ANNEX 1

DATA SHEETS FOR SURFACE WATER QUALITY STANDARDS

SECTION 1: PHYSICO-CHEMICAL PARAMETERS

WATER TEMPERATURE (T_{WATER})

PART A: EXISTING QUALITY STANDARDS

Abstraction of surface water for drinking water supply

EU: 75/440/EEC	A1		A2		A3	
	G	I	G	I	G	I
[°C]	22	25 (O)	22	25 (O)	22	25 (O)

MD: Hygienic Regulation Nr. 06.6.3.23 (1997)	Category I	Category II	Category III	MAC
[°C]	-	-	-	-

Protection of Fish Life/Fisheries

EU: 78/659/EEC	Salmonid		Cyprinid	
	G	I	G	I
[°C] (1), (2)	-	21.5 (3) 10 (3)	-	28 (3) 10 (3)

MD: Rules for Protection of Surface Water (1991)	Super and first class	Second class	MAC
[°C]	cold waters: 20 °C summer, 5 °C winter warm waters: 28 °C summer, 8 °C winter		-

Bathing Water /Recreation

EU: 76/160/EEC	G	I
[°C]	-	-

MD: Hygienic Regulation Nr. 06.6.3.23 (1997)	(Annex I)	MAC (Annex II)
[°C]	-	-

Ambient Standards

RO: GD 161	Quality class				
	I	II	III	IV	V
[^{o}C]	-	-	-	-	-

ICPDR	Class				
	I	II (TV)	III	IV	V
[^{o}C]	-	-	-	-	-

ECE	Quality class				
	I	II	III	IV	V
[^{o}C]	-	-	-	-	-

Footnotes

(1) The directive 78/659/EEC contains two sets of standards. The first set (not mentioned in the table above) reads (Annex I): "*1. Temperature measured downstream of a point of thermal discharge (at the edge of the mixing zone) must not exceed the unaffected temperature by more than: 1.5 oC, I value salmonid waters; 3 oC, I value for cyprinid waters. Derogations limited in geographical scope may be decided by Member States in particular conditions if the competent authority can prove that there are no harmful consequences for the balanced development of the fish population.*"

(2) Annex I of 78/659/EEC mentions: "*Thermal discharges must not cause the temperature downstream of the point of thermal discharge (at the edge of the mixing zone) to exceed the following values [see table above] … The 10 ^{o}C temperature limit applies only to breeding periods of species which need cold water for reproduction and only to waters which may contain such species.*"

(3) Derogations are possible in accordance with Article 11: "*The Member States may derogate from this Directive: (a) in the case of certain parameters marked (0) in Annex I, because of exceptional weather or special geographical conditions; (b) when designated waters undergo natural enrichment in certain substances, so that the values set out in Annex I are not respected. Natural enrichment means the process whereby, without human intervention, a given body of water receives from the soil certain substances contained therein.*"

(0) Exceptional climatic or geographical conditions

PART B: PROPOSED QUALITY STANDARDS

Water temperature as such will fluctuate with the climatological (seasonal) conditions and in this respect cannot be expected to be 'regulated'. From an environmental point of view it merely makes sense to apply quality standards for water temperature in case of thermal discharges (e.g. cooling water of power plants or industry). Too high temperatures will negatively affect the aquatic ecosystems, notably organisms like fish. Latter importance for instance can be inferred from the fact that both the Moldovan and the EU fish-related regulations contain standards for water temperature.

As quality standards it is proposed to maintain the existing Moldovan standards, while noticing that in the EU 78/659/EEC directive the standards for salmonid waters are more stringent than for the cyprinid waters. Since the temperature regime is only relevant for Ecosystem functioning and Fish breeding/protection, there is no need to apply standards for the Use Classes IV and V (by default these would imply temperatures higher those defined for the Use Classes II/III.

Proposed quality standards for water temperature (T)

unit	Use Class I	Use Class II	Use Class III	Use Class IV	Use Class V
T_{water} [^{o}C]	- (*natural temperature variations*)	cold waters: ≤20 ^{o}C summer, ≤5 ^{o}C winter warm waters: ≤28 ^{o}C summer, ≤8 ^{o}C winter	cold waters: ≤20 ^{o}C summer, ≤5 ^{o}C winter warm waters: ≤28 ^{o}C summer, ≤8 ^{o}C winter	cold waters: >20 ^{o}C summer, >5 ^{o}C winter warm waters: >28 ^{o}C summer, >8 ^{o}C winter	cold waters: >20 ^{o}C summer, >5 ^{o}C winter warm waters: >28 ^{o}C summer, >8 ^{o}C winter

Compliance testing

sampling frequency* [-]	statistics for class boundary compliance testing
52 (weekly)	Temperature limits may be exceeded for 2% of the cases in summer / winter period
less than 52	Maximum value of summer / winter period

* both upstream and downstream of the point thermal discharge

DISSOLVED OXYGEN (O_2)

PART A: EXISTING QUALITY STANDARDS

Abstraction of Surface Water for Drinking Water Supply

EU: 75/440/EEC	A1		A2		A3	
	G	I	G	I	G	I
[mg O_2/l]	-	-	-	-	-	-
[%]*	>70	-	>50	-	>30	-

MD: Hygienic Regulation Nr. 06.6.3.23 (1997)	Category I	Category II	Category III	MAC
[mg O_2/l]	≥4	≥4	≥4	-
[%]	-	-	-	

Protection of Fish Life / Fisheries

EU: 78/659/EEC	Salmonid		Cyprinid	
	G	I	G	I
[mg O_2/l]	50% ≥9 100% ≥7	50% ≥9 6 (1)	50% ≥8 100% ≥7	50% ≥7 4 (2)
[%]	-	-	-	-

MD: Rules for Protection of Surface Water (1991)	Super and first class	Second class	MAC
[mg O_2/l]	≥6	≥6 summer ≥4 winter	-
[%]	-	-	

Bathing Waters / Recreation

EU: 76/160/EEC	G	I
[mg O_2/l]	-	-
[%]	80 to 120	-

MD: Hygienic Regulation Nr. 06.6.3.23 (1997)	(Annex I)	MAC (Annex II)
[mg O_2/l]	≥4	-
[%]	-	

Ambient Standards

RO: GD 161	Quality class				
	I	II	III	IV	V
[mg O_2/l]	9	7	5	4	<4
epilimnion (stratified waters) [%]	90 – 110	70 - 90	50 – 70	30 – 50	<30
hypolimnion (stratified waters) [%]	90 – 70	70 – 50	50 – 30	30 – 10	<10
unstratified waters [%]	90 – 70	70 – 50	50 – 30	30 – 10	<10

ICPDR	Class				
	I	II (TV)	III	IV	V
[mg O_2/l]	7	6	5	5	<4
[%]	-	-	-	-	-

ECE	Quality class				
	I	II	III	IV	V
[mg O_2/l]	>7	7 – 6	6 – 4	4 – 3	<3
epilimnion (stratified waters) [%]	90 – 110	70 – 90, 110 – 120 (3)	50 – 70, 120 – 130 (3)	30 – 50 130 – 150 (3)	<30 >150 (3)
hypolimnion (stratified waters) [%]	90 – 70	70 – 50	50 – 30	30 – 10	<10
unstratified waters [%]	90 – 70	70 – 50, 110 – 120 (3)	50 – 30, 120 – 130 (3)	30 – 10, 130 – 150 (3)	<10, >150 (3)

Footnotes

(1) When the oxygen concentration falls below 6 mg/l, Member States shall implement the provisions of Article 7 (3). The competent authority must prove that this situation will have no harmful consequences for the balanced development of the fish population. [Article 7 (3) mentions "*If sampling shows that a value set by a Member State in accordance with Article 3 or a comment contained in either of columns G or I of Annex I is not respected, the Member State shall establish whether this is the result of chance, a natural phenomenon or pollution and shall adopt appropriate measures.*"]

(2) When the oxygen concentration falls below 4 mg/l, Member States shall implement the provisions of Article 7 (3). The competent authority must prove that this situation will have no harmful consequences for the balanced development of the fish population.

(3) Upper ranges refer to oversaturation.

(*) Reference to 75/440/EEC Article 8 (d): "*in the case of surface water in shallow lakes or virtually stagnant surface water, for parameters marked with an asterisk in the table in Annex II, this derogation being applicable only to lakes with a depth not exceeding 20 m, with an exchange of water slower than one year, and without a discharge of waste water into the water body.*"

PART B: PROPOSED QUALITY STANDARDS

Dissolved oxygen (O_2) is needed by fish and other aquatic organisms for their respiration and therewith an important ecological parameter. Low oxygen contents as such not directly hamper uses like production of drinking water or recreation, but can indicate pollution stresses and/or eutrophication phenomena that as such may negatively affect these functions.

Proposed quality standards for dissolved oxygen, O_2

unit	Use Class I	Use Class II	Use Class III	Use Class IV	Use Class V
[mg O_2/l]	≥7 (*or natural background levels*)	≥7	≥5	≥4	<4

The proposed standards mainly follow the standards of the EU 78/659/EEC Directive and have been incorporated as following.

- The class I and II values comply with the most stringent G value for both salmonid and cyprinid waters (100% ≥7).

- The class III boundary has been changed from ≥6 to ≥5 mg/l as requested during the stakeholder meetings on 1 November 2006

- The class IV boundary to the most stringent I value for cyprinid waters (4 mg/l).

Compared to the Rules for surface water protection 1991, the standard of Use Class II is more stringent.

The boundaries of the classes I – IV are in agreement with the SRN (1997) standard for drinking water supply and communal waters.

Compliance testing

sampling frequency [-]	statistics for class boundary compliance testing
12 (monthly) or more	5–percentile
less than 12	minimum concentration

The compliance testing procedure deviates from Directive 78/659/EEC, which includes criteria like "50% ≥ *value*" together with "100%≥ *value*". The proposed procedure is more demanding, since now the more stringent values of the I categories have to met (5 percentile). The proposed compliance checking is more simple and in line with most other parameters.

BIOCHEMICAL OXYGEN DEMAND (BOD_5)

PART A: EXISTING QUALITY STANDARDS

Abstraction of Surface Water for Drinking Water Supply

EU: 75/440/EEC	A1		A2		A3	
	G	I	G	I	G	I
[mg O_2/l]	<3	-	<5	-	<7	-

MD: Hygienic Regulation Nr. 06.6.3.23 (1997) [(1)]	Category I	Category II	Category III	MAC
[mg O_2/l]	≤3	≤5	≤7	-

Protection of Fish Life / Fisheries

EU: 78/659/EEC	Salmonid		Cyprinid	
	G	I	G	I
[mg O_2/l]	≤3	-	≤6	-

MD: Rules for Protection of Surface Water (1991)	Super and first class	Second class	MAC
[mg O_2/l] [(1)]	3	3	-

Bathing Waters / Recreation

EU: 76/160/EEC	G	I
[mg O_2/l]	-	-

MD: Hygienic Regulation Nr. 06.6.3.23 (1997)	(Annex I)	MAC (Annex II)
[mg O_2/l] [(1)]	≤6	-

Ambient Standards

RO: GD 161	Quality class				
	I	II	III	IV	V
[mg O_2/l]	3	5	7	20	>20

ICPDR	Class				
	I	II (TV)	III	IV	V
[mg O_2/l]	3	5	10	25	>25

ECE	Quality class				
	I	II	III	IV	V
[mg O_2/l]	-	-	-	-	-

Footnotes

[(1)] The Moldovan standards are for BOD_{total}.

PART B: PROPOSED QUALITY STANDARDS

Biochemical Oxygen Demand (BOD, often called Biological Oxygen Demand) as such is not an actual pollutant. The underlying principle is that for the aerobic degradation of organic waste, the oxygen available in the water is used and hence may no longer be available for aquatic organisms like fish. With a higher BOD the actual oxygen concentration not necessarily has to be lower. But: the higher the BOD, the larger the *risk* for oxygen depletion. Because of the links with the oxygen regime, similar considerations can be applied as for dissolved oxygen: the major focus will be on fish and other aquatic organisms (see data sheet Dissolved oxygen, O_2). The Moldovan standards are defined for BOD_{total} (BOD_{20}): the biochemical oxygen demand over 20 days. In most of Europe, BOD_5 (5 days) is commonly used.

Proposed quality standards for biochemical oxygen demand, BOD_5

unit	Use Class I	Use Class II	Use Class III	Use Class IV	Use Class V
[mg O_2/l]	3 (*or natural background levels*)	5	6	7	>7

The concentrations for the classes I, II and IV have been set by inserting the G values of the Directive 75/440/EEC. For Use Class III, the G values for cyprinid waters of the Directive 78/659/EEC have been applied.

