	-	-	-	6.5-8.5	
	Total oils and fats (mg/l)	-	-	-	-	<0,01	<0,01	-	<0,01	<0,01	-	-	-	-	
HPP ĐERDAP 2	MPN coliform. bacteria. (E. coli/1l)	-	19	16	-	$5,5x10^2$	$7,2x10^2$	-	-	-	-	-	-	$1 x10^4$	For samples V0224/1 and V0224/2, the tested microbiological parameters meet CLASS II-III ecological potential according to: Rulebook on parameters of ecological and chemical status of surface waters and parameters of chemical and quantitative status of underground waters, "Official Gazette of the RS", no. 74/2011 Attachment 3. Surface water samples belong to significantly altered water
	Dissolved O_2 (mg/l)	-	11,45	10,78	-	8,11	8,22	-	-	-	-	-	-	7.0	
	Suspended matter (mg/l)	-	<1,0	<1,0	-	1,20	1,60	-	-	-	-	-	-	25	
	HPK (mg/l)	-	6.53	7,02	-	7,06	7,14	-	-	-	-	-	-	15	
	BPK5 (mg/l)	-	1,84	1,97	-	1,92	2,08	-	-	-	-	-	-	5,0	

	pH value	-	8,49	8,46	-	7,97	8,09	-	-	-	-	-	-	6,5-8,5	bodies - accumulations formed on TYPE 1 water bodies. For samples V0349/1 and V0349/2, the tested microbiological parameters meet CLASS II-III ecological potential according to: Rulebook on parameters of ecological and chemical status of surface waters and parameters of chemical and quantitative status of underground waters, "Official Gazette of RS", no. 74/2011. attachment 3. Surface water samples belong to significantly altered water bodies - accumulations formed on TYPE 1 water bodies. Note: the survey was not conducted in the third and fourth quarter.
	Total oils and fats (mg/l)	-	0,003	<0,01	-	<0,01	<0,01	-	-	-	-	-	-	***	
HPP PIROT	MPN coliform. bacteria. (E. coli/1l)	-	$1.9x10^3$	$2,5x10^3$	-	$3 x10^3$	$3,2x10^2$	-	-	-	-	-	-	$5 x10^2$ -1 $x10^4$	For the sample upstream and downstream of the inlet, the tested physical and chemical parameters meet the II class according to the values stipulated in the Regulation on limit values of polluting substances in surface and underground waters and sediment and deadlines for their achievement (Official Gazette of the RS; no. 50/2012) According to the Rulebook on parameters ecological and chemical status of surface waters and parameters of chemical and quantitative RS", No. 74/2011) for chemical and physical-chemical quality elements, the sample has a good ecological status. For the sample downstream of the inlet, tested microbiological parameters satisfy CLASS II and III of ecological status according to the Rulebook on parameters of ecological and chemical status of surface waters and parameters of chemical and quantitative status of underground waters "Official Gazette of RS" No. 74/2011. Attachment 3. Surface water samples belong to TYPE 3 WATER BODIES.
	ssolved O_2 ng/l)	-	9,65	9,45	-	11,30	11,36	-	-	-	-	-	-	7.0	
	Suspended matter (mg/l)	-	<1	<1	-	<1	1,6	26,8	-	-	28,4	-	-	25	
	HPK (mg/l)	-	4,3	<4,0	-	4,7	4,2	9,30	-	-	7,3	-	-	15	
	BPK5 (mg/l)	-	1.02	1,04	-	1,08	0,94	5,02	-	-	1,59	-	-	5,0	
	pH value	-	8,02	8,02	-	8,5	8,4	0,259	-	-	7,38	-	-	5 x102 -1 x104	
	Total oils and fat (mg/l)	-	<0,01	<0,01	-	<0,01	<0,01	0,259	_	-	<0,01	-	-	6	

															In the part where the dashes are, tests were not performed.
VLASINSKE HPPs Inlet construction Vlasina Lake HPP VRLA 1	MPN coliform. bacteria. (E. coli/1l)	-	63,00	41,00	-	41,00	51,00	-	-	-	-	-	-	$5x10^2$-$1x10^4$	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 Rulebook on hazardous substances in water ("Official Gazette of SRS", No. 31/82) for class I and II. The values for dominant correspond to the II class of ecological potential. Note: the survey was not conducted in the third and fourth quarter.
	Dissolved O_2 (mg/l)	-	8,12	10.37	-	7,26	7,23	-	-	-	-	-	-	8,5	
	Suspended matter (mg/l)	-	2,80	‹1,00	-	‹1,00	1,20	-	-	-	-	-	-	25	
	HPK (mg/l)	-	‹4,00	‹4,0	-	‹4,00	6,20	-	-	-	-	-	-	10	
	BPK5 (mg/l)	-	0,76	0,78	-	0,75	1,60	-	-	-	-	-	-	1,8	
	pH value	-	6,85	7,45	-	7,45	7,47	-	-	-	-	-	-	6,5-8,5	
	Total oils and fats (mg/l)	-	‹0,01	‹0,01	-	‹0,01	‹0,01	-	-	-	-	-	-	***	
VLASINSKE HPPs HPP VRLA 2	MPN coliform. bacteria. (E. coli/1l)	-	41,00	$2x10^2$	-	51,00	84,00	-	-	-	-	-	-	$5x10^2$-$1x10^4$	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 Rulebook on hazardous substances in water ("Official Gazette of SRS", No. 31/82) for class I and II. The values for dominant correspond to the II class of ecological potential. Note: the survey was not conducted in the third and fourth quarters
	Dissolved O_2 (mg/l)	-	10.37	9,74	-	7,23	7,23	-	-	-	-	-	-	8,5	
	Suspended matter (mg/l)	-	‹1,00	5,20	-	1,20	1,60	-	-	-	-	-	-	25	
	HPK (mg/l)	-	‹4,0	‹4,0	-	6,20	9,60	-	-	-	-	-	-	10	
	BPK5 (mg/l)	-	0,78	0,74	-	1,60	1,80	-	-	-	-	-	-	1,8	
	pH value	-	7,45	7,36	-	7,47	7,54	-	-	-	-	-	-	6,5-8,5	
	Total oils and fats (mg/l)	-	‹0,01	‹0,01	-	‹0,01	‹0,01	-	-	-	-	-	-	***	
VLASINSKE HPPs HPP VRLA 3	MPN coliform. bacteria. (E. coli/1l)	-	$2x10^2$	$3x10^2$	-	84,00	$1x10^2$	-	-	-	-	-	-	$5x10^2$-$1x10^4$	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 Rulebook on hazardous substances in water ("Official Gazette of SRS", No.
	Dissolved O_2 (mg/l)	-	9,74	12,36	-	7,23	7,45	-	-	-	-	-	-	8,5	
	Suspended matter (mg/l)	-	5,20	2,40	-	1,60	1,20	-	-	-	-	-	-	25	

	HPK (mg/l)	-	‹4,00	‹4,0	-	9,60	4,00	-	-	-	-	-	-	10	31/82) for class I and II. The values for dominant correspond to the II class of ecological potential. Note: the survey was not conducted in the third and fourth quarters.
	BPK5 (mg/l)	-	0,74	0,68	-	1,80	0,72-	-	-	-	-	-	-	1,8	
	pH value	-	7,36	7,35	-	7,54	7,57	-	-	-	-	-	-	6,5-8,5	
	Total oils and fats (mg/l)	-	‹0,01	‹0,01	-	‹0,01	‹0,01	-	-	-	-	-	-	***	
VLASINSKE HPPs HPP VRLA 4	MPN coliform. bacteria. (E. coli/1l)	-	$3x10^2$	$3x10^2$	-	$1x10^2$	30,00	-	-	-	-	-	-	$5x10^2$-$1x10^4$	Based on the measured values, the tested samples meet the values defined by the Regulation on water classification ("Official Gazette of the RS", no. 5/68) for class I and meet the values defined by the Rulebook on hazardous substances in water ("Official Gazette of the SRS", No. 31/82) for class I and II. The values for dominant correspond to the II class of ecological potential. Note: the survey was not conducted in the third and fourth quarters
	Dissolved O_2 (mg/l)	-	12,36	10,54	-	7,45	7,58	-	-	-	-	-	-	8,5	
	Suspended matter (mg/l)	-	2,40	1,60	-	1,20	2,00	-	-	-	-	-	-	25	
	HPK (mg/l)	-	‹4,00	‹4,00	-	4,00	6,20	-	-	-	-	-	-	10	
	BPK5 (mg/l)	-	0,68	0,78	-	0,72-	1,40	-	-	-	-	-	-	1,8	
	pH value	-	7,35	7,37	-	7,57	7,59	-	-	-	-	-	-	6,5-8,5	
	Total oils and fats (mg/l)	-	‹0,01	‹0,01	-	‹0,01	‹0,01	-	-	-	-	-	-	***	
VLASINSKE HPPs LISINA LAKE LISINA PSPP	MPN coliform. bacteria. (E. coli/1l)	-	41,00	63,00	-	41,00	41,00	-	-	-	-	-	-	$5x10^2$-$1x10^4$	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 Rulebook on hazardous substances in water ("Official Gazette of SRS", No. 31/82) for class I and II. The values for dominant correspond to the II class of ecological potential. Note: the survey was not conducted in the third and fourth quarters.
	Dissolved O_2 (mg/l)	-	10.51	8,12	-	8,50	7,26	-	-	-	-	-	-	8,5	
	Suspended matter (mg/l)	-	‹1,00	2,80	-	‹1,00	‹1,00	-	-	-	-	-	-	25	
	HPK (mg/l)	-	‹4,00	‹4,00	-	‹4,00	‹4,00	-	-	-	-	-	-	10	
	BPK5 (mg/l)	-	0,75	0,76	-	0,50	0,75	-	-	-	-	-	-	1,8	
	pH value	-	7,33	6,85	-	7,79	7,45	-	-	-	-	-	-	6,5-8,5	
	Total oils and fats (mg/l)	-	‹0,01	‹0,01	-	‹0,01	‹0,01	-	-	-	-	-	-	***	

