

DIKTAS II

Implementation of the strategic action program (SAP) of the Dinaric karst aquifer system:
improving groundwater governance and sustainability of related ecosystems.



2 nd in-person EXPERT MEETING

10-11 November 2025

Sarajevo, Bosnia and Herzegovina

4.1. JOINT DATA SHARING MECHANISM: joint design and implementation of a real-time data sharing mechanism and harmonization of different national classification standards of water quality, following EU guidelines

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- 1 Introduction
- 2 Analysis of national legislation
- 3 EU guidelines
- 4 Conclusion

1. INTRODUCTION

GW monitoring:

- Mostly covered by national Water Act/Law (GWB status: chemical and quantitative) –in compliance with EU directives (WFD, GWD, etc)
- Drinking water monitoring- quality of water intended for human consumption- in compliance with EU directives

ALBANIA

Law No. 111/2012 (29/2024) ON INTEGRATED MANAGEMENT OF WATER RESOURCES,

- Article 28 Water Standards; **Environmental quality standards** for water resources (surface and groundwater)
- Article 31 **Drinking water quality**
- Article 85 **Monitoring GW status**
- Article 87 Monitoring of water bodies designated for the production of drinking water
- **No by law for Parameters for Assessment of Good Chemical Status of Groundwater; GWB Chemical status**

Decision of the Council of Ministers (**DCM) No. 379**, dated 25 May 2016, titled — “Regulation on Drinking Water Quality”

- aligns Albanian law with EU Drinking Water on the quality of water intended for human consumption;
- establishes three sanitary protection zones
- Quality standards and monitoring requirements aligned with the EU standards

MICROBIOLOGY:

1	Escherichia coli	CFU/100 ml
2	Enterococci	CFU/100 ml

"Physical" Parameters:

1	Temperature	T	°C
2	pH		
3	Total organic carbon	TOC	
4	Conductivity -	CE	µS/cm
5	Total nitrogen -	TN	mg/l
6	Phosphates	PO ₄ ⁻³	mg/l
7	Chlorides	Cl ⁻	mg/l
8	Sulphates	-SO ₄	mg/l
9	Fluor	F	mg/l
10	Nitrites	NO ₂	mg/l
11	Nitrate	NO ₃	mg/l
12	Ammonium	NH ₄ ⁻	mg/l
13	Potassium	K	mg/l
14	Sodium	Na	mg/l
15	Calcium	Ca	mg/l
16	Magnesium	Mg	mg/l

17	Hidrokarbonat ion	HCO ₃	mg/l
18	carbonate ion	CO ₃ ²	mg/l
19	Total iron	Fe ₂ +Fe ₃	mg/l
20	Silico oxide	SiO ₂	mg/l
21	Total dissolved solids	TDS	mg/l
22	Total Hardness	Th	OH
23	Total Mineralization	Tm	mg/l
24	Aluminum	Al	mg/l
25	Lead	Pb	mg/l
26	Cadmium	Cd	mg/l
27	Manganese	Mn	mg/l
28	Arsenic	As	mg/l
29	Chrome	Cr	mg/l
30	Mercury	Hg	mg/l
31	Nickel	Ni	mg/l
32	Zinc	Zn	mg/l
33	Copper	Cu	mg/l

DRINKING WATER

BOSNIA AND HERCEGOVINA

FEDERATION B&H

WATER ACT (“Official Gazette of FBiH” No. 70/06)

- **Article 25-40 RBMP- Groundwater status and monitoring**
- **Article 48 Drinking Water Quality- certified laboratories**
- **Article 156- Water Agency responsible for organization of GW monitoring**

DECISION on the characterization of surface and groundwater, reference conditions and parameters for the assessment of water status and water monitoring (“Official Gazette of FBiH” No. 01/14)

- **Annex 8 – Parameters for Assessment of Good Chemical Status of Groundwater**
- **Annex 11 – Monitoring programme**

Rulebook on health-safety of drinking water (“Official Gazette of FBiH” No. 40/10, 43/10, 30/12, and 62/17)

- **Part B- Parameters & Frequencies**

8.1 Anorganski parametri

Arsen (As)	10 µg / L
Olovo (Pb)	7 µg / L
Kadmij (Cd)	0,5 µg / L
Živa (Hg)	0,2 µg / L
Amonijak (NH ₃)	0,5 mg / L
Hloridi (Cl ⁻)	250 mg / L
Cijanidi (CN ⁻)	5 µg / L, 50 µg / L, ako nije prisutan slobodni cijanid
Sulfat (SO ₄ ²⁻)	240 mg/L