Since the Moldovan standards are for BOD_{total} (BOD_{20}), one cannot directly compare the proposed new BOD_5 standards. Generally, a standard of BOD_{total} of for instance 5 mg O_2/l is basically more stringent then a standard of BOD_5 of 5 mg O_2/l.

Compliance testing

sampling frequency [-]	statistics for class boundary compliance testing
12 (monthly) or more	95–percentile
less than 12	maximum concentration

CHEMICAL OXYGEN DEMAND (COD_{MN})

PART A: EXISTING QUALITY STANDARDS

Abstraction of Surface Water for Drinking Water Supply

EU: 75/440/EEC	A1		A2		A3	
	G	I	G	I	G	I
COD_{Mn} [mg O_2/l]*	-	-	-	-	30? (1)	-
COD_{Cr} [mg O_2/l]*	-	-	-	-	30? (1)	-

MD: Hygienic Regulation Nr. 06.6.3.23 (1997)	Category I	Category II	Category III	MAC
COD_{Mn} [mg O_2/l]	7	15	20	-
COD_{Cr} [mg O_2/l]	-	-	-	-

Protection Of Fish Life / Fisheries

EU: 78/659/EEC	Salmonid		Cyprinid	
	G	I	G	I
COD_{Mn} [mg O_2/l]	-	-	-	-
COD_{Cr} [mg O_2/l]	-	-	-	-

MD: Rules for Protection of Surface Water (1991)	Super and first class	Second class	MAC
COD_{Mn} [mg O_2/l]	7	15	20
COD_{Cr} [mg O_2/l]	-	-	-

Bathing Waters / Recreation

EU: 76/160/EEC	G	I
COD_{Mn} [mg O_2/l]	-	-
COD_{Cr} [mg O_2/l]	-	-

MD: Hygienic Regulation Nr. 06.6.3.23 (1997)	(Annex I)	MAC (Annex II)
COD_{Mn} [mg O_2/l]	30	-
COD_{Cr} [mg O_2/l]	*nu se reglamenteaa*	-

Ambient Standards

RO: GD 161	Quality class				
	I	II	III	IV	V
COD_{Mn} [mg O_2/l]	5	10	20	50	>50
COD_{Cr} [mg O_2/l]	10	25	50	125	>125

ICPDR	Class				
	I	II (TV)	III	IV	V
COD_{Mn} [mg O_2/l]	5	10	20	50	>50
COD_{Cr} [mg O_2/l]	10	25	50	125	>125

ECE	Quality class				
	I	II	III	IV	V
COD_{Mn} [mg O_2/l]	<3	3 – 10	10 – 20	20 – 30	>30
COD_{Cr} [mg O_2/l]	-	-	-	-	-

Footnotes

(1) The directive 75/640/EEC does not specify whether it is COD_{Mn} or COD_{Cr}

(*) Reference to 75/440/EEC Article 8 (d): "*in the case of surface water in shallow lakes or virtually stagnant surface water, for parameters marked with an asterisk in the table in Annex II, this derogation being applicable only to lakes with a depth not exceeding 20 m, with an exchange of water slower than one year, and without a discharge of waste water into the water body.*"

PART B: PROPOSED QUALITY STANDARDS

Chemical Oxygen Demand (COD) is a measure for the amount of oxygen consumed by the chemical breakdown of organic and inorganic matter. For determining Chemical Oxygen Demand, two different oxidising agents can used: potassium permanganate ($KMnO_4$), indicated with COD_{Mn} or potassium dichromate ($K_2Cr_2O_7$), indicated with COD_{Cr}. The latter is more effective, oxidising all organic compounds nearly completely. The big difference with BOD (see data sheet Biochemical Oxygen Demand, BOD_5) is that COD also may include the oxygen consumption for the breakdown of inorganic matter and that it is solely based on *chemical* agents, contrary to *biochemical* oxygen demand.

Proposed quality standards for Chemical Oxygen Demand (permanganate), COD_{Mn}

unit	Use Class I	Use Class II	Use Class III	Use Class IV	Use Class V
COD_{Mn} [mg O_2/l]	<7 (*or natural background levels*)	7	15	20	>20

There is only one entry for COD in the EU Directives (a not-specified COD= 30 as G values in Directive 75/440/EEC). Standards for COD are nevertheless proposed because of their inclusion in the HR, 1997. The proposed class boundaries for the Use Classes II-IV are those of the categories 1 – 3 of the HR, 1997.

Compliance testing

sampling frequency [-]	statistics for class boundary compliance testing
12 (monthly) or more	95–percentile
less than 12	maximum concentration

NITRATE (NO_3)

PART A: EXISTING QUALITY STANDARDS

Abstraction of Surface Water for Drinking Water Supply

EU: 75/440/EEC	A1		A2		A3	
	G	I	G	I	G	I
[mg N/l] [(1)]	5.6	11.3 [(O)]	-	11.3 [(O)]	-	11.3 [(O)]

MD: Hygienic Regulation Nr. 06.6.3.23 (1997)	Category I	Category II	Category III	MAC
[mg N/l]	-	-	-	-

Protection of Fish Life / Fisheries

EU: 78/659/EEC	Salmonid		Cyprinid	
	G	I	G	I
[mg N/l]	-	-	-	-

MD: Rules for Protection of Surface Water (1991)	Super and first class	Second class	MAC
[mg N/l]	-	-	9.1

Bathing Waters / Recreation

EU: 76/160/EEC	G	I
[mg N/l] [(2)]	-	-

MD: Hygienic Regulation Nr. 06.6.3.23 (1997)	(Annex I)	MAC (Annex II)
[mg N/l] [(1)]	11.3	-

Ambient Standards

RO: GD 161	Quality class				
	I	II	III	IV	V
[mg N/l]	1	3	5.6	11.2	>11.2

ICPDR	Class				
	I	II (TV)	III	IV	V
[mg N/l]	1	3	6	15	>15

ECE	Quality class				
	I	II	III	IV	V
[mg N/l]	-	-	-	-	-

Footnotes

(1) Recalculated from NO_3 to NO_3_N with the conversion factor 0.226.
(2) Concentration to be checked by the competent authorities when an inspection in the bathing area shows that the substance may be present or that the quality of the water has deteriorated.
(O) Exceptional climatic or geographical conditions
(*) Reference to 75/440/EEC Article 8 (d): "*in the case of surface water in shallow lakes or virtually stagnant surface water, for parameters marked with an asterisk in the table in Annex II, this derogation being applicable only to lakes with a depth not exceeding 20 m, with an exchange of water slower than one year, and without a discharge of waste water into the water body.*"

PART B: PROPOSED QUALITY STANDARDS

Nitrate is one of the nitrogen compounds that, together with phosphorus, are considered as major nutrients for plants and algae. So, to a certain extent, nutrients in most aquatic systems actually are required for growth of plants and phytoplankton. Pollution with nitrate (NO_3) can be related to various uses:

- *Drinking water supply*. Too high levels of NO_3 in drinking water may cause "Methemoglobinemia" also knows as the 'blue-baby syndrome', since only infants (up to about 6 months) are prone to this phenomenon. Although the nitrate as such has no such effects, it is the conversion of nitrates to nitrites that may cause the problem.

- *Ecology, fishfarming, recreation, drinking water supply*. The key factor here is "eutrophication". An excessive amount of nutrients may lead to algae blooms or overgrowth of plant vegetation. Algae blooms can lead to oxygen depletion and therewith can disturb the aquatic ecology. Swimming in a 'green algae soup' is not considered a pleasure. Algae blooms may go accompanied with too high amount of bluegreen algae (Cyanobacteria), which can have toxic effect when such water is swallowed e.g. during swimming. Algae blooms (through the degradation of dead organic matter) also may cause problems with smell or taste, negatively affecting the drinking water supply (organoleptic quality). In freshwater, eutrophication risks are commonly associated with phosphorus pollution, although meanwhile also there are indications that nitrogen compounds can lead to eutrophication in freshwaters.

Proposed quality standards for NO_3

unit	Use Class I	Use Class II	Use Class III	Use Class IV	Use Class V
[mg N/l]*	1 (*or natural background levels*)	3	5.6	11.3 **	>11.3

* The conversion factor from NO_3 to NO_3_N is 0.226
** GD 161 mentions 11.2 mg N/l, but it is assumed that latter has been the result of a slightly less accurate conversion factor for a total concentration of 50 mg/l NO_3.

Considering the abovementioned considerations, the Romanian GD 161 standards for nitrate seem most appropriate; they furthermore compare overall rather well with the standards of the ICPDR. The values for the classes III-V mainly follow the requirements for drinking water supply, while the proposed standards for the Use Classes I and II are expected to avoid risks for eutrophication.

One problem with setting standards for nutrients is that the effects of pollution with nutrients can differ between areas and between water types. For instance: standing waters (lakes, reservoirs) are more prone to eutrophication than running waters (rivers). Conditions in upper reaches of rivers can be different from the lowland reaches. Different aquatic ecosystems can respond differently to the same nutrient concentrations. The EU Water Framework Directive has introduced the term "type-specific" to underline this problem. Setting of type-specific nutrient standards turns out to be quite complicated and require many data, expert knowledge and understanding of the various water bodies. Within the current settings

(both of the project and Moldova) it is not feasible to formulate type-specific standards for nutrients. Nevertheless, quality standards are proposed, also in order to provide a basis and rationale for the short-term water management. Derogations from the proposed concentrations may be considered once there is sufficient evidence that no eutrophication phenomena occur and the ecosystem functioning of the water bodies concerned is not impaired by higher nitrate levels.

The proposed standards are fully in line with the existing Moldovan standard for communal water use. Compared to the fisheries MAC, the concentrations of the Use Classes I-III are more stringent. Considering “eutrophication”, this merely reflects the wider ecological connotation.

Compliance testing

sampling frequency [-]	statistics for class boundary compliance testing
12 (monthly) or more	95–percentile
less than 12	maximum concentration

NITRITE (NO_2)

PART A: EXISTING QUALITY STANDARDS

Abstraction of Surface Water for Drinking Water Supply

EU: 75/440/EC	A1		A2		A3	
	G	I	G	I	G	I
[mg N/l]	-	-	-	-	-	-

MD: Hygienic regulation Nr. 06.6.3.23 (1997)	Category I	Category II	Category III	MAC
[mg N/l]	-	-	-	-

Protection of Fish Life / Fisheries

EU: 78/659/EC	Salmonid		Cyprinid	
	G	I	G	I
[mg N/l] [(1)]	0.003	-	0.009	-

MD: Rules for protection of Surface Water 1991	Super and first class	Second class	MAC
[mg N/l]	-	-	0.02

Bathing Waters / Recreation

EU: 76/160/EC	G	I
[mg N/l]	-	-

MD: Hygienic regulation Nr. 06.6.3.23	(Annex 1)	MAC (Annex 2)
[mg N/l] [(1)]	-	1.0

Ambient Standards

RO: GD 161	Quality class				
	I	II	III	IV	V
[mg N/l]	0.01	0.03	0.06	0.3	>0.3

ICPDR	Class				
	I	II (TV)	III	IV	V
[mg N/l]	0.01	0.06	0.12	0.3	>0.3

ECE	Quality class				
	I	II	III	IV	V
[mg N/l]	-	-	-	-	-

Footnotes

[(1)] Recalculated from NO_2 to NO_2_N with the conversion factor 0.304.

PART B: PROPOSED QUALITY STANDARDS

In the so-called 'nitrogen-cycle', organic nitrogen is broken down to ammonium (NH_4/NH_3). During "nitrification", ammonium is broken down to nitrates (NO_3) and nitrites (NO_2). Nitrite is relatively short-lived in water, because it is quickly converted to nitrate by bacteria. Because of its short lifetime, pollution with NO_2 mainly is relevant for aquatic organisms (during the abstraction and preparation of drinking water from surface water nitrites already will have been degraded). The EU directive 78/659/EC only provide Guide values for salmonid respectively cyprinid waters, while the Moldovan fisheries standards only contain one MAC.

During the stakeholder consultation sessions in Chişinău on 1 and 10 November 2006 it has been requested to propose standards for nitrite ($N0_2$) in the new system of SWQS.

It is proposed to use the ICPDR standards for the boundaries of the Use Classes I-V.

Compared to the Moldovan fish standards these values are less stringent, except for Use Class I.