Table 114

HPP DJERDAP BRANCH															
Wastewater in 2022															
Facility	**Testing parameters (unit)**	**Wastewater quality testing results for 2022**													**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)**
		1st quarter			**2nd quarter**			**3rd quarter**			**4th quarter**				
		From the sewage	**Surface water upstream from the facility**	**Surface water downstream from the facility**	**From the sewage**	**Surface water upstream from the facility**	**Surface water downstream from the facility**	**From the sewage system before**	**Surface water upstream from the facility**	**Surface water downstream from the facility**	**From the sewage system before**	**Surface water upstream from the facility**	**Surface water downstream from the facility**	**Reference values for wastewater**	
HPP DJERDAP 1	MPN coliform bacteria cfu/100ml	-	-	-	-	-	-	-	-	-	-	-	-	-	Regarding the municipal wastewater sample in the third quarter, the tested parameter *biological oxygen consumption* (VRK5) does not meet the prescribed values. Regarding the sample of municipal waste water in the fourth quarter, the tested parameters meet the values prescribed by the Regulation on limit values for pollutants in surface and groundwater and sediment and deadlines for reaching them ("Official Gazette RS", no. 67/11, 48/12 and 1/16)
	Dissolved O_2 (mg/l)	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Suspended matter (mg/l)	-	-	-	-	-	-	96.0	-	-	51.18	-	-	35-60	
	HPK (mg/l)	-	-	-	-	-	-	76	-	-	23	-	-	125	
	BPK5 (mg/l)	-	-	-	-	-	-	54	-	-	3.2	-	-	25-40	
	pH value	-	-	-	-	-	-	7.51	-	-	7.88	-	-	-	
	Total oils and fats (mg/l)	-	-	-	-	-	-	0.073	-	-	<0.01	-	-	-	
HPP DJERDAP 2	MPN coliform bacteria cfu/100ml	-	-	-	-	-	-	-	-	-	-	-	-	-	Wastewater for samples V0454/1 and V0688/1; tested parameters HPK and BOD5 do not meet the values prescribed by the Regulation on limit values for pollutants in surface and groundwater and sediment and deadlines for reaching them ("Official Gazette of RS", No. 67/11,48/12,1/16) Annex 2, Chapter 3 - Municipal Wastewater. Table 2 Emission limit values for municipal wastewater discharged into the recipient.
	Dissolved O_2 (mg/l)	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Suspended matter (mg/l)	-	-	-	-	-	-	127.6	-	-	304.0	-	-	35-60	
	HPK (mg/l)	-	-	-	-	-	-	845	-	-	251	-	-	125	
	BPK5 (mg/l)	-	-	-	-	-	-	370	-	-	100	-	-	25-40	

	pH value	-	-	-	-	-	-	10.18	-	-	18.3	-	-	-	Note: Wastewater testing was not conducted in the first and second quarters
	Total oils and fats (mg/l)	-	-	-	-	-	-	6.176	-	-	0.43	-	-	-	
	Dissolved O_2 (mg/l)	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Suspended matter (mg/l)	-	-	-	-	-	-	-	-	-	-	-	-	-	
	HPK (mg/l)	-	-	-	-	-	-	-	-	-	-	-	-	-	
	BPK5 (mg/l)	-	-	-	-	-	-	-	-	-	-	-	-	-	
	pH value	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Total oils and fats (mg/l)	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Dissolved O_2 (mg/l)	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Suspended matter (mg/l)	-	-	-	-	-	-	-	-	-	-	-	-	-	
	HPK (mg/l)	-	-	-	-	-	-	-	-	-	-	-	-	-	

Note: No wastewater testing was performed at the location of Vlasinske HPP and Pirot HPP in 2022.

6.2.3. Waste

Waste management was performed according to defined procedures. The amounts of waste generated during 2022 are shown in Table 115.

Table 115

HPP DJERDAP BRANCH										
Waste types generated in 2022										
No.	**Regulation on categories, testing and classification of waste ("Official Gazette of RS" No. 56/2010, 93/2019 and 39/2021)**		**Unit**	**Facility**					**Total**	**Note**
				HPP Đerdap 1	**HPP Đerdap 2**	**HPP Pirot**	**Vlasinske HPP**	**SOP Požarevac**		
	Name	**Index**		**Amounts**						
1.	Waste toner for printing other than that specified in 08 03 17	08 03 18	t	0.450	0.000	0.017	0.050	0.000	**0.517**	Toner cartridges
2.	Non-chlorinated mineral hydraulic oils	13 01 10*	t	0.980	0.000	0.060	0.000	0.000	**1.040**	Waste hydraulic oil
3.	Non-chlorinated mineral oils for insulation and heat transfer	13 03 07*	t	0.000	0.000	0.200	0.000	0.000	**0.200**	Waste transformer oil
4.	Other emulsions	13 08 02*	t	9.700	15.99	0.300	0.000	0.000	**25.990**	Oil emulsion (mixed with adsorbents and other impurities)
	Oiled water from oil/water separator	13 05 07*	t	0.000	0.000	0.000	0.000	0.000	**0.000**	
	Fuel and diesel	13 07 01*	t	0.000	0.000	1840	0.000	0.000	**1.840**	Waste diesel fuel
5.	Mineral non-chlorinated hydraulic oils Wastes not otherwise specified	13 01 10* 13 08 99*	t	64.030	0.560	0.600	0.000	0.000	**65.190**	Waste turbine oil
				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	1.517	0.190	0.645	1.195	0.000	**3.547**	Cloths, adsorbents and contaminated with hydrocarbons
7.	Waste tires	16 01 03	t	3.343	1.09	0.203	2.520	0.000	**7.156**	Worn tires
8	Plastic	16 01 19	t	0.020	0.125	0.028	0.726	0.000	**0.899**	Waste plastic
	Plastic wrapping	15 01 02								

9.	Copper, bronze, brass	17 04 01	t	74.000	0.000	0.001	0.000	0.030	**74.031**	Copper
			t	0.000	0.000	0.000	0.000	0.000	**0.000**	Brass
			t	2.400	0.000	0.000	0.000	0.000	**2.400**	Bronze
10.	Cables other than those specified in 17 04 10	17 04 11	t	6.030	1.730	0.000	0.189	0.000	**7.949**	Copper cable
11.	Aluminum	17 04 02	t	2.490	0.000	0.000	0.000	0.000	**2.490**	Aluminum
	Colored metals	19 12 03								
12.	Iron and steel	17 04 05		105.674	0.000	0.000	0.254	0487	**106.415**	Steel sheet
				0.000	0.000	0.000	0.000	0.000	**0.000**	Stainless steel
				374.064	7.050	0.835	0.000	0.000	**381.949**	Scrap iron
				1.260	0.00	0.116	1.391	0.000	**2.767**	Metal shavings
13.	Paper and cardboard	20 01 01	t	0.165	0.000	0.000	0.000	0.000	**0.165**	Paper waste material
14.	Glass	20 01 02	t	1.800	0.000	0.000	0.018	0.000	**1.818**	Glass
15.	Fluorescent tubes and other wastes containing mercury	20 01 21*	t	0.120	0.020	0.138	0.079	0.028	**0.385**	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	0.000	0.000	8.710	0.348	0.000	**9.058**	Waste lead-acid batteries
	Lead-acid battery	16 06 01*								
17.	Discarded electrical and electronic equipment containing hazardous components	20 01 35*	t	25.581	6.188	2.344	0.744	0.258	**35.115**	Waste electrical and electronic equipment and parts
	Discarded equipment containing dangerous components other than those specified 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	0.015	0.140	0.064	0.201	0.000	**0.420**	Waste wood and plywood
19.	Wood other than that specified in 20 01 37	20 01 38	t	214.840	0.000	0.000	0.000	0.000	**214.840**	Wood waste removed from the Danube river
20.	Copper, bronze, brass, iron and steel	17 04 01 17 04 05	t	1.195	0.000	0.000	0.000	0.000	**1.195**	Waste generator coolers