8.2 Ostali parametri:

Zagađujuća materija	Standard
Nitrati (NO ₃)	50 mg/l
Aktivni sastojci pesticida, uključujući metabolite Produkti pri raspadanju i reakciji (1)	0,1 µg/l 0,5 µg/l (total) (2)
<p>(1) "Pesticidi" su proizvodi za zaštitu bilja kao i uništenje biljnih napasnika kako je to definisano u Članu 2 Direktive 91/414/EEC i Članu 2 of Direktive 98/8/EC.</p> <p>(2) "Total" znači sumu svih pojedinačnih monitoringom detekovanih i izmjerenih pesticida, uključujući relevantne metabolite kao i produkte nastale pri raspadanju istih kao i njihovoj reakciji sa drugim spojevima.</p>	

8.3 Organski parametar:

Ukupni tri-i tetrahloroeten 10 µg/L

GW CHEMICAL STATUS

- 2* YEAR
- Water Agency

Annex 8. DECISION on the characterization of surface and groundwater, reference conditions and parameters for the assessment of water status and water monitoring ("Official Gazette of FBiH" No. 01/14)

Parametar	Rezultati izraženi
K – Obavezni i dodatni parametri	
Temperatura	oC
Koncentracija H ⁺ iona	pH jedinica
Elektrovodljivost	mS cm ⁻¹ kod 25 oC
Otopljeni kisik	mg O ₂ /l
Amonijak	NH ₄ -N mg/l
Nitrati	NO ₃ -N mg/l
Ukupni N	mg/l
Kloridi	Cl mg/l
Sulfati	SO ₄ mg/l
Ukupni P	P mg/l
Ca- CaCO ₃	mg/l CaCO ₃
Mg- CaCO ₃	mg/l CaCO ₃
Kadmij (filtrirani uzorak)	Cd mg/l
Olovo (filtrirani uzorak)	Pb mg/l
Živa (filtrirani uzorak)	Hg mg/l

Cijanidi	CN- mg/l
Pesticidi (ukupni organoklorni i metaboliti)	mg/l
Trikloretilen	mg/l
Tetrakloretilen (eten)	mg/l
Boja	mg/l Pt/Co skale
Mutnoća	NTU jedinica
Miris	
Okus	
Ukupna tvrdoća	CaO mg/l (0 NJ)
Suspendirane tvari	mg/l
Zasićenje kisikom	% zasićenja kisikom
BPK 5	mg O ₂ /l
Utrošak KMnO ₄	mg O ₂ /l
Alkalitet ukupni	mg/l CaCO ₃

DRINKING WATER

- Minimum 1-12 x
- Certified Laboratories

M - Mikrobiološki parametri	
Ukupne koliformne bakterije	br/100 ml
Fekalne koliformne bakterije	E. coli/100 ml
Fekalni streptokoki	br/100 ml
S - Specifični parametri	
Deterđenti anionski	mg/l
Masti i ulja	mg/l
Mineralna ulja	mg/l
Fenoli	C ₆ H ₅ OH mg/l
Željezo (filtrirani uzorak)	Fe mg/l
Cink (filtrirani uzorak)	Zn mg/l
Krom	Cr mg/l
Di(2-etilheksil) ftalat (DEHP)	mg/l
Ukupna β radioaktivnost	Bq/m ³
SAL- Salinitet	
Salinitet*	ppt (g/l) soli*

BOSNIA AND HERCEGOVINA

REPUBLIKA SRPSKA

WATER ACT (“Official Gazette of RS” No. 50/06, 121/12 & 74/17)

- **Article 44 - 46** **GWB status monitoring-** Water Agency
- **Article 52** **Quality of water used for human consumption-** certified laboratories
- **No by law for Parameters for Assessment of Good Chemical Status of Groundwater**

Rulebook on health-safety of waterintendant for human consumption (“Official Gazette of RS” No. 88/17)

- Annex 1:
 - Microbiological parameters
 - Physico-chemical parameters
 - Radiological parameters