Proposed quality standards for nitrite (NO_2)

unit	Use Class I	Use Class II	Use Class III	Use Class IV	Use Class V
[mg N/l]	≤0.01 (*or natural background levels*)	0.06	0.12	0.3	>0.3

Compliance testing

sampling frequency [-]	statistics for class boundary compliance testing
12 (monthly) or more	95–percentile
less than 12	maximum concentration

AMMONIUM (NH_4)

PART A: EXISTING QUALITY STANDARDS

Abstraction of Surface Water for Drinking Water Supply

EU: 75/440/EEC	A1		A2		A3	
	G	I	G	I	G	I
[mg N/l] (1)	0.04	-	0.8	1.2	1.6	3.1 (O)

MD: Hygienic Regulation Nr. 06.6.3.23 (1997)	Category I	Category II	Category III	MAC
[mg N/l]	-	-	-	2

Protection of Fish Life / Fisheries

EU: 78/659/EEC	Salmonid		Cyprinid	
	G	I	G	I
[mg N/l] (1), (2)	0.03	0.8 (3)	0.2	0.8 (3)

MD: Rules for Protection of Surface Water (1991)	Super and first class	Second class	MAC
[mg N/l] (1)	-	-	0.4

Bathing Waters / Recreation

EU: 76/160/EEC	G	I
[mg N/l] (4)	-	-

MD: Hygienic Regulation Nr. 06.6.3.23 (1997)	(Annex I)	MAC (Annex II)
[mg N/l]	-	2

Ambient Standards

RO: GD 161	Quality class				
	I	II	III	IV	V
[mg N/l]	0.4	0.8	1.2	3.2	>3.2

ICPDR	Class				
	I	II (TV)	III	IV	V
[mg N/l]	0.2	0.3	0.6	1.5	>1.5

ECE	Quality class				
	I	II	III	IV	V
[mg N/l]	-	-	-	-	-

Footnotes

(1) Recalculated from NH_4 to NH_4_N with the conversion factor 0.776.

(2) Annex I of 78/659/EEC mentions: "In order to diminish the risk of toxicity due to non-ionized ammonia, of oxygen consumption due to nitrification and of eutrophication, the total ammonium should not exceed the following *[authors: follow the concentrations mentioned in the table above]*".
(3) In particular geographical or climatic conditions and particularly in cases of law water temperature and of reduced nitrification or where the competent authority can prove that there are no harmful consequences for the balanced development of the fish population, Member States may fix values higher than 1 mg/l *[authors: ⇔ 0.78 mg N/l]*.
(4) These parameters must be checked by the competent authorities when there is a tendency towards eutrophication of the water.

PART B: PROPOSED QUALITY STANDARDS

The term ammonia refers to two chemical species of ammonia which are in equilibrium in water (NH_3, un-ionized and NH_4+, ionized, also known as ammonium). Tests for ammonia usually measure total ammonia (NH_3 plus NH_4^+). The toxicity to ammonia is primarily attributable to the un-ionized form (NH_3), as opposed to the ionized form (NH_4^+). The percentage of NH_3 increases with temperature and pH.

Ammonium is a relevant parameter because:

- of its (indirect, see above) toxicity, hence possibly affecting aquatic organisms, including fish;
- being a nitrogen compound, possibly adding as a nutrient to risks of eutrophication (see data sheet for NO_3 for further details).

According to the WHO *"Ammonia is not of direct importance for health in the concentrations to be expected in drinking-water. A health-based guideline has therefore not been derived"*

Proposed quality standards for ammonium, NH_4

unit	Use Class I	Use Class II	Use Class III	Use Class IV	Use Class V
[mg N/l]	0.2 (*or natural background levels*)	0.4	0.8	3.1	>3.1

With primarily the ecological uses (general ecology and fisheries) being at stake, the boundary for Use Class III has been set to 0.8 mg N/l, being the mandatory I value for cyprinid (and salmonid) waters according to the Directive 78/659/EEC. With salmonid waters generally requiring better water quality, the boundary for Use Class II has been set to 0.4 mg N/l, in accordance with the current MAC used in Moldova. The standard for Use Class I has been set to 0.2 mg N/l. This seems a reasonable estimate for an 'average' background concentration level. The concentration for Use Class IV is based on the I value of the Directive 75/440/EEC.

Natural ammonium concentrations may vary between water types and areas and vice versa different aquatic ecosystems may respond differently to same concentration levels of ammonium. So, also ammonium finally needs to be regarded in the type-specific context as explained in the data sheet for NO_3.

Compared to the existing Moldovan standards, the following differences can be notice with the proposed values:

- In the case of cyprinid water the MAC for fisheries will be increased from 0.4 to 0.8 mg N/l; for salmonid waters the proposed quality standard is the same.
- Compared to the current Moldovan MAC for communal use (2 mg N/l), the boundary concentration for the related Use Class III (up to Use Class III waters are considered suitable for the recreation function) is considerably lower. As mentioned above: the relation between NH_4 and communal use is mainly via eutrophication. The footnote for the bathing water directive

76/160/EEC (see above) is considered an important additional criterion. Derogation of the standard for Use Class III in case of communal use may be considered if there is sufficient evidence that higher NH_4 concentrations will not have negative impacts for recreational use of the waters.

- Considering the abstraction of drinking water function, the proposed standard for Use Class IV is higher than the current Moldovan MAC. Taking into account the viewpoint of the WHO, this standard therefore should not be decisive for the drinking water abstraction.

Compliance testing

sampling frequency [-]	statistics for class boundary compliance testing
12 (monthly) or more	95–percentile
less than 12	maximum concentration

TOTAL NITROGEN (N_{TOT})

PART A: EXISTING QUALITY STANDARDS

Abstraction of Surface Water for Drinking Water Supply

EU: 75/440/EEC	A1		A2		A3	
	G	I	G	I	G	I
[mg N/l]	-	-	-	-	-	-

MD: Hygienic Regulation Nr. 06.6.3.23 (1997)	Category I	Category II	Category III	MAC
[mg N/l]	-	-	-	-

Protection of Fish Life / Fisheries

EU: 78/659/EEC	Salmonid		Cyprinid	
	G	I	G	I
[mg N/l]	-	-	-	-

MD: Rules for Protection of Surface Water (1991)	Super and first class	Second class	MAC
[mg N/l]	-	-	-

Bathing Waters / Recreation

EU: 76/160/EEC	G	I
[mg N/l]	-	-

MD: Hygienic Regulation Nr. 06.6.3.23 (1997)	(Annex I)	MAC (Annex II)
[mg N/l]	-	-

Ambient Standards

RO: GD 161	Quality class				
	I	II	III	IV	V
[mg N/l]	1.5	7	12	16	>16

ICPDR	Class				
	I	II (TV)	III	IV	V
[mg N/l]	1.5	4	8	20	>20

ECE	Quality class				
	I	II	III	IV	V
[mg N/l]	<0.3	0.3 – 0.75	0.75 – 1.5	1.5 – 2.5	>2.5

PART B: PROPOSED QUALITY STANDARDS

Total nitrogen comprises both inorganic nitrogen (NO_2, NO_3, NH_4) and organic nitrogen. While NO_3 and NH_4 as nutrients can contribute to eutrophication, it prevails to apply standards for total nitrogen as well. Finally it is the total nitrogen loading being important for risks of eutrophication.

Proposed quality standards for total-N

unit	Use Class I	Use Class II	Use Class III	Use Class IV	Use Class V
[mg N/l]	1.5 (*or natural background levels*)	4	8	20	>20

The Romanian standards contain relatively high concentrations (compare also the ECE standards) and are expected to not sufficiently adequate for prevention of eutrophication. It is therefore proposed to apply as standards the concentrations of the ICPDR, although they have primarily been introduced for *classification* purposes.

Total-N concentrations may vary between water types and areas. Vice versa different aquatic ecosystems may respond differently to same concentration levels of nitrogen. Thus, total-N needs to be regarded in the type-specific context (as explained in the data sheet for NO_3). Therefore, derogations from the proposed concentrations may be considered once there is sufficient evidence that no eutrophication phenomena occur and the ecosystem functioning of the water bodies concerned is not impaired.

Total-N is not included in the current Moldovan quality standards, so as such represents a new parameter.

Compliance testing

sampling frequency [-]	statistics for class boundary compliance testing
12 (monthly) or more	95–percentile
less than 12	maximum concentration

TOTAL-PHOSPHORUS (P_{TOT}); ORTHO-PHOSPHATES (PO_4)

PART A: EXISTING QUALITY STANDARDS

Abstraction of Surface Water for Drinking Water Supply

EU: 75/440/EEC	A1		A2		A3	
	G	I	G	I	G	I
Total-P [mg P/l] * (1)	0.4	-	0.7	-	0.7	-
PO_4 [mg P/l]	-	-	-	-	-	-

MD: Hygienic Regulation Nr. 06.6.3.23 (1997)	Category I	Category II	Category III	MAC
Total-P [mg P/l]	-	-	-	-
PO_4 [mg P/l]	-	-	-	-

Protection of Fish Life / Fisheries

EU: 78/659/EEC	Salmonid		Cyprinid	
	G	I	G	I
Total-P [mg P/l] (2)	-	-	-	-
PO_4 [mg P/l]	-	-	-	-

MD: Rules for Protection of Surface Water (1991)	Super and first class	Second class	MAC
Total-P [mg P/l]	-	-	-
PO_4 [mg P/l]**	-	-	0,2 mg/l (P) for eutrophic waters, 0,1 mg/l (P) for mezo-trophic waters and 0,04 mg/l (P) for oligo-trophic waters

Bathing Waters / Recreation

EU: 76/160/EEC	G	I
Total-P [mg P/l]	-	-
PO_4 [mg P/l] (3)	-	-

MD: Hygienic Regulation Nr. 06.6.3.23 (1997)	(Annex I)	MAC (Annex II)
Total-P [mg P/l]	-	-
PO_4 [mg P/l]	-	-

Ambient Standards

RO: GD 161	Quality class				
	I	II	III	IV	V
Total-P [mg P/l]	0.15	0.4	0.75	1.2	>1.2
PO_4 [mg P/l]	0.1	0.2	0.4	0.9	0.9

ICPDR	Class				
	I	II (TV)	III	IV	V
Total-P [mg P/l]	0.1	0.2	0.4	1	>1
PO_4 [mg P/l]	0.05	0.1	0.2	0.5	>0.5

ECE	Quality class				
	I	II	III	IV	V
Total-P [mg P/l] [4]	<0.01 (<0.015)	0.01-0.02 (0.015-0.04)	0.025-0.05 (0.04-0.075)	0.05-0.125 (0.075-0.19)	>0.125 (>0.19)
PO_4 [mg P/l]	-	-	-	-	-

Footnotes

[1] The parameter has been included to satisfy the ecological requirements of certain types of environment.
[2] Total phosphorus is included in Annex I of 78/659/EEC, but no numeric values are mentioned.
[3] Concentration to be checked by the competent authorities when an inspection in the bathing area shows that the substance may be present or that the quality of the water has deteriorated.
[4] Bracketed data refer to flowing water.
[*] Reference to 75/440/EEC Article 8 (d): "*in the case of surface water in shallow lakes or virtually stagnant surface water, for parameters marked with an asterisk in the table in Annex II, this derogation being applicable only to lakes with a depth not exceeding 20 m, with an exchange of water slower than one year, and without a discharge of waste water into the water body.*"
([**]) These standards are so-called OMACs (oriented MACs)

PART B: PROPOSED QUALITY STANDARDS

Most common analyses of phosphorus in water samples are: total-Phosphorus (P_{tot}) and ortho-phosphates (PO_4). Total-Phosphorus comprises both dissolved and particulate forms of P. PO_4 is only dissolved and the form used by plants.

As a nutrient, phosphorus is an essential element for plant growth. But, too much loading with nutrients though can lead to eutrophication. Therefore, mainly the 'ecosystem functioning' use is an important consideration for setting quality standards for phosphorus. As explained in the data sheet for NO_3, eutrophication furthermore can negatively impact the drinking water supply, fishfarming and recreation. Phosphoros/phosphates are not toxic to people (thus not an issue for drinking water abstraction) or animals.

Proposed quality standards for total-P and PO_4

unit	Use Class I	Use Class II	Use Class III	Use Class IV	Use Class V
P_{tot} [mg P/l]	0.1 (*or natural background levels*)	0.2	0.4	1	>1
PO_4 [mg P/l]	0.05 (*or natural background levels*)	0.1	0.2	0.5	>0.5

The Romanian standards contain relatively high concentrations (compare also the ECE standards) and are expected not to be sufficiently adequate for prevention of eutrophication. It is therefore proposed to apply the concentrations of the ICPDR, although they have primarily been introduced for *classification* purposes.