21.	Insulation mterial different than those specified in 17 06 01 and 17 06 03	17 06 04	t	0.050	0.000	0.000	0.000	0.000	**0.050**	Waste mineral wool
22.	Lead-acid battery	16 06 01*	t	0.050	0.000	0.000	0.000	0.000	**0.050**	Waste batteries
				0.910	0.000	0.000	0.000	0.000	**0.910**	Waste batteries with electrolyte
23.	Insulating materials containing asbestos	17 06 01	t	0.090	0.000	0.000	0.000	0.000	**0.090**	Waste asbestos
24.	Packaging containing residues of hazardous substances or contaminated by hazardous substances	15 01 10	piece	55.000	0.000	0.000	0.000	0.000	**55.000**	Waste metal barrels
25.	Other organic solvents, washing liquids and mother liquors	07 01 04	t	0.030	0.000	0.000	0.000	0.000	**0.030**	Toluene-isopropyl alcohol solvent blend
26.	Waste adhesives and sealants containing organic solvents or other hazardous substances	08 04 09	t	0.152	0.000	0.000	0.000	0.000	**0.152**	Waste adhesives

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 as of 5 December 2010), Rulebook on categories, testing and classification of waste ("Official Gazette of RS", No. 56/10 as of 10 August 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 as of 24 December 2010), Rulebook on conditions, manner and procedure of waste oil management ("Official Gazette of RS", No. 71/10 as 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 as of 15 October 2010). Waste amounts handed over to authorized operators in 2022 are shown in Table 116.

Table 116

HPP DJERDAP BRANCH										
Collected quantities of non-hazardous waste in 2022										
No.	**Regulation on categories, testing and classification of waste ("Official Gazette of RS" No. 56/2010, 93/2019 and 39/2021)**		**Unit**	**Facility**					**Total**	**Note**
				HPP Đerdap 1	**HPP Đerdap 2**	**HPP Pirot**	**Vlasinske HPP**	**SOP Požarevac**		
	Name	**Index**		**Quantities**						
1.	Wood other than that specified in 20 01 37	20 01 38	kg	1,271,760.00	-	-	-	-	**1,271,760.00**	Wood waste removed from the Danube river

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.

6.2.5. Measurement of air emissions

Based on the legal regulation in the field of air protection (Air Protection Law, "Official Gazette of RS" No. 5/2016), the emission of polluting substances in the air from a stationary source of pollution (heating plant) intended for heating the HPP Đerdap 1 was measured. The measurements were carried out by the company Zaštita na radu i zaštita životne sredine "Beograd" doo under Contract No. 01.05.-138997-26-2022 dated 15 July 2022. Measurement results are shown in Tables 117 and 118.

Table 117

HPP DJERDAP BRANCH					
Measurement of the emission of polluting substances in the air from a stationary source of pollution - Working boiler 1					
Tested parameter	**Unit**	**Measured value**			**ELV**
		I	**II**	**III**	
Waste gas flow rate	m/s	8.10 ± 0.08	8.00 ± 0.08	7.80 ± 0.08	**-**
Volumetric flow rate	Nm^3/h	2,515.3 ± 25.2	2,456.0 ± 24.6	2,350.2 ± 23.5	**-**
Waste gas temperature	^oC	115.7 ± 1.3	117.2 ± 1.3	117.4 ± 1.3	**-**
Oxygen	%	6.20 ± 0.05	6.20 ± 0.05	5.40 ± 0.04	**-**
Carbon monoxide	Mg/Nm^3	38.8 ± 1.1	36.3 ± 1.0	36.3 ± 1.0	**170**

HPP DJERDAP BRANCH					
Measurement of the emission of polluting substances in the air from a stationary source of pollution - Working boiler 1					
Tested parameter	**Unit**	**Measured value**			**ELV**
		I	**II**	**III**	
Mass flow rate of carbon monoxide	g/h	97.5	89.1	85.2	**-**
Nitrogen oxides expressed as nitrogen dioxide	mg/Nm^3	308.0 ± 12.0	306.6 ± 12.0	302.3 ± 11.8	**350**
Mass flow rate of nitrogen oxides expressed as nitrogen dioxide	g/h	774.8	753.0	710.4	**-**
Sulfur oxides expressed as sulfur dioxide	mg/Nm^3	1,282.9 ± 62.9	1,282.9 ± 62.9	1,494.3 ± 73.2	**1,700**
Sulfur oxide mass flow rate expressed as sulfur dioxide	g/h	3,226.8	3150.7	3511.8	**-**

Table 118

HPP DJERDAP BRANCH					
Measurement of the emission of polluting substances in the air from a stationary source of pollution - Working boiler 2					
Tested parameter	**Unit**	**Measured value**			**ELV**
		I	**II**	**III**	
Waste gas flow rate	m/s	7.60 ± 0.08	7.80 ± 0.08	7.40 ± 0.07	**-**
Volumetric flow rate	Nm^3/h	2,807.8 ± 28.1	2,901.5 ± 29.0	2,719.0 ± 27.2	**-**
Waste gas temperature	^{o}C	115.7 ± 1.3	118.7 ± 1.3	119.5 ± 1.3	**-**
Oxygen	%	3.00 ± 0.02	3.89 ± 0.03	3.52 ± 0.03	**-**
Carbon monoxide	Mg/Nm^3	6.3 ± 0.2	5.0 ± 1.0	3.8 ± 1.0	**170**
Mass flow rate of carbon monoxide	g/h	17.6	14.5	10.2	**-**
Nitrogen oxides expressed as nitrogen dioxide	mg/Nm^3	314.6 ± 12.3	318.7 ± 12.4	310.9 ± 12.1	**350**
Mass flow rate of nitrogen oxides expressed as nitrogen dioxide	g/h	883.4	924.7	845.4	**-**
Sulfur oxides expressed as sulfur dioxide	mg/Nm^3	1,322.9 ± 64.8	1,602.9 ± 78.5	1,262.9 ± 61.9	**1,700**
Sulfur oxide mass flow rate expressed as sulfur dioxide	g/h	3,714.3	4650.7	3433.7	**-**

Based on the results of measurements of stationary sources of pollution, Working Boiler 1 and Working Boiler 2 are in compliance with the requirements prescribed by the Regulation on limit values for pollutants in surface and groundwater and sediment and deadlines for reaching them ("Official Gazette RS", no. 6/2016, 67/2021).

6.3. Working Environment Monitoring, Occupational Health and Safety

The 2022 Occupational Safety and Health Reports include the following elements:

- **Working Environment Monitoring**
  - working environment noise measurement.
- **Occupational Safety**

- employee training
- work injuries

- **Health protection**

6.3.1. Working Environment Monitoring

- **Working environment noise measurement**

In the organizational units of HPP Đerdap 1, HPP Đerdap 2, HPP Pirot, Vlasinske HPP, SOP Požarevac, DMR Beograd in 2022, no measurement of physical hazards in the working environment was carried out.

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 2022 were:

- Training of employees for safety and health at work.....482
- Visitor training.....428
- Fire protection training..... 307
- Training of employees with contractors (procedure O.0.IMS.0.8.5.1.0.2) 648
- Training of students in practical classes 515
- Training for safe work with work equipment.....49
- IMS training…….....138

Getting acquainted with the dangers and hazards, i.e. risk factors in the Branch of HPP Djerdap is done in accordance with the Rulebook On Occupational Safety And Health 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 119.

Table 119

HPP DJERDAP BRANCH					
Employee training in 2022					
Organizational Unit	**Number of Employees**	**To be trained**		**Trained**	
		Number	**%**	**Number**	**%**
HPP Djerdap 1	331	269	81.27	219	81.41
HPP Djerdap 2	194	194	100.00	187	96.39
HPP Pirot	37	17	45.95	17	100.00
Vlasinske HPP	95	59	62.11	59	100.00
SOP Požarevac and DMR Beograd	51	0	0.00	0	0.00
TOTAL: HPP DJERDAP BRANCH	**708**	**539**	**76.13**	**482**	**89.42**

- **Work injuries**

The number of injuries at work in 2022 is given in Table 120.

Table 120

HPP DJERDAP BRANCH						
Injuries at work in 2022						
Organizational Unit	**Number of Employees**	**Injuries in relation to the number of employees**				
		Light	**Heavy**	**Mortal**	**Total**	**%**
HPP Djerdap 1	331	2	0	0	2	0.60
HPP Djerdap 2	194	4	0	0	4	2.06
HPP Pirot	37	0	0	0	0	0.00
Vlasinske HPP	95	1	1	0	2	2.11
SOP Požarevac and DMR Beograd	51	0	0	0	0	0.00
TOTAL: HPP DJERDAP BRANCH	**708**	**7**	**1**	**0**	**8**	**1.13**

6.3.3. Health protection

During 2022, periodic medical examinations were performed for employees in the Branch of HPP Djerdap. The data are shown in Table 121.