BASIC ANYLSIS

Physico-chemical parameters		Microbiology		
Date	Reference value	Date	Reference value	Unit
T (°C)	-	Ukupne koliformne bakterije	0	100 ml
Residual chlorine (mg/L)	0.1-0.5	Escherichia coli	0	100 ml
Water smell	-	Broj kolonija na 22± 2°C	100	1 ml
Water color	-	Broj kolonija na 36± 2°C	20	1 ml
Turbidity (NTU)	<5	Enterococci	0	100 ml
pH	6.5-9.5	Sulfur-reducing clostridia	0	100 ml
Oxidability (mg/L O ₂)	≤5			
Conductivity (mS/cm)	≤2500			
NH ₄	≤0.5			
Cl (mg/L)	≤250			
NO ₂ (mg/L)	≤0.5			
NO ₃ (mg/L)	≤50			
Fe (mg/L)	≤200			
Mn (mg/L)	≤50			

PERIODICAL ANYLSIS

Physico-chemical parameters		Microbiology		
Parameter	Reference value	Data	Reference value	Unit
T (°C)	-	Total coliform bacteria	0	100 ml
Residual chlorine (mg/L)	0.1-0.5	Escherichia coli	0	100 ml
Water smell	-	Broj kolonija na 22± 2°C	100	1 ml
Water color	-	Broj kolonija na 36± 2°C	20	1 ml
Turbidity (NTU)	<5	Enterococci	0	100 ml
pH	6.5-9.5	Sulfur-reducing clostridia	0	100 ml
Oxidability (mg/L O ₂)	≤5	Intestinal protozoa and helminths and their developmental forms	0	0
Conductivity (mS/cm)	≤2500			
Amonijum NH ₄	≤0.5			
Cl (mg/L)	≤250			
NO ₂ (mg/L)	≤0.5			
NO ₃ (mg/L)	≤50			
Fe (mg/L)	≤200			
Mn (mg/L)	≤50			
Anionic detergents (mg/L)	200			
Disinfectants and disinfection by-products				
Coagulation and flocculation agents				
Mineral oil (mg/L)	20			

DRINKING WATER

- Minimum 1-12 x
- Public Health Institute

CROATIA

WATER ACT ("Official Gazette of RC" No. 66/2019, 84/2021, 47/2023)

- **Article 47 Water Quality Standards**
- **Article 50 Monitoring of status- Institute for Waters**
- **Article 100 Identification of Waters for human consumption**

Regulation on Water Quality Standards Regulation on Water Quality Standards ("Official Gazette of RC" No. 96/2019, 20/2023, 50/2023)

- Annex 6 - Quality standards for assessing chemical GW status
- Annex 7B- Monitoring frequency – karst aquifer 4x year

Water for Human Consumption Act ("Official Gazette of RC " No. 30/2023) & **The Rulebook on conformity parameters, analytical methods, and monitoring of water intended for human consumption** ("Official Gazette of RC " No. 64/2023, 88/2023)

- Monitoring of springs/intakes- min 1 a year full analysis (B analysis)
- Annex 1. Parameters, Annex 2- Parameters & Frequencies

Table 1. Indicators monitored within the surveillance monitoring

BASIC INDICATORS	ADDITIONAL INDICATORS pokazatelji	
– dissolved oxygen – pH – elektrical conductivity – nitrates – amonij	– indicators indicating the impact of pollution	– indicators important for the protection of all forms of water use

Table 2. Groundwater quality standards

INDICATOR	Unit	GQS
nitrates (NO ₃) [*]	mg/l	50
Active substances in pesticides, including their relevant 50 mg/l Quality standards metabolites, degradation and reaction products	µg/l	0,1 0,5 total

INDICATOR	UNIT	TV
1. indicators which may occur both naturally and/or as a result of human activities		
Arsen (As) [*]	µg/l	10
Kadmij (Cd)	µg/l	5
Olovo (Pb) [*]	µg/l	10
Živa (hg)	µg/l	1
Amonij (NH ₄) [*]	mg/l	0,5
Kloridi (Cl)	mg/l	250
Sulfati (SO ₄) [*]	mg/l	250
Ortofosfati (P) [*]	mg/l	0,2
Nitriti (NO ₂)	mg/l	0,5
Ukupni fosfor (P) [*]	mg/l	0,35
2. Man-made synthetic substances		
Sum of Trichloroethylene & Tetrachloroethylene	µg/l	10
3. Parameters indicative of saline or other intrusions		
Conductivity	µS/cm	2 500