As is the case with nitrogen compounds, also phosphorus concentrations may vary between water types and areas. Vice versa different aquatic ecosystems may respond differently to same concentration levels of phosphorus. The ECE standards are a good example: the concentration of the quality standards for running waters are higher than for standing waters (incl. lakes and reservoirs), since standing waters are more prone to eutrophication. Thus, also total-P and PO_4 finally need to be regarded in the type-specific context as explained in the data sheet for NO_3. Therefore, derogations may be considered once there is sufficient evidence that no eutrophication phenomena occur and the ecosystem functioning of the water bodies concerned is not impaired.

Total-P is not included in the current Moldovan quality standards, so as such represents a new parameter.

Compliance testing

sampling frequency [-]	statistics for class boundary compliance testing
12 (monthly) or more	95–percentile
less than 12	maximum concentration

VARIOUS GENERAL PARAMETERS

pH

The pH as a typical parameter that can be considered as 'intrinsic' water bodies. The acidity/basicity is determined by a (complex) combination of factors, like the geological settings of the water body. For these and other reasons, it simply is not possible to set 'uniform standards' for pH. But, at least there are some ranges within which the pH of surface waters normally can be found. A pH value is outside of this range may be caused some extraordinary circumstances (effluent discharge, eutrophication, et cetera) and as such can serve as an 'alarm-indicator'.

Proposed quality standards for pH

unit	Use Class I	Use Class II	Use Class III	Use Class IV	Use Class V
[-]	6.5 – 9.0	6.5 – 9.0	6.5 – 9.0	6.5 – 9.0	<6.5 or >9.0

The EU Directive 78/659/EEC mentions a pH range of 6-9. The Directive 75/440/EEC mentions G values for two ranges: 6.5-8.5 (A1) and 5.5-9 (A2, A3). The upper limit has been changed from 8.5 to 9.0 as requested during the November 2006 consultations.

Compliance testing

sampling frequency [-]	statistics for class boundary compliance testing
12 (monthly) or more	5-percentile (for lower limits: <6.0) 95–percentile (for upper limits: >9.0)
less than 12	minimum pH (for lower limits: <6.0) maximum pH (for upper limits: >9.0)

TOTAL MINERALIZATION

Total mineralization comprises a wide range of 'major ions' and can be assessed in different ways (individual ions, total dissolved salts, electric conductivity, et cetera). Major ions are present in all aquatic ecosystems just because of geogenic and other natural sources. For a country like Moldova this is an important feature. Just because of the geological conditions, there is a gradient with increasing salinity from north to south. Of course, anthropogenic activities can lead to increasing the salinity.

Salinity (total mineralization) may be an issue for the following water uses:

- *Drinking water supply*. People simply will not appreciate getting 'salty tasting' water from the tap (but health risks are not really involved). For instance food processing industries will need potable water with low salinity in order for their products not to be affected. Generally, salts can induce corrosion of the pipes.

- *Irrigation*. Albeit depending on the type of crops, irrigation waters containing too much salt finally can impact agricultural production. Furthermore, salinisation of soils is a mere irreversible process.

- *Process/cooling water*. Being basically a 'low quality demanding' type of use, even the use of surface water for such generic purposes like cooling can benefit from low salinity. Besides (increased) corrosion of the piping system, also hardness can become an issue (risks for 'clogging' of the pipes with limestone).

Proposed quality standards for total mineralization, Min_{tot}

unit	Use Class I	Use Class II	Use Class III	Use Class IV	Use Class V
[mg/l]	<1000	1000	1300	1500	.>1500

The above standards for the classes III-V were proposed during the consultation sessions (1 and 10 November 2006). The standards for the classes I and II are in line with the ones defined in HR, 1997.

Compliance testing

sampling frequency [-]	statistics for class boundary compliance testing
12 (monthly) or more	95–percentile
less than 12	maximum concentration

FLOATING MATERIALS

Floating materials encompasses a wide range of not naturally introduced objects (debris) like plastic bags, polyethylene or glass bottles and other such kind of domestic/municipal solid waste products.

Proposed quality standards for Floating Materials

unit	Use Class I	Use Class II	Use Class III	Use Class IV	Use Class V
visual inspection	absent	absent	absent	absent	might be present

Monitoring of floating materials will be by means of monthly visual inspections by the competent authorities. A statistical compliance checking method is not suitable for this parameter.

TOTAL IRON (Fe)

Iron as such does not impose human health or other ecotoxicological risks (unless being introduced in extreme quantities). Because of its effect on the taste of drinking water, iron nevertheless can be a parameter of interest. Iron can be present in the surface waters from natural sources; the geogenic loading with iron can differ between regions.

Inclusion of Fe in the proposed system of standards is merely done for compatibility reasons with SRN (1997).

Proposed quality standards for total iron (Fe)

unit	Use Class I	Use Class II	Use Class III	Use Class IV	Use Class V
[mg/l]	<1 (*or BG*)	1	3	5	>5

The Directives 75/440/EEC contains standards for dissolved iron (compare Annex II). Nevertheless, the existing standards of SRN (1997) for total iron are proposed.

Compliance testing

sampling frequency [-]	statistics for class boundary compliance testing
12 (monthly) or more	95–percentile
less than 12	maximum concentration

MANGANESE (Mn)

Manganese as such does not impose human health or ecotoxicological risks. Because of its effect on the taste of drinking water, manganese nevertheless can be a parameter of interest. Manganese can be present in the surface waters from natural sources. The geogenic loading with manganese can differ between regions.

Inclusion of Mn in the proposed system of standards is merely done for compatibility reasons with SRN (1997).

Proposed quality standards for manganese (Mn)

unit	Use Class I	Use Class II	Use Class III	Use Class IV	Use Class V
[mg/l]	<0.1 (*or BG*)	0.1	1	2	>2

The Directives 75/440/EEC contains only G values for manganese (compare Annex II). The existing standards of SRN (1997) for manganese are proposed.

Compliance testing

sampling frequency [-]	statistics for class boundary compliance testing
12 (monthly) or more	95–percentile
less than 12	maximum concentration

ODOUR

Odour is a typical organoleptic parameter. A ‘bad smell’ simply makes a water body not attractive for recreation or drinking water supply, although basically no human health risks will be involved. Of course, odour can be an indicator of surface water being in a poor condition because of different reasons (discharges of waste water, rotting processes induced by eutrophication, oil spills, et cetera).

Proposed quality standards for odour

unit	Use Class I	Use Class II	Use Class III	Use Class IV	Use Class V
points (20 ^{o}C and 60 ^{o}C)	<2 (*natural smell*)	2	2	4	>4

The Directive 75/440/EEC contains G values for odour. The Directive 76/160//EEC mentions odour in the context of Phenols (phenol indices, C_5H_5OH). The proposed standards are based upon SRN (1997), with one noticeable difference. Because of its link with Bathing/recreation, the standard for Use Class III is set to 2 points, while the standard for the matching category 2 water body for abstraction of drinking water is 3 points. In cases where bathing/recreation is not relevance, a derogation of the standard of Use Class III to 3 points can be considered when abstraction of drinking water is the major use.

Compliance testing

sampling frequency [-]	statistics for class boundary compliance testing
12 (monthly) or more	95–percentile
less than 12	maximum concentration

COLOUR

Although there is no such thing as 'the colour of (surface) water', it still is useful to include colour as a –regulatory- parameter. Colour as such does not have human health or ecotoxicological effects, but can serve as a more generic water quality status indicator. Observations that can be considered as 'abnormal' should trigger actions in the water management sector.

Proposed quality standards for odour

unit	Use Class I	Use Class II	Use Class III	Use Class IV	Use Class V
[grade]	<35 (*natural colour*)	35	120	200	>200

Colour is included in the various EU Directives as such, but it is proposed to use the standards currently in place in Moldova since they are already well known. The standards are those of the SRN (1997). (The RPSW (1991) merely mention that the Presence of an artificial colour is prohibited)

Compliance testing

sampling frequency [-]	statistics for class boundary compliance testing
12 (monthly) or more	95–percentile
less than 12	maximum concentration

CHLORIDE (CL^-)

PART A: EXISTING QUALITY STANDARDS

Abstraction of Surface Water for Drinking Water Supply

EU: 75/440/EEC	A1		A2		A3	
	G	I	G	I	G	I
[mg/l]	200	-	200	-	200	-

MD: Hygienic Regulation Nr. 06.6.3.23 (1997) [(1)]	Category I	Category II	Category III	MAC
[mg/l]	350 [(1)]	350 [(1)]	350 [(1)]	500

Protection of Fish Life / Fisheries

EU: 78/659/EEC	Salmonid		Cyprinid	
	G	I	G	I
[mg/l]	-	-	-	-

MD: Rules for Protection of Surface Water (1991)	Super and first class	Second class	MAC
[mg/l]	-	-	-

Bathing Waters / Recreation

EU: 76/160/EEC	G	I
[mg/l]	-	-

MD: Hygienic Regulation Nr. 06.6.3.23 (1997)	(Annex I)	MAC (Annex II)
[mg/l]	350 [(1)]	500

Ambient Standards

RO: GD 161	Quality class				
	I	II	III	IV	V
[mg/l]	25	50	250	300	>300

ICPDR	Class				
	I	II (TV)	III	IV	V
[mg/l]	-	-	-	-	-

ECE	Quality class				
	I	II	III	IV	V
[mg/l]	-	-	-	-	-

Footnotes

[(1)] The concentrations for chloride are mentioned as part of the standards for Total mineralization in the HR, 1997.

PART B: PROPOSED QUALITY STANDARDS

The chloride ion (Cl^-) as such is not a harmfull toxic substance. For two types of water uses, the chloride concentrations nevertheless can be important:

- **Drinking water supply**: chloride concentrations first off all could negatively impact the taste of the drinking water ("salty"). High chloride concentrations in the potable water may cause problems to people who have problems with the functioning of their kidneys or suffer from high blood pressure. The chloride ion cannot simply be removed with common drinking water treatment procedures. Interesting to notice is that many 'mineral waters' recommended for consumption actually can contain high chloride concentrations (1000 mg/l and more).

- **Irrigation**: major ions (salts) tend to accumulate in the soils of irrigated areas, which can result in salinization of the soils, finally maybe even rendering these soils no longer being suitable for crop production.

Chloride concentrations can vary due to natural geological and geochemical background conditions. For instance: in Moldova there appears to be a gradient with increasing major ion concentrations from north to south. This can be explained by the presence of former marine sediments closer and closer to the earth's surface in a southward direction.

Chloride is already included in the existing Moldovan HR, 1997 standards for Total mineralization. Nevertheless, during the stakeholder consultation sessions in Chişinău on 1 and 10 November 2006 it has been requested to propose separate standards for chloride in the new system of SWQS.

Proposed quality standards for chloride (Cl^-)

unit	Use Class I	Use Class II	Use Class III	Use Class IV	Use Class V
[mg/l]	<200 (*or natural background levels*)	200	350	500	>500

The proposed quality standards are derived as follows:

- the standards for Class I and II are based on the Guidance values of the EU 75/440 Directive; please notice that natural background concentrations of chloride can vary between regions because of their specific geological/geochemical natural background conditions.

- the standard for Class III is the one already mentioned in the standard for Total mineralization in the Moldovan HR, 1997

- the standards for Class IV and V were proposed during the consultation sessions on 1 and 10 November 2006.

Compliance testing

sampling frequency [-]	statistics for class boundary compliance testing
12 (monthly) or more	95–percentile
less than 12	maximum concentration

SULPHATES (SO_4)

PART A: EXISTING QUALITY STANDARDS

Abstraction of Surface Water for Drinking Water Supply

EU: 75/440/EEC	A1		A2		A3	
	G	I	G	I	G	I
[mg/l]	150	250	150	350(O)	150	350(O)

MD: Hygienic Regulation Nr. 06.6.3.23 (1997) (1)	Category I	Category II	Category III	MAC
[mg/l]	500 (1)	500 (1)	500 (1)	-

Protection of Fish Life / Fisheries

EU: 78/659/EEC	Salmonid		Cyprinid	
	G	I	G	I
[mg/l]	-	-	-	-

MD: Rules for Protection of Surface Water (1991)	Super and first class	Second class	MAC
[mg/l]	-	-	-

Bathing Waters / Recreation

EU: 76/160/EEC	G	I
[mg/l]	-	-

MD: Hygienic Regulation Nr. 06.6.3.23 (1997)	(Annex I)	MAC (Annex II)
[mg/l]	500 (1)	-

Ambient Standards

RO: GD 161	Quality class				
	I	II	III	IV	V
[mg/l]	60	120	250	300	>300

ICPDR	Class				
	I	II (TV)	III	IV	V
[mg/l]	-	-	-	-	-

ECE	Quality class				
	I	II	III	IV	V
[mg/l]	-	-	-	-	-

Footnotes

(O) Exceptional climatic or geographical conditions

(1) The concentrations for sulphates are mentioned as part of the standards for Total mineralization in the HR, 1997.