Table 121

HPP DJERDAP BRANCH											
Working capacity of employees in 2022											
Organizational Unit	**Number of Employees**	**Periodic examination**				**For Work**					
		Sent to examination		**Examined**		**Capable**		**Limitedly capable**		**Incapable**	
		No	**%**	**No**	**%**	**No**	**%**	**No**	**%**	**No.**	**%**
HPP Djerdap 1	331	327	98.79	327	100.00	308	94.19	17	5.20	2	0.61
HPP Djerdap 2	194	184	94.85	172	93.48	171	99.42	1	0.58	0	0.00
HPP Pirot	37	36	97.30	32	88.89	32	100.00	0	0.00	0	0.00
Vlasinske HPP	95	64	67.37	60	93.75	60	100.00	0	0.00	0	0.00
SOP Požarevac and DMR Beograd	51	44	86.27	37	84.09	37	100.00	0	0.00	0	0.00
TOTAL: HPP DJERDAP BRANCH	**708**	**655**	**92.51**	**628**	**95.88**	**608**	**96.82**	**18**	**2.87**	**2**	**0.32**

6.4. Public Submissions

There were no environmental submissions from the public in 2022.

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 2022 are shown in Table 122.

Table 122

DRINSKO-LIMSKE HPPS BRANCH			
Overview and Status of Permits in 2022			
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	1. Building Permit 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 lots No. 1773/4, 2038, 2028/1, 1773/6, 1773/2 and 2028/3, all in CM Mala Reka, municipality of Bajina Bašta, class G, classification number 221210, No. ROP-BBA-45211-CPIH-2/2022 as of 23.03.2022. 2. Building Permit for construction of a water line Bjeluša – Gaj, on cadastral lots No. 190/1, 6596, 179/3, 6548/1, 385, 388/3, 342, 341/2, 340/1, 1770, 1761/5, 1763 and 1664/6, all in CM Zaovine, municipality of Bajina Bašta, category G, classification number 221210, No. ROP-BBA-6245-CPI-112022 as of 18.03.2022.	No new applications.	-

DRINSKO-LIMSKE HPPS BRANCH			
Overview and Status of Permits in 2022			
Facility	**Obtained permits and approvals (number and date)**	**Applications for obtaining new ones or extending the valid permits**	**Note**
	3. Location conditions for preparation of the Preliminary Design for "Repair of the left side of the Bajina Bašta HPP dam", on the cadastral lot No. 1378, CM Rastište, municipality of Bajina Bašta, class G, classification number 215201, No: ROP-MSGI-2514-LOC-1/2022 as of 30.05.2022 4. Location conditions for preparation of technical documents for installation of the fiber optic cable from Bajina Bašta HPP - alarm station in Perućac to the post office in Perućac, on cadastral lots No. 1439, 1424, 1421, 1470/2 and 1492, all in CM Rastište and cadastral lots No. 1056, 1048/1, 9, 1048/4, 39 and 13/1, all in CM Perućac, municipality of Bajina Bašta, category G, classification number 222431, No. ROP-BBA-3573-LOC-3/2022 as of 13.09.2022 5. Approval for execution of works for construction of the water line network at the site of Donji Sekulić, on cadastral lots No. 872/1, 869/1, 869/2 and 867, all in CM Konjska Reka, municipality of Bajina Bašta, and cadastral lots 1580/17, 1580/21 and 1580/77, all in CM Beserovina, municipality of Bajina Bašta, category G, classification number 221210, No. ROP-BBA-34238-ISAW-1/2022 as of 24.11.2022.		
Bajina Bašta PSHPP	1. Certificate of occupancy for an auxiliary facility on cadastral lot No. 2522, CM Zaovine, municipality of Bajina Bašta, category A, classification No. 124220, No. ROP-BBA-7027-IUP-9/2022 as of 19.07.2022. 2. Approval for execution of investment maintenance works on the existing facility, on cadastral lot No. 961/11, CM Rastište, municipality of Bajina Bašta, category B, classification No. 122011, No. ROP-MSGI-44240-ISAWHA-2/2022 as of 31.05.2022.	No new applications.	-
Vrelo SHPP	No new permits obtained in 2022.	No new applications.	-
ELEKTROMORAVA HPPS			
Ovčar Banja HPP	Location conditions for reconstruction of the sewage system ROP-MSGI-13405-LOCH-2/2022, reg.No. 350-02-00936/2022-07 as of 5.7.2022	Application for issuing location conditions for reconstruction of the sewage system ROP-MSGI-13405-LOCH-2/2022 as of 11.5.2022.	-

DRINSKO-LIMSKE HPPS BRANCH			
Overview and Status of Permits in 2022			
Facility	**Obtained permits and approvals (number and date)**	**Applications for obtaining new ones or extending the valid permits**	**Note**
Međuvršje HPP	No new permits obtained in 2022.	No new applications.	-
ZVORNIK HPP			
Zvornik HPP	No new permits obtained in 2022.	No new applications.	-
Radaljska Banja SHPP	No new permits obtained in 2022.	No new applications.	-
LIMSKE HPPS			
Kokin Brod HPP	Decision on approval for implementation of the change within the real estate cadastral data base (transfer of rights from EPS to EMS for using 110 kV switchyard), No. 952-02-5-144-93771/2022 as of 28.10.2022.	No new applications.	-
Uvac HPP	No new permits obtained in 2022.	No new applications.	-
Bistrica HPP	Decision on approving execution of works on investment maintenance of the power house flat roof, No. 351-05-04247/2022-07 as of 21.12.2022. Decision on approving execution of works on investment maintenance of the bridge crane within the power house, No. 351-05-04083/2022-07 as of 08.12.2022. Decision on approval for implementation of the change within the real estate cadastral data base (registration of property rights over the reservoir for raw water supply to the Bistrica HPP), No. 952-02-20-144-37502/2021 as of 15.04.2022.	No new applications.	-
Potpeć HPP	Decision on approval for implementation of the change within the real estate cadastral data base (transfer of rights from EPS to EMS for using 110 kV switchyard), No. 952-02-5-146-93734/2022 as of 04.10.2022.	No new applications.	-
Miscellaneous	Decision on approving execution of works on investment maintenance of Potpeć-Bistrica auxiliary power supply 35 kV OHTL, No. 351-05-00977/2022-07 as of 12.04.2022. Conclusion by the Government of the Republic of Serbia on declaring the Bistrica HPP Project as a project of national importance for the Republic of Serbia, No. 351-11401/2021-2 as of 28.07.2022.	Application for changing a legal status of the facility on the cad.lot 964 CM Nova Varoš, No. 2460500-E.02.02.-346732/1-2022 as of 06.06.2022	-

7.2. Monitoring and Environmental Impact

In 2022, Drinsko – Limske HPPs Branch had the first audit according to the requirements of the ISO standard 14001: 2015. The audit was performed between 12th and 14th December 2022. 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 15th – 16th December 2022, the re-sertification audit *EnMS – Energy management system ISO 50001:2018 (Energy efficiency)* was performed.

The successful audit was performed by Bureau Vetritas France.

7.2.1. Identified Negative Impact on the Flow and Ecological System Downstream from the Reservoir

The identified negative impacts in the flows downstream from 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 2022 are provided in Table 123.

Table 123

DRINSKO-LIMSKE HPPS BRANCH							
Water amounts in 2022							
Facility		**No. of units**	**Permitted water amounts (Installed discharge per unit) m^3/s**	**Discharged water amounts**			
				Water used for electricity generation in 2022 $m^3/year \times 10^6$	**Process water $m^3/year \times 10^6$**	**Sanitary water $m^3/year \times 10^3$**	**Total discharged water $m^3/year \times 10^6$**
BAJINA BAŠTA HPP		4	175	8.504	0,000	20,195	8.984
BAJINA BAŠTA PSHPP		2	55	480	0,000	0,000	0,000
Vrelo SHPP		1	0,74	0,000	0,000	0,000	0,000
ZVORNIK HPP		4	170	9.560	0,161	2,12	9.560,16
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	665,762	0,0098	0,000	665,7718
	Ovčar Banja HPP	2	I-19,5 II-30	636,576	0,0058	0,000	636,5818
LIMSKE HPPS	**Uvac HPP**	1	43	188,770	0,212	0,2	188,982
	Kokin Brod HPP	2	18,7	260,726	1,029	0,2	261,755
	Bistrica HPP	2	18	281,921	1,597	0,3	283,518
	Potpeć HPP	3	55	2.045,317	4,371	0,3	2.049,688

- **Water quality**

Pursuant to the contractual obligations regarding the control management of wastewater and surface water from the riverflows and reservoirs, the Occupational Safety Institute JSC in 2022 conducted the sampling of waste and surface waters from all power plants operating within the Drinsko – Limske HPPs Branch.

The sampling was done for two quarters of year 2022. 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 SRS № 31/1982), Water Classification Regulation and Watercourse Categorisation Regulation (OG SRS № 5/1968). The wastewater and surface water quality test results are presented in Table 124.