GW CHEMICAL STATUS

- 4* YEAR
- Water Institut JJS

Table 3. Treshold values for pollutants

Annex 6 Groundwater Quality Standards And Limit Values



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DP

PARAMETRI SKUPINE A	
Fizikalno-kemijski i kemijski pokazatelji	Temperatura
Boja	Aluminij
Mutnoća	Željezo
Okus	Arsen
Miris	Mangan
Koncentracija vodikovih iona (pH vrijednost)	Mikrobiološki pokazatelji
Vodljivost	Escherichia coli(E.coli)* Napomena 1.
Amonij	Ukupni koliformi
Nitriti	Enterokoki* Napomena 1.
Nitrati	Broj kolonija na temperaturi od 22 °C
Kloridi	Broj kolonija na temperaturi od 36 °C
Oksidativnost/ Utrošak KMnO ₄	Clostridium perfringens (uključujući spore)
Rezidue dezinficijensa (slobodni klor, kloriti, klorati, ozon,...)	Pseudomonas aeruginosa
	Ostali pokazatelji

DRINKING WATER

- Min 1 x a year B analysis
- Public Health Institut

Microbiological parameter

Chemical parameters

Indicator parameters

MONTENEGRO

WATER ACT (“Official Gazette of MN” No. 27/07, 73/10, 32/11, 47/11, 48/15, 52/16, 55/16, /17, 80/17 & 84/18)

- **Article 49 Water for human consumption**
- **Article 51 & 52 Water quality & quantity control**
- **Article 75 Water status- GWB status based on a status monitoring**
- **Article 83 Monitoring- surveillance, operational and investigative**

Rulebook on the Method and Deadlines for Determining Groundwater Status (“Official Gazette of MN” No. 052/19) & **Rulebook on the Method and Deadlines for Determining Surface Water Status** (“Official Gazette of MN” No. 025/19),

- **Annex 2 Groundwater Quality Standards And Limit Values**

Rulebook on Parameters, Compliance Verification, Methods, Scope and Implementation of Monitoring of Water Quality for Human Use (“Official Gazette of MN” No. 64/18, 101/21).

- **Microbiological parameters; Physico-chemical and indicator parameters**
- **Annex 1-3 Parameters and frequencis of sampling**



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Parametar	Mjerna jedinica	Prosječna godišnja koncentracija (PGK)
nitriti	mg/l NO ₃	50 mg/l
aktivne supstance u pesticidima*	µg/l	0,1 pojedinačno 0,5 ukupno**

Tabela 1: Parametri za koje su određeni standardi kvaliteta

Parametar	Jedinica	Standard kvaliteta
Dihlormetan	µg/l	2
Tetrahlormetan	µg/l	2
1,2-Dihloreten	µg/l	3
1,1-Dihloreten	µg/l	2
Trihloreten	µg/l	2
Tetrahloreten	µg/l	2
Suma lako isparljivih alifatičnih halogenih ugljovodonika ⁴	µg/l	10

Tabela 2: Parametri za koje su određene granične vrijednosti

GW CHEMICAL STATUS

- 2* YEAR
- IHS+ CETI

Annex 2 Groundwater Quality Standards And Limit Values

Annex 1 Parameters

Microbiological parameter**Physico-chemical
parameters****Indicator parameters****DRINKING WATER**

- 12 x a year
- Public Health Institut

Annex 2 : Basic Analysis (A) and Periodical Analysis B

3. EU STANDARDS

- **GWB CHEMICAL STATUS monitoring (WFD, GWD):**
 - Groundwater Quality Standard (Nitrates, Pesticides)
 - Threshold Values for Pollutants (As, Cd, Pb, Hg, NH₄, Cl, SO₄, Orthophosphate, NO₂, P; Trichloroethylene, Tetrachloroethylene ; Conductivity)
- **Drinking water monitoring- DIRECTIVE 2020/2184 on the quality of water intended for human consumption**
 - Microbiological parameter
 - Chemical parameters
 - Indicator parameters

4. CONCLUSION

GW monitoring:

- GWB chemical status assessment and GW quality standards from WFD and GWD are not so important for karst aquifer
- More useful for analysis of water quality of karst springs are data from Drinking water monitoring- quality of water intended for human consumption

Thank you

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