PART B: PROPOSED QUALITY STANDARDS

Sulphates basically already are included in the existing Moldovan HR, 1997 standards for Total mineralization. Nevertheless, during the stakeholder consultation sessions in Chişinău on 1 and 10 November 2006 it has been requested to propose separate standards for SO_4 in the new system of SWQS.

Proposed quality standards for sulphates (SO_4)

unit	Use Class I	Use Class II	Use Class III	Use Class IV	Use Class V
[mg/l]	<250 (*or natural background levels*)	250	350	500	>500

The proposed quality standards are derived as follows:

- the standards for Class I and II are based on the Mandatory values of the EU 75/440 Directive
- the standard for Class III is the one already mentioned in the standard for Total mineralization in the Moldovan HR, 1997
- the standards for Class IV and V were proposed during the consultation sessions on 1 and 10 November 2006.

Compliance testing

sampling frequency [-]	statistics for class boundary compliance testing
12 (monthly) or more	95–percentile
less than 12	maximum concentration

PHENOLS

PART A: EXISTING QUALITY STANDARDS

Abstraction of Surface Water for Drinking Water Supply

EU: 75/440/EC	A1		A2		A3	
	G	I	G	I	G	I
Phenols (phenol index) paranitraniline 4 aminoantipyrine mg/1 C_6H_5OH	-	0.001	0.001	0.005	0.01	0.1

MD: Hygienic regulation Nr. 06.6.3.23	Category I	Category II	Category III	MAC
[mg/l]	-	-	-	0.001

Protection of Fish Life / Fisheries

EU: 78/659/EC	Salmonid		Cyprinid	
	G	I	G	I
[mg/l C_6H_5OH]	-	([2])	-	([2])

MD: Rules for protection of Surface Water 1991	Super and first class	Second class	MAC
=	-	-	0.3

Bathing Waters / Recreation

EU: 76/160/EC	G	I
Phenols (phenol indices)	X	No specific odour
[mg/l C_5H_5OH]	≤0.005	-

MD: Hygienic regulation Nr. 06.6.3.23 (1997)	(Annex 1)	MAC (Annex 2)
[mg/l]	-	0.001

Ambient Standards

RO: GD 161	Quality class				
	I	II	III	IV	V
Total phenols (phenols index) [mg/l]	0.001	0.005	0.020	0.050	>0.050

ICPDR	Class				
	I	II (TV)	III	IV	V
[mg/l]	-	-	-	-	-

ECE	Quality class				
	I	II	III	IV	V
[mg/l]	-	-	-	-	-

Footnotes

([2]) Phenolic compounds must not be present in such concentrations that they adversely affect fish flavour.

PART B: PROPOSED QUALITY STANDARDS

The perception of the significance of pollution with phenols in ambient waters differs, but an overall denominator seems to be: taste. During the stakeholder consultation sessions in Chişinău on 1 and 10 November 2006 it has been requested to propose standards for phenols in the new system of SWQS. The proposed standards follow the I values of the categories A1 – A3 of the Directive 75/440.

Proposed quality standards for phenols

unit	Use Class I	Use Class II	Use Class III	Use Class IV	Use Class V
[mg/l]	0.001 (*or natural background levels*)	0.001	0.005	0.1	>0.1

Compliance testing

sampling frequency [-]	statistics for class boundary compliance testing
12 (monthly) or more	95–percentile
less than 12	maximum concentration

OIL PRODUCTS

PART A: EXISTING QUALITY STANDARDS

Abstraction of Surface Water for Drinking Water Supply

EU: 75/440/EC	A1		A2		A3	
	G	I	G	I	G	I
Dissolved or emulsified hydrocarbons (after extraction by petroleum ether) [mg/1]	-	0.05	-	0.1	0.5	1

MD: Hygienic regulation Nr. 06.6.3.23	Category I	Category II	Category III	MAC
[mg/l]	-	-	-	0.5

Protection of Fish Life / Fisheries

EU: 78/659/EC	Salmonid		Cyprinid	
	G	I	G	I
petroleum hydrocarbons [mg/l]	-	([3])	-	([3])

MD: Rules for protection of Surface Water 1991	Super and first class	Second class	MAC
=	-	-	0.05

Bathing Waters / Recreation

EU: 76/160/EC	G	I
Mineral oils	-	No film visible on the surface of the water and no colour

MD: Hygienic regulation Nr. 06.6.3.23 (1997)	(Annex 1)	MAC (Annex 2)
[mg/l]	-	0.5

Ambient Standards

RO: GD 161	Quality class				
	I	II	III	IV	V
	-	-	-	-	-

ICPDR	Class				
	I	II (TV)	III	IV	V
	-	-	-	-	-

ECE	Quality class				
	I	II	III	IV	V
	-	-	-	-	-

Footnotes

([3]) Petroleum products must not be present in water in such quantities that they:
- form a visible film on the surface of the water or form coatings on the beds of water-courses and lakes,
- impart a detectable 'hydrocarbon' taste to fish,
- produce harmful effects in fish.

PART B: PROPOSED QUALITY STANDARDS

During the stakeholder consultation sessions in Chişinău on 1 and 10 November 2006 it has been requested to propose standards for oil products in the new system of SWQS. The proposed standards have been derived in the following way: the I values of the categories A1 – A3 of the EU Directive 75/440 have been used as the standards for the Use Classe I, II and IV. The standard for Use Class III is set in accordance with the MAC of the HR, 1997.

Proposed quality standards for phenols

unit	Use Class I	Use Class II	Use Class III	Use Class IV	Use Class V
[mg/l]	0.05	0.1	0.5	1	>1

Compliance testing

sampling frequency [-]	statistics for class boundary compliance testing
12 (monthly) or more	95–percentile
less than 12	maximum concentration

SECTION 2: TRACE METALS

The Environmental Quality Standards for the WFD Priority Substances include standards for cadmium, lead, mercury, and nickel (see Annex 2 for more details on the WFD EQS). There are two problems in making these standards operational in the proposed system of SWQS for Moldova:

- For proper use of the standards, the natural background concentration should be incorporated; these are not yet known for Moldovan surface waters

- The standards are defined for *dissolved* concentrations, and partially because of this the concentrations can be quite low. The Annual Average-EQS (hardness Class 3) for cadmium is for instance 0.09 µg/l. Even with modern analytical techniques it will be a problem to analyse at such a low level. And the current laboratory capacity of the major monitoring organisations in Moldova will not be able to analyse at these levels at all.

In order to meet the abovementioned complications, it is proposed to use previously defined EU quality standards for these four trace metals. Details are presented in the data sheets.

Besides the four WFD trace metals, furthermore standards are proposed for copper and zinc, because of inclusion in the Directive 78/659/EEC.

Primer on total and dissolved trace metal concentrations

The various systems of surface water quality standards in Annex 2 and 3 contain standards for trace metals for both dissolved as well as total concentrations. The Directive 78/659/EEC even contains both types: the standards for copper are for the *dissolved* concentration, while the standards for zinc are for the *total* concentration.

There is no general consensus for what would prevail as water quality standards: dissolved or total. Part of this discussion concerns the issue of *bioavailability* of the trace metals. For water consumption by human beings, the dissolved fraction is more relevant (since adsorbed metals mainly remain stuck to particles and thus not will be released into the rest of the human body outside the digestion system). On the other hand, several bottom dwelling organisms (invertebrate macro fauna) actually 'digest' sediment/suspended solids (via which metals become available in the food chain), or can be impacted by exposure to polluted sediment/suspended solids otherwise.

In surface water, trace metals can occur both dissolved in water as well as adsorbed to suspended solids. The *total* concentration of a surface water sample encompasses both matrices, *dissolved* in water plus *adsorbed* in suspended solids. Normally, an equilibrium between the dissolved and the adsorbed fractions exists. This equilibrium depends on several factors:

a) chemical characteristics of the heavy metals ('partition coefficient');
b) physico-chemical conditions of the surface water, like pH and hardness.

In addition, for the total metal concentration furthermore the

c) amount of suspended solids (SS)

in the sample is relevant.

Partition coefficient K

The chemical characteristics are expressed by the partition coefficient K. There are no uniform values for the partition coefficient (partially because of the influence of different physico-chemical conditions). For this Technical Report the partition coefficients applied in the Dutch system of surface water quality standards have been selected. The partition coefficients of a selected number of trace metals are shown in the table below, as well as the calculated fraction dissolved of the total concentration.

Partition coefficients –K- used in The Netherlands; calculated percentage dissolved concentration (with suspended solids SS= 30 mg/l)

	K	*dissolved*
Ni	8	*81%*
As	10	*77%*
Cu	50	*40%*
Zn	110	*23%*
Cd	130	*20%*
Hg	170	*16%*
Cr	290	*10%*
Pb	640	*5%*

The last column illustrates that there can be huge differences for the extent into which metals tend to remain dissolved in the water phase either adsorb to suspended solids.

Suspended solids: standardisation of total concentration

From the tendency to adsorb to suspended solids, it automatically follows that the *amount of suspended solids* also will determine the *total metal concentration* of an unfiltered surface water sample; the more suspended solids in the sample, the higher the total concentration. Therefore, a sample can have high total metal concentrations not because of being more polluted by heavy metals, but simply because of containing more suspended solids.

The Dutch system of water quality standards takes such characteristics of metals into account. The Dutch quality standards for total concentrations of metals in surface waters are defined for surface water containing 30 mg/l suspended solids. Therefore, before checking the compliance with standard, the result first have to be corrected for the amount of suspended solids (= being standardised). For this standardisation, formula (1) applies. In this formula one easily can recognise the partition coefficient K and the factor 30 mg/l for the standard amount of suspended solids.

(1)

$$C_{total,standardised} = C_{total,measured} * \left(\frac{1 + K * \frac{30}{1000}}{1 + K * \frac{SS}{1000}} \right)$$

with:

$C_{total,\ standardised}$ standardised total concentration in [µg/l]

$C_{total,\ measured}$ total concentration as analysed by the laboratory in [µg/l]

K partition coefficient [l/g]

SS measured (analysed) concentration of Suspended Solids of the sample [mg/l]

The lower limit for suspended solids is 10 mg/l. If the measured concentration SS is less than 10 mg/l, for standardisation has set the concentration SS to 10 mg/l.

Not taking into account the amount of suspended solids when interpreting a 'total metal concentration' can lead to serious mistakes in the interpretation of results.

For example. In 1999, during the Tacis "Prut Basin Water Management Project, Moldova", a survey was organised along the Prut River. The total zinc concentration of the surface water sample taken at Girla mare was 50 µg/l. In the Netherlands, the Maximum Allowable Concentration (MAC) for total zinc is 40 µg/l. The result of the laboratory analysis for total zinc in the sample at Girla mare therewith implies that the concentration exceeds the Dutch MAC. But: the concentration of suspended solids of the sample at Girla mare was 880 mg/l. After correcting for this (very high) concentration of suspended solids, the *standardised* concentration is only 2 µg/l!

Method for calculation of total concentrations to dissolved concentrations and vice versa

With the principles mentioned above, one can calculate dissolved concentrations from total concentrations and vice versa. Such calculations are mere approximations. But, at least they allow for coping with situations where standards are defined for total either dissolved concentrations only

Total metal concentration in a surface water sample actually is the result of the sum of:

a) 'solid phase matrix'
   - the concentration of the metal in the suspended solids, in combination with
   - the amount of suspended solids,

plus

b) 'dissolved phase matrix'
   - dissolved metal concentration.