Table 124

DRINSKO – LIMSKE HPPs BRANCH															
Water quality in 2022															
Facility	**Testing parameters** (unit)	**Wastewater and surface water quality testing results for 2022**												**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)**
		1st quarter			**2nd quarter**			**3rd quarter**			**4th 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)	-	-	-	-	-	-	-	$2,4x10^2$	$2,6x10^2$	-	$2x10^3$	$1,7x10^3$	-	The Drina River belongs to Class II. The tested parameters meet the values defined by the Regulation.
	Dissolved O_2 (mg/l)	-	-	-	-	-	-	5,71	8,93	8,33	6,55	11,15	11,04	min. 7,0	
	Suspended substances (mg/l)	-	-	-	-	-	-	8,0	0,4	0,4	4,0	<1	<1	25	
	COD (mg/l)	-	-	-	-	-	-	11	<4,0	<4,0	32,1	<4,0	<4,0	15	
	BOD_5 (mg/l)	-	-	-	-	-	-	7	<0,5	<0,5	8,6	0,85	<0,5	5	
	pH value	-	-	-	-	-	-	8,39	8,28	8,39	7,81	8,22	8,20	6,8-8,5	
	Total oil and grease (mg/l)	-	-	-	-	-	-	-	-	-	-	-	-	-	
ZVORNIK HPP	MPN coliform bacteria (E.coli/100 ml)	-	-	-	-	-	-	-	$2,2x10^2$	$9,4x10^2$	-	$1,4x10^4$	$1,3x10^4$	-	The Drina River belongs to Class II. The tested parameters meet the values defined by the Regulation.
	Dissolved O_2 (mg/l)	-	-	-	-	-	-	-	8,91	9,73	-	10,96	11,01	min. 7,0	
	Suspended substances (mg/l)	-	-	-	-	-	-	-	0,40	0,40	-	1,60	2,0	25	
	COD (mg/l)	-	-	-	-	-	-	-	<4	<4	-	<4	<4	15	

DRINSKO – LIMSKE HPPs BRANCH															
Water quality in 2022															
Facility	**Testing parameters** (unit)	**Wastewater and surface water quality testing results for 2022**													
		1st quarter			**2nd quarter**			**3rd quarter**			**4th quarter**			**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)**
		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		
	BOD_5 (mg/l)	-	-	-	-	-	-	-	0,86	072	-	0,80	0,75	5	
	pH value	-	-	-	-	-	-	-	8,54	9,13	-	8,30	8,21	6,8-8,5	
	Total oil and grease (mg/l)	-	-	-	-	-	-	-	-	-	-	-	-	-	
OVČAR BANJA HPP	MPN coliform bacteria (E.coli/100 ml)	-	-	-	-	-	-	-	$3,7x10^3$	$4,1 x10^3$	-	$1,3x10^4$	$1 x10^4$	-	The Zapadna Morava belongs to Class II. The tested parameters meet the values defined by the Regulation.
	Dissolved O_2 (mg/l)	-	-	-	-	-	-	-	8,82	8,56	-	10,91	11,1	min. 7,0	
	Suspended substances (mg/l)	-	-	-	-	-	-	-	6,40	9,60	-	2,40	2	25	
	COD (mg/l)	-	-	-	-	-	-	-	3,78	4,50	-	5	6,8	15	
	BOD_5 (mg/l)	-	-	-	-	-	-	-	0,80	0,90	-	0,86	1	5	
	pH value	-	-	-	-	-	-	-	7,99	7,97	-	8,35	8,34	6,8-8,5	
	Total oil and grease (mg/l)	-	-	-	-	-	-	-	-	-	-	-	-	-	
MEĐUVRŠJE HPP	MPN coliform bacteria (E.coli/100 ml)	-	-	-	-	-	-	-	$6,3 x10^3$	$7,6 x10^3$		$4,5 x10^3$	$1,7 x10^4$	-	The Zapadna Morava belongs to Class II. The tested parameters

DRINSKO – LIMSKE HPPs BRANCH															
Water quality in 2022															
Facility	**Testing parameters** (unit)	**Wastewater and surface water quality testing results for 2022**												**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)**
		1st quarter			**2nd quarter**			**3rd quarter**			**4th 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		
	Dissolved O_2 (mg/l)	-	-	-	-	-	-	-	7,10	7,55	-	8,39	8,52	min. 7,0	meet the values defined by the Regulation.
	Suspended substances (mg/l)	-	-	-	-	-	-	-	0,40	20,4	-	4,0	1,20	25	
	COD (mg/l)	-	-	-	-	-	-	-	3,0	4,8	-	4,5	4,2	15	
	BOD_5 (mg/l)	-	-	-	-	-	-	-	0,50	0,60	-	0,75	0,68	5	
	pH value	-	-	-	-	-	-	-	7,57	7,52	-	8,18	8,16	6,8-8,5	
	Total oil and grease (mg/l)	-	-	-	-	-	-	-	-	-	-	-	-	-	
UVAC HPP	MPN coliform bacteria (E.coli/100 ml)	-	-	-	-	-	-	-	70	78	-	$1x10^2$	$5,9x10^2$	-	The Uvac River belongs to Class II. The tested parameters meet the values defined by the Regulation.
	Dissolved O_2 (mg/l)	-	-	-	-	-	-	-	6,80	6,72	-	10,13	9,99	min. 7,0	
	Suspended substances (mg/l)	-	-	-	-	-	-	-	0,40	0,40	-	<1	6,80	25	
	COD (mg/l)	-	-	-	-	-	-	-	<4,0	4,2	-	<4,0	<4	15	

DRINSKO – LIMSKE HPPs BRANCH															
Water quality in 2022															
Facility	**Testing parameters** (unit)	**Wastewater and surface water quality testing results for 2022**												**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)**
		1st quarter			**2nd quarter**			**3rd quarter**			**4th 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		
	BOD_5 (mg/l)	-	-	-	-	-	-	-	0,68	0,70	-	0,80	0,82	5	
	pH value	-	-	-	-	-	-	-	8,10	8,03	-	8,21	8,44	6,8-8,5	
	Total oil and grease (mg/l)	-	-	-	-	-	-	-	-	-	-	-	-	-	
KOKIN BROD HPP	MPN coliform bacteria (E.coli/100 ml)	-	-	-	-	-	-	-	79	$1,1x10^2$	-	$1,1x10^4$	$2,6x10^3$	-	The Uvac River belongs to Class II. The tested parameters meet the values defined by the Regulation.
	Dissolved O_2 (mg/l)	-	-	-	-	-	-	-	9,16	6,61	-	10,98	10,38	min. 7,0	
	Suspended substances (mg/l)	-	-	-	-	-	-	-	6,80	0,80	-	1,20	<1	25	
	COD (mg/l)	-	-	-	-	-	-	-	<4,0	<4,0	-	<4,0	<4,0	15	
	BOD_5 (mg/l)	-	-	-	-	-	-	-	0,66	0,76	-	0,80	0,86	5	
	pH value	-	-	-	-	-	-	-	8,40	7,96	-	8,66	8,35	6,8-8,5	
	Total oil and grease (mg/l)	-	-	-	-	-	-	-	-	-	-	-	-	-	
BISTRICA HPP	MPN coliform bacteria (E.coli/100 ml)	-	-	-	-	-	-	-	94	$1,4x10^2$	-	<1	$4x10^2$	-	The Uvac River belongs to Class II. The tested parameters of the suspended substances downstream from the facility in the
	Dissolved O_2 (mg/l)	-	-	-	-	-	-	-	9,42	8,79	-	9,67	10,81	min. 7,0	

DRINSKO – LIMSKE HPPs BRANCH															
Water quality in 2022															
Facility	**Testing parameters** (unit)	**Wastewater and surface water quality testing results for 2022**												**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)**
		1st quarter			**2nd quarter**			**3rd quarter**			**4th 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		
	Suspended substances (mg/l)	-	-	-	-	-	-	-	0,40	0,40	-	<1	58,40	25	fourth quarter do not meet the values defined by the Regulation.
	COD (mg/l)	-	-	-	-	-	-	-	4,6	4,7	-	4,5	4,0	15	
	BOD_5 (mg/l)	-	-	-	-	-	-	-	0,90	1,2	-	0,82	1,0	5	
	pH value	-	-	-	-	-	-	-	8,38	8,18	-	8,23	8,35	6,8-8,5	
	Total oil and grease (mg/l)	-	-	-	-	-	-	-	-	-	-	-	-	-	
POTPEĆ HPP	MPN coliform bacteria (E.coli/100 ml)	-	-	-	-	-	-	-	$6,2x10^3$	$8,9x10^3$	-	$2,4 x10^4$	$9,1x10^3$	-	The Lim River belongs to Class II. The tested parameters of the suspended substances in the fourth quarter do not meet the values defined by the Regulation.
	Dissolved O_2 (mg/l)	-	-	-	-	-	-	-	7,97	8,82	-	10,99	11,02	min. 7,0	
	Suspended substances (mg/l)	-	-	-	-	-	-	-	7,60	12,8	-	43,60	40,80	25	
	COD (mg/l)	-	-	-	-	-	-	-	5	4,85	-	4,10	4,50	15	
	BOD_5 (mg/l)	-	-	-	-	-	-	-	0,80	0,80	-	0,90	0,95	5	
	pH value	-	-	-	-	-	-	-	7,90	7,93	-	8,54	8,46	6,8-8,5	

DRINSKO – LIMSKE HPPs BRANCH															
Water quality in 2022															
Facility	**Testing parameters** (unit)	**Wastewater and surface water quality testing results for 2022**													
		1st quarter			**2nd quarter**			**3rd quarter**			**4th quarter**			**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)**
		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)	-	-	-	-			-	-	-	-	-	-	-	

Water quality control for Vrelo SHPP was not carried out in the Drinsko-Limske HPPs Branch, since for its size and structure it does not produce waste water.
Waste water was tested in Radaljska Banja SHPP. The tested parameters meet the values defined by the Regulation.