(2) $$C_{total} = C_{'adsorbed''} + C_{dissolved}$$

with:

C_{total} total metal concentration, in [µg/l])
$C_{dissolved}$ metal concentration dissolved in water ('water phase matrix'), in [µg/l]
$C_{'adsorbed'}$ metal concentration of the adsorbed fraction ('solid phase matrix), in **[µg/l]**

The key to the calculations is in the partition coefficient K:

(3) $$K = \frac{C_{SS\_adsorbed}}{C_{dissolved}}$$

with:

$C_{SS\_adsorbed}$ metal concentration in suspended solids ('solid phase matrix'), in [mg/kg]
$C_{dissolved}$ metal concentration dissolved in water ('water phase matrix'), in [mg/m^3]
K partition coefficient, in [m^3/kg]

Equation (3) can be rewritten as:

(4) $$C_{dissolved} = \frac{C_{SS\_adsorbed}}{K}$$

(5) $$C_{'adsorbed''} = C_{SS\_adsorbed} * SS$$

with:

$C_{'adsorbed'}$ metal concentration of the adsorbed fraction(as part of the total concentration), in [µg/l]
$C_{SS\_adsorbed}$ metal concentration in suspended solids ('solid phase matrix'), in [mg/kg]
SS suspended solids concentration of the –unfiltered- surface water sample, in [kg/m^3]
K partition coefficient, in [m^3/kg]

In case a standard has been defined for a total metal concentration only, the standard for the dissolved concentration can be calculated with equation (6)

(6)
$$C_{dissolved} = \frac{C_{total}}{(1 + K * SS)}$$

with:

$C_{dissolved}$	dissolved metal concentration in [µg/l]
C_{total}	total metal concentration in [µg/l]
SS	suspended solids concentration of the (unfiltered) surface water sample, in [kg/m^3]
K	partition coefficient, in [m^3/kg]

If the standard has been defined for the dissolved concentration, then the standard for the total concentration can be calculated with equation (7).

(7)
$$C_{total} = C_{dissolved} * (1 + K * SS)$$

with:

C_{total}	total metal concentration in [µg/l]
$C_{dissolved}$	dissolved metal concentration in [µg/l]
SS	suspended solids concentration of the (unfiltered) surface water sample, in [kg/m^3]
K	partition coefficient, in [m^3/kg]

For the calculations of standards, SS has been set to **30 mg/l (0.03 kg/m^3)**, in accordance with the Dutch system of surface water quality standards.

CADMIUM (CD)

PART A: EXISTING QUALITY STANDARDS

Abstraction of Surface Water for Drinking Water Supply

EU: 75/440/EEC	A1		A2		A3	
	G	I	G	I	G	I
total [µg/l] [(1)]	1	5	1	5	1	5
dissolved [µg/l]	-	-	-	-	-	-

MD: Hygienic Regulation Nr. 06.6.3.23 (1997)	Category I	Category II	Category III	MAC
total [µg/l] [(1)]	-	-	-	1 [(2)]
dissolved [µg/l] [(1)]	-	-	-	

Protection of Fish Life / Fisheries

EU: 78/659/EEC	Salmonid		Cyprinid	
	G	I	G	I
total [µg/l] [(1)]	-	-	-	-
dissolved [µg/l]	-	-	-	-

MD: Rules for Protection of Surface Water (1991)	Super and first class	Second class	MAC
total [µg/l] [(1)]	-	-	5 [(2)]
dissolved [µg/l] [(1)]	-	-	

Bathing Waters / Recreation

EU: 76/160/EEC	G	I
total [µg/l] [(4),(5)]	-	-
dissolved [µg/l]	-	-

MD: Hygienic Regulation Nr. 06.6.3.23 (1997)	(Annex I)	MAC (Annex II)
total [µg/l] [(1)]	-	1 [(2)]
dissolved [µg/l]		

Ambient Standards

EU: 83/513/EEC	MAC
total [µg/l]	5
dissolved [µg/l]	-

EU: WFD ***(inland waters)***	AA-EQS	MAC-EQS
total [µg/l]	-	-
dissolved [µg/l]	≤0.08 (3) 0.08 0.09 0.15 0.25	≤0.45 (3) 0.45 0.6 0.9 1.5

RO: GD 161	Quality class				
	I	II	III	IV	V
total [µg/l]	0.5	1	2	5	>5
dissolved [µg/l]	-	-	-	-	-

ICPDR	Class				
	I	II (TV)	III	IV	V
total [µg/l]	background	1	2	5	>5
dissolved [µg/l]	-	0.1	-	-	-

ECE	Quality class				
	I	II	III	IV	V
total [µg/l] (6)	<0.07	0.07-0.53	0.53-1.1	1.1-3.9	>3.9
dissolved [µg/l]	-	-	-	-	-

Footnotes

(1) document uses [mg/l] as unit

(2) From available documents it is not clear whether the standard applies to dissolved or total copper.

(3) For Cadmium and its compounds, the EQS values vary dependent upon the hardness of the water as specified in five class categories (Class 1: <40 mg $CaCO_3$/l, Class 2: 40 to <50 mg $CaCO_3$/l, Class 3: 50 to <100 mg $CaCO_3$/l, Class 4: 100 to <200 mg $CaCO_3$/l and Class 5: ≥200 mg $CaCO_3$/l).

(4) The annex to 76/160/EEC mentions: heavy metals such as As, Cd, Cr, Pb, Hg

(5) Concentration to be checked by the competent authorities when an inspection in the bathing area shows that the substance may be present or that the quality of the water has deteriorated.

(6) Applicable for hardness from about 0.5 meq/l to 8 meq/l

PART B: PROPOSED QUALITY STANDARDS

Proposed quality standards for Cadmium, Cd

unit	Use Class I	Use Class II	Use Class III	Use Class IV	Use Class V
total [µg/l] (*with SS= 30 mg/l*)	<1 (*or natural background levels*)	1	5	5	>5
dissolved [µg/l]	<0.2 (*or natural background levels*)	0.2(calc)	1(calc)	1(calc)	>1

(calc) calculated; see Primer on total and dissolved trace metal concentrations included at the beginning of this Section.

The proposed standards are derived as follows:

The ambient standard for inland surface waters defined in the Daughter Directive 83/513/EEC is a total concentration of 5 µg/l. This is similar to the I value in the Directive 75/440/EEC. A standard of 5 µg/l is therefore proposed for the Use Classes III and IV. For Use Class II the G value of Directive 75/440/EEC of 1 µg/l is proposed.

Compliance testing

sampling frequency [-]	statistics for class boundary compliance testing
12 (monthly) or more	95–percentile
less than 12	maximum concentration

For compliance testing of the total concentration, the measured concentration first has to be standardised to 30 mg/l Suspended Solids (see Primer on total and dissolved trace metal concentrations included at the beginning of this Section).

LEAD (PB)

PART A: EXISTING QUALITY STANDARDS

Abstraction of Surface Water for Drinking Water Supply

EU: 75/440/EEC	A1		A2		A3	
	G	I	G	I	G	I
total [µg/l] (1)	-	50	-	50	-	50
dissolved [µg/l]	-	-	-	-	-	-

MD: Hygienic Regulation Nr. 06.6.3.23 (1997)	Category I	Category II	Category III	MAC
total [µg/l] (1)	-	-	-	30 (2)
dissolved [µg/l] (1)	-	-	-	

Protection of Fish Life / Fisheries

EU: 78/659/EEC	Salmonid		Cyprinid	
	G	I	G	I
total [µg/l] (1)	-	-	-	-
dissolved [µg/l]	-	-	-	-

MD: Rules for Protection of Surface Water (1991)	Super and first class	Second class	MAC
total [µg/l] (1)	-	-	100 (2)
dissolved [µg/l] (1)	-	-	

Bathing Waters / Recreation

EU: 76/160/EEC	G	I
total [µg/l] (3),(4)	-	-
dissolved [µg/l]	-	-

MD: Hygienic Regulation Nr. 06.6.3.23 (1997)	(Annex I)	MAC (Annex II)
total [µg/l] (1)	-	30 (2)
dissolved [µg/l]		

Ambient Standards

EU: 76/464/EEC	MAC
total [µg/l]	-
dissolved [µg/l]	-

EU: WFD ***(inland waters)***	AA-EQS	MAC-EQS
total [µg/l]	-	-
dissolved [µg/l]	7.2	not applicable

RO: GD 161	Quality class				
	I	II	III	IV	V
total [µg/l]	5	10	25	50	>50
dissolved [µg/l]	-	-	-	-	-

ICPDR	Class				
	I	II (TV)	III	IV	V
total [µg/l]	background	5	10	25	>25
dissolved [µg/l]	-	1	-	-	-

ECE	Quality class				
	I	II	III	IV	V
total [µg/l] [(5)]	<0.1	0.1-1.6	1.6-3.2	3.2-82	>82
dissolved [µg/l]	-	-	-	-	-

Footnotes

[(1)] document uses [mg/l] as unit
[(2)] From available documents it is not clear whether the standard applies to dissolved or total copper.
[(3)] The annex to 76/160/EEC mentions: heavy metals such as As, Cd, Cr, Pb, Hg
[(4)] Concentration to be checked by the competent authorities when an inspection in the bathing area shows that the substance may be present or that the quality of the water has deteriorated.
[(5)] Applicable for hardness from about 0.5 meq/l to 8 meq/l

PART B: PROPOSED QUALITY STANDARDS

Proposed quality standards for Lead, Pb

unit	Use Class I	Use Class II	Use Class III	Use Class IV	Use Class V
total [µg/l] (*with SS= 30 mg/l*)	<50 (*or natural background levels*)	50	50	50	>50
dissolved [µg/l]	<2.5 (*or natural background levels*)	2.5[(calc)]	2.5[(calc)]	2.5[(calc)]	>2.5

[(calc)] calculated; see Primer on total and dissolved trace metal concentrations included at the beginning of this Section.

The proposed standards are derived as follows:

- There are no standards defined for lead in the Directive 76/464/EEC or its Daughter Directives. Only the Directive 75/440/EEC contains standards for lead with I values for all three categories of 50 µg/l.

- When calculating the dissolved concentration from 50 µg/l, the resulting concentration is 2.5 µg/l. This is lower than the WFD AA-EQS! The substance data sheet for lead indicates that there are some complications with deriving the EQS. It mentions that the Maximum Permissible Admission concentration for the Rhine as example is 2.3 µg/l http://forum.europa.eu.int/Public/irc/env/wfd/library?l=/framework_directive/i-priority_substances/supporting_background&vm=detailed&sb=Title

- It nevertheless is proposed to follow the I values of the Directive 75/440/EEC, but the notice above should be taken into account.

Compliance testing

sampling frequency [-]	statistics for class boundary compliance testing
12 (monthly) or more	95–percentile
less than 12	maximum concentration

For compliance testing of the total concentration, the measured concentration first has to be standardised to 30 mg/l Suspended Solids (see Primer on total and dissolved trace metal concentrations included at the beginning of this Section).

MERCURY (HG)

PART A: EXISTING QUALITY STANDARDS

Abstraction of Surface Water for Drinking Water Supply

EU: 75/440/EEC	A1		A2		A3	
	G	I	G	I	G	I
total [µg/l] (1)	0.5	1	0.5	1	0.5	1
dissolved [µg/l]	-	-	-	-	-	-

MD: Hygienic Regulation Nr. 06.6.3.23 (1997)	Category I	Category II	Category III	MAC
total [µg/l](1)	-	-	-	0.5 (2)
dissolved [µg/l] (1)	-	-	-	

Protection of Fish Life / Fisheries

EU: 78/659/EEC	Salmonid		Cyprinid	
	G	I	G	I
total [µg/l] (1)	-	-	-	-
dissolved [µg/l]	-	-	-	-

MD: Rules for Protection of Surface Water (1991)	Super and first class	Second class	MAC
total [µg/l] (1)	-	-	0.01 (2)
dissolved [µg/l] (1)	-	-	

Bathing Waters / Recreation

EU: 76/160/EEC	G	I
total [µg/l] (3),(4)	-	-
dissolved [µg/l]	-	-

MD: Hygienic Regulation Nr. 06.6.3.23 (1997)	(Annex I)	MAC (Annex II)
total [µg/l] (1)	-	0.5 (2)
dissolved [µg/l]		

Ambient Standards

EU: 82/176/EEC	MAC
total [µg/l]	1
dissolved [µg/l]	-

EU: WFD ***(inland waters)***	AA-EQS	MAC-EQS
total [µg/l]	-	-
dissolved [µg/l]	0.05	0.07

RO: GD 161	Quality class				
	I	II	III	IV	V
total [µg/l]	0.1	0.3	0.5	1	>1
dissolved [µg/l]	-	-	-	-	-

ICPDR	Class

	I	II (TV)	III	IV	V
total [µg/l]	background	0.1	0.2	0.5	>0.5
dissolved [µg/l]	-	0.1	-	-	-

ECE	Quality class				
	I	II	III	IV	V
total [µg/l] [(5)]	<0.003	0.003-0.007	0.007-0.012	0.012-2.4	>2.4
dissolved [µg/l]	-	-	-	-	-

Footnotes

[(1)] document uses [mg/l] as unit
[(2)] From available documents it is not clear whether the standard applies to dissolved or total copper.
[(3)] The annex to 76/160/EEC mentions: heavy metals such as As, Cd, Cr, Pb, Hg
[(4)] Concentration to be checked by the competent authorities when an inspection in the bathing area shows that the substance may be present or that the quality of the water has deteriorated.
[(5)] Applicable for hardness from about 0.5 meq/l to 8 meq/l

PART B: PROPOSED QUALITY STANDARDS

Proposed quality standards for Mercury, Hg

unit	Use Class I	Use Class II	Use Class III	Use Class IV	Use Class V
total [µg/l] (*with SS= 30 mg/l*)	<1 (*or natural background levels*)	1	1	1	>1
dissolved [µg/l]	<0.2 (*or natural background levels*)	0.2[(calc)]	0.2[(calc)]	0.2[(calc)]	>0.2

(calc) calculated; see Primer on total and dissolved trace metal concentrations included at the beginning of this Section.

The proposed standards are derived as follows:

The I values of the Directive 75/440/EEC are the same concentration as the quality objective of the Daughter Directive 82/176/EEC. It is proposed to apply this standards to the Use Classes II – IV.

Compliance testing

sampling frequency [-]	statistics for class boundary compliance testing
12 (monthly) or more	95–percentile
less than 12	maximum concentration

For compliance testing of the total concentration, the measured concentration first has to be standardised to 30 mg/l Suspended Solids (see Primer on total and dissolved trace metal concentrations included at the end of this Section).

NICKEL (Ni)

PART A: EXISTING QUALITY STANDARDS

Abstraction of Surface Water for Drinking Water Supply

EU: 75/440/EEC	A1		A2		A3	
	G	I	G	I	G	I
total [µg/l] (1)	-	-	-	-	-	-
dissolved [µg/l]	-	-	-	-	-	-

MD: Hygienic Regulation Nr. 06.6.3.23 (1997)	Category I	Category II	Category III	MAC
total [µg/l](1)	-	-	-	100 (2)
dissolved [µg/l](1)	-	-	-	

Protection of Fish Life / Fisheries

EU: 78/659/EEC	Salmonid		Cyprinid	
	G	I	G	I
total [µg/l] (1)	-	-	-	-
dissolved [µg/l]	-	-	-	-

MD: Rules for Protection of Surface Water (1991)	Super and first class	Second class	MAC
total [µg/l] (1)	-	-	10 (2)
dissolved [µg/l](1)	-	-	

Bathing Waters / Recreation

EU: 76/160/EEC	G	I
total [µg/l] (3),(4)	-	-
dissolved [µg/l]	-	-

MD: Hygienic Regulation Nr. 06.6.3.23 (1997)	(Annex I)	MAC (Annex II)
total [µg/l] (1)	-	100 (2)
dissolved [µg/l]		

Ambient Standards

EU: 76/464/EEC	MAC
total [µg/l]	-
dissolved [µg/l]	-

EU: WFD ***(inland waters)***	AA-EQS	MAC-EQS
total [µg/l]	-	-
dissolved [µg/l]	20	*not applicable*

RO: GD 161	Quality class				
	I	II	III	IV	V
total [µg/l]	10	25	50	100	>100
dissolved [µg/l]	-	-	-	-	-

ICPDR	Class				
	I	II (TV)	III	IV	V

total [µg/l]	background	50	100	250	>250
dissolved [µg/l]	-	1	-	-	-

ECE	Quality class				
	I	II	III	IV	V
total [µg/l] [(5)]	<15	15-87	87-160	160-1400	>1400
dissolved [µg/l]	-	-	-	-	-

Footnotes

[(1)] document uses [mg/l] as unit
[(2)] From available documents it is not clear whether the standard applies to dissolved or total copper.
[(3)] The annex to 76/160/EEC mentions: heavy metals such as As, Cd, Cr, Pb, Hg
[(4)] Concentration to be checked by the competent authorities when an inspection in the bathing area shows that the substance may be present or that the quality of the water has deteriorated.
[(5)] Applicable for hardness from about 0.5 meq/l to 8 meq/l

PART B: PROPOSED QUALITY STANDARDS

Proposed quality standards for Nickel, Ni

unit	Use Class I	Use Class II	Use Class III	Use Class IV	Use Class V
total [µg/l] (*with SS= 30 mg/l*)	10 (*or natural background levels*)	25	50	100	>100
dissolved [µg/l]	8[(calc)] (*or natural background levels*)	20[(calc)]	40[(calc)]	80[(calc)]	>80

(calc) calculated; see Primer on total and dissolved trace metal concentrations included at the beginning of this Section.

The proposed standards are derived as follows:

- Interestingly, no actual concentrations are defined for nickel in the Directives 75/440/EEC or 76/464/EEC and its Daughter Directives.

- The WFD EQS are only defined for the (Annual Average) AA-EQS which represents the annual mean concentration. A dissolved concentration of nickel of 20 µg/l would tentatively compare with a total concentration of 25 µg/l.

- Because of the lack of sufficient alternative EU standards, it is proposed to include the Romanian GD 161 standards.

Compliance testing

sampling frequency [-]	statistics for class boundary compliance testing
12 (monthly) or more	95–percentile
less than 12	maximum concentration

For compliance testing of the total concentration, the measured concentration first has to be standardised to 30 mg/l Suspended Solids (see Primer on total and dissolved trace metal concentrations included at the beginning of this Section).

COPPER (CU)

PART A: EXISTING QUALITY STANDARDS

Abstraction of Surface Water for Drinking Water Supply

EU: 75/440/EEC	A1		A2		A3	
	G	I	G	I	G	I
total [µg/l] [(1)]	20	50 [(O)]	50	-	1000	-
dissolved [µg/l]	-	-	-	-	-	-

MD: Hygienic Regulation Nr. 06.6.3.23 (1997)	Category I	Category II	Category III	MAC
total [µg/l] [(1)]	-	-	-	1000 [(2)]
dissolved [µg/l] [(1)]	-	-	-	

Protection of Fish Life / Fisheries

EU: 78/659/EEC	Salmonid		Cyprinid	
	G	I	G	I
total [µg/l] [(1)]	-	-	-	-
dissolved [µg/l]	≤400 (at 100 mg/l $CaCO_3$) [(3)]	-	≤40 (at 100 mg/l $CaCO_3$) [(3)]	-

MD: Rules for Protection of Surface Water (1991)	Super and first class	Second class	MAC
total [µg/l] [(1)]	-	-	1 [(2)]
dissolved [µg/l] [(1)]	-	-	

Bathing Waters / Recreation

MD: Hygienic Regulation Nr. 06.6.3.23 (1997)	(Annex I)	MAC (Annex II)
total [µg/l] [(1)]	-	1000 [(2)]
dissolved [µg/l]		

Ambient Standards

WFD (inland waters)	AA-EQS	MAC-EQS
total [µg/l] [(1)]	-	-
dissolved [µg/l]	-	-

RO: GD 161	Quality class				
	I	II	III	IV	V
total [µg/l]	20	30	50	100	>100
dissolved [µg/l]	-	-	-	-	-

ICPDR	Class				
	I	II (TV)	III	IV	V
total [µg/l]	background	20	40	100	>100
dissolved [µg/l]	-	2	-	-	-

ECE	Quality class				
	I	II	III	IV	V
total [µg/l] (6)	<2	2-7	7-12	12-18	>18
dissolved [µg/l]	-	-	-	-	-

Footnotes

(1) document uses [mg/l] as unit

(2) From available documents it is not clear whether the standard applies to dissolved or total copper.

(3) Annex II: Particulars regarding total zinc and dissolved copper "*Dissolved copper concentrations for different water hardness values between 10 and 3500 mg/l $CaCO_3$:*

	Water hardness (mg/l $CaCO_3$)			
	10	*50*	*100*	*300*
[µg/l] Cu	5*	22	40	112

* the presence of fish in waters containing higher concentrations of copper may indicate a predominance of dissolved organo-cupric complexes.

(4) The annex to 76/160/EEC mentions: heavy metals such as As, Cd, Cr, Pb, Hg

(5) Concentration to be checked by the competent authorities when an inspection in the bathing area shows that the substance may be present or that the quality of the water has deteriorated.

(6) Applicable for hardness from about 0.5 meq/l to 8 meq/l

(O) Exceptional climatic or geographical conditions

PART B: PROPOSED QUALITY STANDARDS

Proposed quality standards for Copper, Cu

unit	Use Class I	Use Class II	Use Class III	Use Class IV	Use Class V
total [µg/l] (*with SS= 30 mg/l*)	<50 (*or natural background levels*)	50	100(calc)	1000	>1000
dissolved [µg/l]	<20 (*or natural background levels*)	20(calc)	40	400(calc)	>400

(calc) calculated; see Primer on total and dissolved trace metal concentrations included at the beginning of this Section.

The proposed standards are derived as follows:

- the boundary concentration for Use Class II is set to the I value of the Directive 75/440/EEC
- the boundary concentration for Use Class III is set to the G value of the Directive 78/659/EEC
- the boundary concentration for Use Class IV is set to the G value of category A3 of the Directive 75/440/EEC

Contrary to the Directive 78/659/EEC, no further differentiation for hardness classes has been made. In case the hardness of Moldovan surface waters would substantially differ from 100 mg/l $CaCO_3$, then the ranges included in Annex II of the Directive 78/659/EEC can be used for adjusting the standards.

Compared to the current Moldovan standards, the proposed standards are less stringent for waters to be used for fish-farming. In the case of abstraction of drinking water, the standards of Use Classes II and III are more stringent than the current MAC.

Compliance testing

sampling frequency [-]	statistics for class boundary compliance testing
12 (monthly) or more	95–percentile
less than 12	maximum concentration

For compliance testing of the total concentration, the measured concentration first has to be standardised to 30 mg/l Suspended Solids (see Primer on total and dissolved trace metal concentrations included at the beginning of this Section).

ZINC (ZN)

PART A: EXISTING QUALITY STANDARDS

Abstraction of Surface Water for Drinking Water Supply

EU: 75/440/EEC	A1		A2		A3	
	G	I	G	I	G	I
total [µg/l] (1)	500	3000	1000	5000	1000	5000
dissolved [µg/l]	-	-	-	-	-	-

MD: Hygienic Regulation Nr. 06.6.3.23 (1997)	Category I	Category II	Category III	MAC
total [µg/l] (1)	-	-	-	1000 (2)
dissolved [µg/l] (1)	-	-	-	

Protection of Fish Life / Fisheries

EU: 78/659/EEC	Salmonid		Cyprinid	
	G	I	G	I
total [µg/l] (1)	-	≤300 (at 100 mg/l $CaCO_3$) (3)	-	≤1000 (at 100 mg/l $CaCO_3$) (3)
dissolved [µg/l]	-	-	-	-

MD: Rules for Protection of Surface Water (1991)	Super and first class	Second class	MAC
total [µg/l] (1)	-	-	10(2)
dissolved [µg/l] (1)	-	-	

Bathing Waters / Recreation

EU: 76/160/EEC	G	I
total [µg/l] (4),(5)	-	-
dissolved [µg/l]	-	-

MD: Hygienic Regulation Nr. 06.6.3.23 (1997)	(Annex I)	MAC (Annex II)
total [µg/l] (1)	-	1000 (2)
dissolved [µg/l]	-	

Ambient Standards

RO: GD 161	Quality class				
	I	II	III	IV	V
total [µg/l]	100	200	500	1000	>1000
dissolved [µg/l]	-	-	-	-	-

ICPDR	Class				
	I	II (TV)	III	IV	V
total [µg/l]	background	100	200	500	>500
dissolved [µg/l]	-	5	-	-	-

ECE	Quality class				
	I	II	III	IV	V
total [µg/l] [6]	<45	45 – 77	77 – 110	110 – 120	>120
dissolved [µg/l]	-	-	-	-	-

Footnotes

[1] original document uses [mg/l] as unit

[2] From available documents it is not clear whether the standard applies to dissolved or total zinc

[3] Annex II: Particulars regarding total zinc and dissolved copper: "*Zinc concentrations for different water hardness values between 10 and 500 mg/l $CaCO_3$:*

	Water hardness (mg/l $CaCO_3$)			
	10	*50*	*100*	*500*
Salmonid waters ([µg/l Zn)	30	200	300	500
Cyprinid waters ([µg/l Zn)	300	700	1000	2000

[4] The annex to 76/160/EEC mentions: heavy metals such as As, Cd, Cr, Pb, Hg

[5] Concentration to be checked by the competent authorities when an inspection in the bathing area shows that the substance may be present or that the quality of the water has deteriorated.