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 2022 is shown in the Table 125.

Table 125

DRINSKO-LIMSKE HPPS BRANCH Generated waste types in 2022									
No.	Regulation on categories, testing and classification of waste (OG RS № 56/2010, 93/2019 and 39/2021)		Unit (t)	Објекат				Total	Note
				Bajina Bašta HPP and PSHPP	LIMSKE HPPs	Elektromorava HPP	Zvornik HPP		
	Name	Index number		Amounts					
1.	Lead batteries	16 06 01*	t	0,000	4,300	0,000	0,000	**4,300**	Lead batteries
2.	Fluorescent tubes and other waste containing mercury	20 01 21*		0,000	0,000	0,507	0,000	**0,507**	Fluorescent tubes
3.	Discarded equipment other than the one indicated under 20 01 21 and 20 01 23 containing hazardous components	20 01 35*	t	0,000	0,000	2,088	0,000	**2,088**	Electric 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 facilities area and delivered to the authorized companies registered for such activity. The delivered waste in 2022 is shown in the Table 126.

Table 126

DRINSKO – LIMSKE HPPS BRANCH									
Delivered waste in 2022									
No.	Regulation on categories, testing and classification of waste OG RS № 56*//2010, 93/2019 and 39/2021)*		Unit (t)	Објекат				Total	Note
				Bajina Bašta HPP and PSHPP	Limske HPPs	Elektromorava HPP	Zvornik HPP		
	Name	Index number		Amounts					
1.	Lead batteries	16 06 01*	t	0,000	4,300	0,000	0,000	**4,300**	Lead batteries
2.	Fluorescent tubes and other waste containing mercury	20 01 21*	t	0,000	0,000	0,507	0,000	**0,507**	Fluorescent tubes
3.	Discarded equipment other than the one indicated under 20 01 21 and 20 01 23 containing hazardous components	20 01 35*	t	0,000	0,000	2,088	0,000	**2,088**	Electric waste hazardous

7.2.4. Environmental Noise Measurement

Environmental noise measurements nearby the electric power facilities were not performed in 2022, 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 2022 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 microlimate parameters, noise measurements in the working environement were executed in all Drinsko-Limske HPPs facilities, during regular periodic inspections for winter 2022.

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 127.

Table 127

DRINSKO – LIMSKE HPPS BRANCH					
Working environment noise in 2022					
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 PSHPP		FP TARA Pump plant	82	80
			PP DJURICI – Pump drive	98	85
			Generator area	89	85
			Turbine area	89	85
			Compressor station	88	85
			Ball valve	91	85
	Zvornik HPP		Production plant – turbine area, at Turbine 3 entrance	118	85
			Production plant right bank – turbine area, cooling system	113	85
			Production plant – turbine area, Turbine 2 entrance	107	85
			Production plant, left bank – turbine area, cooling system	104	85
	EMHPPs	Ovčar Banja HPP	Turbine area	90	85
			Mechanical workshop	90	85
			Control room	62	60
		Medjuvršje HPP	Power house	87	85
			Turbine area B 1 between turbines	95	85
			B 3 auxiliary generator	98	85
Lim HPP	Kokin Brod HPP		Turbine A area	96	85
			Turbine B area	95	85
	Uvac HPP		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
			Turbine area	95	85
			Machining workshop	95	85
			Carpenter workshop	94	85
	Potpeć HPP		Power house	88	85
			Turbine area	95	85
			Busbars distribution area	87	85

At locations where the noise level was higher than the admissible, the employees do not spend much time and protective measures are applied, using earmuffs and antiphones there.

7.3.2. Occupational Safety

- **Training of employees**

Employee training has been conducted under the Training program and improving 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 128.

Table 128

DRINSKO – LIMSKE HPPS BRANCH					
Training of employees in 2022					
Facility	**Number of employees**	**For training**		**Trained**	
		No.	**%**	**No.**	**%**
Bajina Bašta HPP **Bajina Bašta PSHPP**	214	61	28,50	61	100,00
Elektromorava HPP	45	45	100,00	44	97,78
Zvornik HPP	58	23	39,66	23	100,00
Limske HPPs	110	35	31,82	35	100,00
TOTAL: DRINSKO – LIMSKE HPPS BRANCH	**427**	**164**	**38,41**	**163**	**99,39**

Table 129 gives numbers of individuals sent for other trainings.

Table 129

DRINSKO – LIMSKE HPPS BRANCH			
Other trainings in 2022			
No.	**Type of training**	**Number of persons**	**Note**
1.	Introducing the contractors with the dangers and hazards, OSH measures and rules of conduct	BBHPP/175 LHPP/85 ZVHPP/33 EMHPP/12 **TOTAL: 305**	-
2.	Training for OSH of workers engaged in auxiliary overhaul works	BBHPP/74 LHPP/68 ZVHPP/14 EMHPP/0 **TOTAL: 156**	-
3.	Introducing the students and pupils at practice with OSH measures and rules of conduct	BBHPP/16 LHPP/29 ZVHPP/0 EMHPP/80 **TOTAL: 125**	-
4.	Training of employees in case of change of workplace	BBHPP/0 LHPP/0 ZVHPP/1 EMHPP/1 **TOTAL: 2**	-
5.	Fire protection trainings	BBHPP/0 LHPP/0 ZVHPP/22 EMHPP/38 **TOTAL: 60**	

- **Work injuries**

Table 130 provides number data occupational injuries in 2022.

Table 130

DRINSKO – LIMSKE HPPS BRANCH						
Occupational injuries in 2022						
Facility	**Number of employees**	**Injuries in relation to the number of employees**				
		Light	**Severe**	**Fatal**	**Total**	**%**
Bajina Bašta HPP	214	2	1	0	3	1,40
Bajina Bašta RHPP						
Elektromorava HPP	45	0	0	0	0	0,00
Zvornik HPP	58	1	0	0	1	1,72
Limske HPPs	110	0	0	0	0	0,00
TOTAL: DRINSKO – LIMSKE HPPS BRANCH	**427**	**3**	**1**	**0**	**4**	**0,94**

7.3.3. Health Protection

Medical examinations results are provided in Table 131.

Table 131

DRINSKO – LIMSKE HPPS BRANCH											
Work ability of employees in 2022											
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	214	181	84,58	160	88,40	143	89,38	17	10,63	0	0,00
Bajina Bašta RHPP											
Elektromorava HPP	45	6	13,33	6	100,00	6	100,00	0	0,00	0	0,00
Zvornik HPP	58	10	17,24	10	100,00	8	80,00	2	20,00	0	0,00
Limske HPPs	110	35	31,82	35	100,00	29	82,86	6	17,14	0	0,00
TOTAL: DRINSKO – LIMSKE HPPS BRANCH	**427**	**232**	**54,33**	**211**	**90,95**	**186**	**88,15**	**25**	**11,85**	**0**	**0,00**

7.4. Public Submissions

Public submissions 2022 are provided in Table 132.

Table 132

DRINSKO – LIMSKE HPPS BRANCH		
Public complaints in 2022		
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 2022:

- Sicevo HPP
- Sokolovica HPP
- Gamzigrad HPP
- Prvonek HPP
- Raška HPP
- Turica HPP

Small hydropower plants out of operation in 2022:

- Seljašnica HPP
- Sveta Petka HPP
- Moravica HPP
- Pod gradom HPP
- Kratovska reka HPP
- Temac HPP
- Vučje HPP
- Jelašnica HPP

According to the plans of PE EPS, Gamzigrad HPP is exempt from reconstruction (restitution proceedings initiated), small hydropower plants that are out of service, are at different stages of reconstruction or rehabilitation.

Small HPPs under constructin:

- Rovni HPP, construction has begun, works in progress;
- Ćelije HPP, works have not begun, Building Permit obtained and Notice on Commencement of Works placed, Design for Execution prepared, coordination with the contractor.

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 20, 2020, by Municipal Administration of Prijepolje.

Kratovska reka HPP, in the process of obtaining the Use Permit, as-built design is being prepared, reconstruction carried out under the existing BP from 1985.

8.2. Monitoring and Environmental Impact

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

The identified negative impacts in streams downstream the dams are mainly twofold: with very low water level (low flow rate), 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 generation.

8.2.2. Water

- **Water quantity**

Utilisation of water for hydropower generation, process and sanitary water was in accordance with the needs and technical features of the units. Amounts of used water are calculated on an approximative basis according to the energy generation and are provided in Table 133 per power plant.

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 power plants.

Table 133

RENEWABLE ENERGY SOURCES BRANCH						
Water amounts in 2022						
Organizational unit	**Installed power kW**	**Permitted water amount (installed flow per unit) m^3/s**	**Discharged water amounts**			
			Water used for electricity generation in 2022 $m^3/y.x10^6$	**Technical water $m^3/y.x10^6$**	**Sanitary water $m^3/y.x10^3$**	**Total discharged water $m^3/y.x10^6$**
Raška HPP	4,600	4.50	-			
Seljašnica HPP	1,040	0.80	In reconstruction			
Moravica HPP	750	2.50	In reconstruction			
Turica HPP	376	3.20	-			
Pod Gradom HPP	364	2.30	In reconstruction			
Kratovska Reka HPP	760	1.16	In reconstruction			
Sveta Petka HPP	744	-	In reconstruction			
Sićevo HPP	1,348	20.60	174,432	-	-	-
Temac HPP	904	6.10	In reconstruction			
Sokolovica HPP	3,724	40.00	420,864	-	-	-
Gamzigrad HPP	224	4.20	49,858	-	-	-
Vučje HPP	1,986	1.25	In reconstruction			
Jelašnica HPP	540	0.42	In reconstruction			
Prvonek HPP	932	1.45	-			

- **Water quality**

During 2022, water quality control was not carried out in the Renewable Energy Sources Branch. SHHPs in the RES Branch for their size and structure are not able to produce waste water. Measurements of technical and sanitary waters are not performed at our HPPs.

8.2.3. Waste

During 2022, 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 further 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 the legislation.

8.2.4. Environmental Noise Measurement

Noise level in the environment near the hydropower facilities operated by the RES Branch was not measured in 2022, because the facilities are dislocated from the settlement.

8.3. Working Environment Monitoring, Occupational Health and Safety

Occupational Safety and Health Protection Reports in 2022 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**

In 2022, noise measurement in the working environment was made and the measured values were within the permitted limits.

8.3.2. Occupational Safety

- **Training of employees**

Employee training, which was done, is training of 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 - 35 employees.

- **Occupational injuries**

In Table 134 are given data on number of occupational injuries in 2022.

Table 134

RENEWABLE ENERGY SOURCES BRANCH						
Occupational injuries in 2022						
Organizational unit	**Number of employees**	**Injuries in relation to the number of employees**				
		Light	**Severe**	**Fatal**	**Total**	**%**
Renewable Energy Sources	55	0	1	0	0	0.00
TOTAL: RENEWABLE ENERGY SOURCES BRANCH	**55**	**0**	**1**	**0**	**0**	**0.00**

8.3.3.Health Protection

In Table 135 are given data on medical examinations.

Table 135

RENEWABLE ENERGY SOURCES BRANCH											
Work ability of employees in 2022											
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	12	10	83.33	10	100.00	9	90.00	0	0.00	1	10.00
TOTAL: RENEWABLE ENERGY SOURCES BRANCH	**55**	**37**	**67.27**	**37**	**100.00**	**36**	**97.30**	**0**	**0.00**	**1**	**2.70**

8.4. Public Submissions

There were no public complaints regarding environment in 2022.

9. PE EPS HQ

9.1. Working Environment Monitoring, Occupational Health and Safety

The 2022 Occupational Safety and Health Protection Reports include the following elements:

- **Working environment monitoring**

  - Working environment noise measurements

- **Occupational Safety**

  - Employees training
  - Work injuries

- **Health Protection**

9.1.1. Working Environment Monitoring

- **Working environment noise measurements**

There were no noise measurements within this year.

9.1.2. Occupational Safety

- **Employees training**

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

- Occupational Health and Safety training of employees – 700 employees.

- **Occupational injuries**

The number of occupational injuries that occurred in 2022 is presented in Table 136.

Table 136

PE EPS HQ						
Occupational injuries in 2022						
Organisational unit	**Number of employees**	**Injuries in relation to the number of employees**				
		Light	**Severe**	**Fatal**	**Total**	**%**
PE EPS HQ	780	8	1	0	9	1.15
TOTAL: PE EPS HQ	**780**	**8**	**1**	**0**	**9**	**1.15**

9.1.3. Health Protection

There are no employees in PE EPS HQ working in high-risk workplaces. Annual medical examinations of employees and mandatory vision screenings were done in 2022.

9.2. Public Submissions

There were no public complaints regarding environment in 2022.

10. EPS SNABDEVANJE BRANCH

10.1. Working Environment Monitoring, Occupational Health and Safety

The 2022 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 2022 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 2022:

- Training of employees for safety and health at work, in accordance with Programme of training for safety and health at work and PE EPS: 1.148
- Basic training regarding fire protection in accordance with Programme of basic training of employees regarding fire protection: 1.142
- Informing the employees about risks, dangers and hazards and measures of safety and health at work, in accordance with Rulebook on Occupational Health and Safety and Risk Assessment Act: 775

- **Work injuries**

The number of work injuries that occured in 2022 is presented in Table 137.

Table 137

EPS SNABDEVANJE BRANCH						
Occupational injuries in 2022						
Organizational unit	Number of employees	Injuries in relation to the number of employees				
		Minor	Severe	Fatal	Total	%
TOTAL: EPS SNABDEVANJE BRANCH	1.239	13	0	0	13	1,05

10.1.3. Health Protection

In EPS Snabdevanje Branch there are no employees working on high-risk posts. Periodical medical examinations of employees and mandatory eye examinations are planned and organized for year 2023.

10.2. Public Submissions

There were no public submissions regarding environment in 2022.

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.

Electric power generation 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 to 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 and 115/2021)

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. Law on Energetics ("Official Gazette of RS", No. 145/2014, 95/2018 – other law and 40/2021)
4. Law on Environmental Impact Assessment ("Official Gazette of RS", No. 135/04 and 36/2009)
5. Law on Strategic Environmental Assessment ("Official Gazette of RS", No. 135/2004 and 88/2010)
6. Law on Integrated Prevention and Control of Environmental Pollution ("Official Gazette of RS", No. 135/2004 and 25/2015 and 109/2021)
7. Law on Air Protection ("Official Gazette of RS", No. 36/2009 and 10/2013 and 26/2021 and other law)
8. Law on Environmental Noise Protection ("Official Gazette of RS", No. 96/2021)
9. Law on Protection against Non-Ionizing Radiation ("Official Gazette of RS", No. 36/2009)
10. Law on Land Protection ("Official Gazette of RS", No. 112/2015)
11. Law on Packaging and Packaging Waste ("Official Gazette of RS", No. 36/2009 and 95/2018 - other law)
12. Law on Climate Changes ("Official Gazette of RS", No 26/2021)
13. Law on Biocidal Products ("Official Gazette of RS", No. 109/2021)
14. Law on Chemicals ("Official Gazette of RS", No. 36/2009, 88/2010, 92/2011 and 93/2012 and 25/2015)
15. Law on Waste Management ("Official Gazette of RS", No. 36/2009, 88/2010, 14/2016 and 95/2018 - other law)
16. Law on Waters ("Official Gazette of RS", No. 30/2010, 93/2012, 101/2016, 95/2018 and 95/2018 - other law)
17. Law on Meteorology ("Official Gazette of RS", No. 15/2016)
18. Law on Meteorological and Hydrological Activities ("Official Gazette of RS", No. 88/2010)
19. Law on Protection and Sustainable Use of Fish Stock ("Official Gazette of RS", No. 128/2014 and 95/2018 - other law)
20. Law on Mining and Geological Research ("Official Gazette of RS", No. 101/2015 and 95/2018 - other law 40/2021)
21. 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)
22. 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)
23. Law on Forests ("Official Gazette of RS", No. 30/2010, 93/2012, 89/2015 and 95/2018 - 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, 156/2020 – harmonized din. Amounts 15/2021 – Amendment of harmonized din. Amounts)
25. Law on Standardization ("Official Gazette of RS", No. 36/2009 and 46/2015).

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 determining activities which have impact to environment (("Official Gazette of RS", No. 109/2009 and 8/2010)
3. Decree on determining criteria for assessment of jeopardized environment status and priorities for repair and remedy ("Official Gazette of RS", No. 22/2010)
4. Decree on putting under control use and trading 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 regulation)
5. Decree on contents and recording of environmental information system, methodology, structure, mutual basis, categories and levels of data collecting, as well as contents of information which shall be regularly and mandatory presented to public ("Official Gazette of RS", No. 112/2009)
6. Decree on terms which shall be fulfilled by users of funds, terms and manner of funds allocation, manner of funds use supervision and contract rights and obligations, as well as other issues which are important for awarding and use of Green fund ("Official Gazette of RS", No. 25/2018)
7. Decree on conditions for monitoring and air quality requirements ("Official Gazette of RS", No. 11/2010, 75/2010 and 63/2013)
8. Decree on limit values of emissions of pollutants into the air from combustion plants ("Official Gazette of RS, No. 6/2016 and 67/2021)
9. 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)
10. Decree on measurements of emissions of pollutants into the air from stationary sources of pollution ("Official Gazette of RS", No. 5/2016)
11. Decree on the methodology for the preparation of the inventory of emissions and projections of air pollutants ("Official Gazette of RS", No. 3/2016)
12. 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)
13. Decree on Determining the Air Quality Control Program in the State Network ("Official Gazette of RS", No. 58/2011)
14. Decree on types of activities and plants for which integrated permit is issued ("Official Gazette of RS", No. 84/2005)
15. Decree on contents of Programme of measures for adjusting existing plant operation or activities to stipulated terms ("Official Gazette of RS", No. 84/2005)
16. 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)
17. Decree on Determining the Program of Dynamics of Submission of Applications for Issuance of Integrated Permit ("Official Gazette of RS", No. 108/2008)
18. 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)
19. Decree on conditions for monitoring and air quality requirements ("Official Gazette of RS", No. 11/2010, 75/2010 and 63/2013)
20. Decree on the methodology for the preparation of the inventory of emissions and projections of air pollutants ("Official Gazette of RS", No. 3/2016)

21. Decree on determining zones and agglomeration ("Official Gazette of RS", No. 58/2011 and 98/2012)
22. Decree on determining Programme of Air Quality Control in state network ("Official Gazette of RS", No. 58/2011).
23. Decree on types of activities with green house effect (Official Gazette of RS", No. 13/2022)
24. Decree on methodology of data collecting for National Records of gas emission with green house effect "Official Gazette of RS", No. 81/2010)
25. 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)
26. Decree on Criteria and Manner of Approval of Programs and Projects Implemented under the Clean Development Mechanism ("Official Gazette of RS", No. 44/2010)
27. 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)
28. 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)
29. Decree on Water Classification ("Official Gazette of SRS", No. 5/1968)
30. Decree on the categorization of watercourses ("Official Gazette of the SRS", No. 5/1968)
31. 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)
32. Decree on limit values of pollutants in surface and groundwater and sediment and deadlines for their achievement ("Official Gazette of RS", No. 50/2012)
33. Decree on systematic monitoring of the condition and quality of land ("Official Gazette of RS", No. 88/2020)
34. Decree on Limit Values of Pollutants, Harmful and Dangerous Substances in Soil ("Official Gazette of RS", No. 30/2018 and 64/2019)
35. Decree on terms and procedure of permit issuing for waste management, as well as criteria, categorization, classification and reporting on mining waste ("Official Gazette of RS", No. 53/2017)
36. Decree on Lists of Waste for transportation over border, contents and layout of documents which follow waste transportation over border with instruction for their filling in ("Official Gazette of RS", No. 34/2022)
37. 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)
38. Decree on waste disposal in landfills ("Official Gazette of RS", No. 92/2010)
39. Decree on Lists of waste for transportation over border, contents and layout of documents which follow waste transportation over border with instruction for their filling in ("Official Gazette of RS", No. 34/2022)
40. 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)
41. Decree on the termination of the Decree on the manner and procedures of asbestos-containing waste management ("Official Gazette of RS" No. 74/2010)
42. Decree of types of Plan for reduction of package waste for period from 2020 to 2024 ("Official Gazette of RS" No. 81/2020)

43. 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 – 16/2011, 48/2012, 41/2013, 81/2014, 30/2015, 44/2016, 43/2017, 45/2018, 20/2019, 49/2020, 51/2021 и 49/2022)
44. 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)
45. Decree on terms and manner of performing subsidized purchase of new vehicles which have only electrical drive, as well as vehicles which are driven by motor with internal combustion and electrical drive (hybrid drive) ("Official Gazette of RS", No. 156/2020 and 53/2021).

RULEBOOKS

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 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)
9. Rulebook on the content and manner of keeping the register of issued integrated permits ("Official Gazette of RS", No. 69/2005)
10. 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)
11. 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)
12. Rulebook on the content of air quality plans ("Official Gazette of RS", No. 21/2010)
13. Rulebook on the content of short-term action plans ("Official Gazette of RS", No. 65/2010)
14. Rulebook on content and appearance of Integrated Permit ("Official Gazette of RS", No. 30/2006)
15. Rulebook on parameters of ecological and chemical status of surface water and parameters of chemical and quantitative status of ground water ("Official Gazette of RS", No. 74/2011)

16. Rulebook on manner and terms for measuring amount and testing of waste water quality and content of Report on performed measurements ("Official Gazette of RS", No. 33/2016)
17. 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)
18. 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)
19. Rulebook on the content and manner of keeping the cadastre of water bodies ("Official Gazette of RS", No. 34/2011)
20. Rulebook on methodology for preparation of Projects of repair and remedy ("Official Gazette of RS", No. 74/2015)
21. Rulebook on content of the Projects of remedy and rehabilitation ("Official Gazette of RS", No. 35/2019)
22. Rulebook on content and form of Reports on land monitoring ("Official Gazette of RS", No. 126/2021)
23. Rulebook on content and manner of keeping cadastre of contaminated locations, type, content, forms, manner and deadlines for data submission ("Official Gazette of RS", No. 58/2019)
24. Rulebook on terms which shall be fulfilled by legal entity for performing land monitoring, as well as documentation which shall be submitted together with application for obtaining authorization for land monitoring ("Official Gazette of RS", No. 58/2019)
25. Rulebook on categories, testing and classification of waste ("Official Gazette of RS", No. 56/2010, 93/2019 and 39/2021)
26. Rulebook on form of request for issuing permit for treatment, i.e. storage, repeated use and disposal of waste ("Official Gazette of RS", No. 38/18)
27. Rulebook on content and appearance of Permit for waste management ("Official Gazette of RS", No. 93/2019)
28. Rulebook on content, manner of keeping and appearance of Register of issued permits for waste management ("Official Gazette of RS", No. 95/2010)
29. 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)
30. 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)
31. Rulebook on the manner of storage, packaging and marking of hazardous waste ("Official Gazette of RS", No. 92/2010 and 77/2021)
32. Rulebook on conditions, manner and procedure of waste oil management ("Official Gazette of RS", No. 71/2010)
33. Rulebook on the manner and procedure of managing spent batteries and accumulators ("Official Gazette of RS", No. 86/2010)
34. Rulebook on the manner and procedure of waste tire management ("Official Gazette of RS", No. 104/2009 and 81/2010)
35. Rulebook on the manner and procedure of waste vehicle management ("Official Gazette of RS", No. 98/2010)
36. Rulebook on the manner and procedure for the management of waste fluorescent tubes containing mercury ("Official Gazette of RS", No. 97/2010)
37. Rulebook on the treatment of waste containing asbestos ("Official Gazette of RS", No. 75/2010)
38. 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)

39. Rulebook on treatment of devices and waste containing PCBs ("Official Gazette of RS", No. 37/2011)
40. Rulebook on import and export of certain hazardous chemicals ("Official Gazette of RS", No. 89/2010, 15/2013 and 114/2014)
41. Rulebook on the content of the safety data sheet ("Official Gazette of RS", No. 100/2011)
42. 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)
43. 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 and 57/2022)
44. Rulebook on criteria for identification of a substance as PBT or VPVB ("Official Gazette of RS", No. 23/2010)
45. Rulebook on licenses for trade activities, ie licenses for the use of particularly dangerous chemicals ("Official Gazette of RS", No. 6/2017, 29/2018)
46. Rulebook on the manner of keeping records on chemicals ("Official Gazette of RS", No. 31/2011)
47. Rulebook on methodology for preparation of Action Plans ("Official Gazette of RS", No. 72/2010)
48. 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)
49. 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)
50. Rulebook on the content of records on sources of non-ionizing radiation of special interest ("Official Gazette of RS", No. 104/2009)
51. 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)
52. 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)
53. 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)
54. 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)
55. Rulebook on methodology for determining acoustic zones ("Official Gazette of RS", No. 72/2010)
56. Rulebook on the methodology for drafting action plans ("Official Gazette of RS", No. 72/2010)
57. Rulebook on expenses of rights award for use of ecological sign ("Official Gazette of RS", No. 81/2010)

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 AND PROGRAMMES

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 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)

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)
18. Programme od Circular Economy Development in the Republic of Serbia for time period from year 2022 to 2024 ("Official Gazette of RS", No. 137/2022).

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 from 1979, 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)
41. Law on confirming Protocols of registers on discharge and transport of pollutants with Convention on availability of information, public participation in decision making and right to legal protection regarding environmental issues (''Official Gazette of RS – International Contracts'', No. 8/2011)
42. Law on confirming Convention on availability of information, public participation in decision making and right to legal protection regarding environmental issues (''Official Gazette of RS – International Contracts'', No. 38/2009)
43. Law on confirming Protocol of heavy metals with Convention on Long-range Transboundary Air Pollution from 1979 (''Official Gazette of RS – International Contracts'', No. 22/2012)
44. Law on confirming Protocol of long-term organic pollutant substances with Convention on Long-range Transboundary Air Pollution from 1979 (''Official Gazette of RS – International Contracts'', No. 21/2012)
45. Law on confirming Convention on Transboundary effects of industrial accidents (''Official Gazette of RS – International Contracts'', N. 42/2009 Decree)

APPENDIX 3. ABBREVIATIONS

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