[6] Applicable for hardness from about 0.5 meq/l to 8 meq/l

PART B: PROPOSED QUALITY STANDARDS

Proposed quality standards for Zinc, Zn

unit	Use Class I	Use Class II	Use Class III	Use Class IV	Use Class V
total [µg/l] (*with SS= 30 mg/l*)	<300 (*or natural background levels*)	300	1000	5000	>5000
dissolved [µg/l]	<70[(calc)] (*or natural background levels*)	70[(calc)]	233[(calc)]	1163[(calc)]	>1163

[(calc)] calculated; see Primer on total and dissolved trace metal concentrations included at the beginning of this Section.

The proposed standards are derived as follows:

- the boundary concentrations for Use Classes II and III are set in accordance with the I values of the Directive 78/659/EEC for respectively salmonid and cyprinid waters
- the boundary concentration for Use Class IV is set to the I value of category A3 of the Directive 75/440/EEC

Contrary to the Directive 78/659/EEC, no further differentiation for hardness classes has been made. In case the hardness of Moldovan surface waters would substantially differ from 100 mg/l $CaCO_3$, then the ranges included in Annex II of the Directive 78/659/EEC can be used for adjusting the standards.

Compared to the current Moldovan standards, the proposed standards are less stringent for waters to be used for fish farming. The boundary concentration of Use Class IV is higher than the current MAC for the abstraction of drinking water.

Compliance testing

sampling frequency [-]	statistics for class boundary compliance testing
12 (monthly) or more	95–percentile
less than 12	maximum concentration

For compliance testing of the total concentration, the measured concentration first has to be standardised to 30 mg/l Suspended Solids (see Primer on total and dissolved trace metal concentrations included at the beginning of this Section).

SECTION 3: BACTERIOLOGICAL PARAMETERS

TOTAL COLIFORMS 37^0 C

PART A: EXISTING QUALITY STANDARDS

Abstraction of Surface Water for Drinking Water Supply

EU: 75/440/EC	A1		A2		A3	
	G	I	G	I	G	I
No./100 ml	50	-	5 000	-	50 000	-

MD: Hygienic regulation Nr. 06.6.3.23	Category I	Category II	Category III	MAC
No./100 ml	100	1 000	5 000	

Fisheries / Protection of Fish Life

EU: 78/659/EC	Salmonid		Cyprinid	
	G	I	G	I
No./100 ml	-	-	-	-

MD: Rules for protection of Surface Water 1991	Super and first class	Second class	MAC
No./100 ml			-

Bathing Waters / Recreation/Irrigation

EU: 76/160/EC	G	I
No./100 ml	50	10 000
	500	-

MD: Hygienic regulation Nr. 06.6.3.23		
No./100 ml	5 000	-

Ambient Standards

RO: GD 161	Quality class				
	I	II	III	IV	V
No./100 ml	-	-	-	-	-

ICPDR	Class				
	I	II	III	IV	V
No./100 ml	-	-	-	-	-

ECE	Quality class				
	I	II	III	IV	V
No./100 ml	-	-	-	-	-

PART B: PROPOSED QUALITY STANDARDS

The EU regulation states that only for bathing and drinking purpose, this parameter is necessary. In EU WFD also it is stated that the aquatic ecosystems can have their own level of microbiology without affecting ecosystem life.

Total coliforms 37 ^{0}C is not needed by fish and other aquatic organisms for their good health but it is important for human health, both when is about drinking water, raw water intended for drinking purpose and for bathing, meaning both direct and indirect use for human needs and therewith is an important ecological parameter. Lower the content is, better for human health. The parameter indicates total species of coliforms being able to survive and develop into human body at normal human body temperature and means the parameter bearing “water born disease”. Very low contents as such are not directly jeopardise uses like production of drinking water but increasing levels indicates different levels of treatment, meaning chlorine input in water treatment process. Higher the outside temperature is, bigger quantity of chlorine is necessary, but this disturbs the smell and general quality of water treated. Also, higher content of residual chlorine increase the risk of carcinogenic characteristics of drinking water because of free chlorine radicals. Low content of total coliforms does not bother so much recreation water, but can indicate pollution stresses during bathing season. Total coliforms are measured my means of adequate growing medium. The water sample is seeded on the medium and the presence and/or absence as well as the number of coli. The method is European accepted, ISO method.

Although the EU Directives 75/440/EC and 76/160/EEC only contain quality standards for total coliforms, the region of ICPDR and ECE does not contain provisions for such parameter. Normally, it is considered that this parameter can be naturally present in surface water in a certain level, being harmless for other alive organism than human beings al low number of colonies, coming from natural background.

The proposed standards mainly follow the standards of the EU 75/440/EEC and 76/160/EEC Directives and have been incorporated as following. The class I and II values comply with the G values for class A1 and A2 for raw water intended for drinking purpose, but also for class III from hygienic regulation from Moldova. The class III comply with Indicative value for bathing waters; the class IV comply with G value for class A3 from 75/440/EEC Directive.

Compared to the current Moldovan standards (Hygienic regulation) water bodies with total coliforms from class I and II are more severe that the proposed standards. Actually, the proposed class II standard comply with class III from Moldovan Regulation, meaning that what was before considered class III can be included now in class II, similar with “good quality water”.

Waters corresponding to the class V are “any value bigger than class IV”, referring mainly at the “waste waters category” but not only.

Proposed quality standards for Coliforms total

Proposal	Class				
	I	II	III	IV	V
No./100 ml	500	5 000	10 000	50 000	-

Compliance testing

sampling frequency [-]	statistics for class boundary compliance testing
12 (monthly) or more	95–percentile
less than 12	maximum concentration

FAECAL COLIFORMS

PART A: EXISTING QUALITY STANDARDS

Abstraction of Surface Water for Drinking Water Supply

EU: 75/440/EC	A1		A2		A3	
	G	I	G	I	G	I
No./100 ml	50	-	2 000	-	20 000	-

MD: Hygienic regulation Nr. 06.6.3.23	Category I	Category II	Category III	MAC
No./100 ml	100	1 000	5 000	

Fisheries / Protection of Fish Life

EU: 78/659/EC	Salmonid		Cyprinid	
	G	I	G	I
No./100 ml	-	-	-	-

MD: Rules for protection of Surface Water 1991	Super and first class	Second class	MAC
No./100 ml			

Bathing Waters / Recreation/Irrigation

EU: 76/160/EC	G	I
No./100 ml	100	2 000
	500	-

MD: Hygienic regulation Nr. 06.6.3.23		
No./100 ml		-

Ambient Standards

RO: GD 161	Quality class				
	I	II	III	IV	V
	-	-	-	-	-

ICPDR	Class				
	I	II	III	IV	V
	-	-	-	-	-

ECE	Quality class				
	I	II	III	IV	V
	-	-	-	-	-

PART B: PROPOSED QUALITY STANDARDS

The EU regulations state that only for bathing and drinking purpose, this parameter is necessary. In EU WFD, it is also stated that the aquatic ecosystems can have their own level of microbiology without affecting ecosystem life.

Faecal coliforms is not needed by fish and other aquatic organisms for their good health but it is important for human health, both when is about drinking water, raw water intended for drinking purpose and for bathing purpose, meaning both direct and indirect use for human needs and therewith is an important ecological parameter. Lower the content is, better for human health. The parameter indicates total species of faecal coli coming both from human and animal intestinal activity being able to affect internal function of human body (digestive system, kidneys, immunological system) in case of ingestion of polluted water and means the parameter bearing "imuno-suppresor disease" from a certain level of concentration. Very low contents as such are not directly jeopardise uses like production of drinking water but increasing levels indicates different levels of treatment, meaning chlorine input in water treatment process. Higher the outside temperature is bigger quantity of chlorine is necessary, but this exceeding chlorine disturbs the smell and general quality of water treated. Also, higher content of residual chlorine increase the risk of carcinogenic characteristics of drinking water because of free chlorine radicals. Very low content of faecal coliforms does not bother so much recreation water, but can indicate pollution stresses during bathing season. Faecal coliforms are measured my means of adequate growing medium. The water sample is seeded on the medium and the presence and/or absence as well as the number of coli. The method was used to be European accepted, ISO method but being changed lately by a more specific method for intestinal enterococci with only human origin.

Although the EU Directives 75/440/EC and 76/160/EEC only contain quality standards for faecal coliforms, the region of ICPDR and ECE does not contain provisions for such parameter. Neither Romania adopted any more such parameter for monitoring of surface water (GD 161/2006). Normally, it is considered that this parameter can be present in surface water in a certain level coming from animal and human digestive system, being harmless for other organism than human beings at low number of colonies.

The proposed standards mainly follow the standards of the EU 75/440/EEC and 76/160/EEC Directives and have been incorporated as following. The class I value is bigger than the G values for class A1 (covering completely the directive value) and is identical with Class I from Moldovan Hygienic Regulation. Class II is identical with G value for Class A2 and indicative value for bathing water, meaning good quality water with medium level of treatment for raw water intended for drinking purpose and more generous level (twice bigger) than Class II from Moldovan Hygienic Regulation. The class III is twice less severe than G value fro class III for raw water, meaning less severe quantity of chlorine treatment. Class IV from the new proposal complies with class IV comply with G value for class A3 from 75/440/EEC Directive. The proposed values meet the most stringent value from the hygienic regulation but also requirement for raw water and bathing waters from European Directives.

Compared to the current Moldovan standards (Hygienic regulation) water bodies with total coliforms from class II are more relaxed that the proposed standards. Actually, the proposed class II and class III standard will include waters which were before included in class III and class IV, minimising the water category included in "degraded water".

Waters corresponding to the class V are "any value bigger than class IV", referring mainly at any other waters than class I-IV including also some of the "waste waters category".

Proposed quality standards for Faecal Coliforms

Proposal	Class				
	I	II	III	IV	V
No./100ml	100	2 000	10 000	20 000	-

Compliance testing

sampling frequency [-]	statistics for class boundary compliance testing
12 (monthly) or more	95–percentile
less than 12	maximum concentration

FAECAL STREPTOCCOCI

PART A: EXISTING QUALITY STANDARDS

Abstraction of Surface Water for Drinking Water Supply

EU: 75/440/EC	A1		A2		A3	
	G	I	G	I	G	I
No./100 ml	20	-	1 000	-	10 000	-

MD: Hygienic regulation Nr. 06.6.3.23	Category I	Category II	Category III	MAC
No./100 ml	-	-	-	-

Fisheries / Protection of Fish Life

EU: 78/659/EC	Salmonid		Cyprinid	
	G	I	G	I
No./100 ml	-	-	-	-

MD: Rules for protection of Surface Water 1991	Super and first class	Second class	MAC
No./100 ml			

Bathing Waters / Recreation/Irrigation

EU: 76/160/EC	G	I
No./100 ml	100	-

MD: Hygienic regulation Nr. 06.6.3.23		
No./100 ml	-	-

Ambient Standards

RO: GD 161	Quality class				
	I	II	III	IV	V
	-	-	-	-	-

ICPDR	Class				
	I	II	III	IV	V
	-	-	-	-	-

ECE	Quality class				
	I	II	III	IV	V
	-	-	-	-	-

PART B: PROPOSED QUALITY STANDARDS

The EU regulations state that only for bathing and drinking purpose, this parameter is necessary. In EU WFD, it is also stated that the aquatic ecosystems can have their own level of microbiology without affecting ecosystem life.

Faecal streptococci is not needed by fish and other aquatic organisms for their good health but it is important for human health, both when is about drinking water, raw water intended for drinking purpose and for bathing purpose as an obligatory parameter, meaning both direct and indirect use for human needs and therewith is an important ecological parameter. Lower the content is, better for human health. The parameter indicates total species of faecal cocci coming from human intestinal activity being able to affect internal function of human body (digestive system, kidneys, immunological system) in case of ingestion of polluted water and means the parameter bearing "imuno-suppresor disease" from a certain level of concentration. Very low contents as such are not directly jeopardise uses like production of drinking water but increasing levels indicates different levels of treatment, meaning chlorine input in water treatment process. Higher the quantity is bigger quantity of chlorine is necessary, but this exceeding chlorine disturbs the smell and general quality of water treated. Also, higher content of residual chlorine increase the risk of carcinogenic characteristics of drinking water because of free chlorine radicals. Very low content of faecal cocci does not bother so much recreation water, but can indicate pollution stresses during bathing season. Faecal cocci are measured my means of adequate growing medium. The water sample is seeded on the medium and the presence and/or absence as well as the number of cocci. The method was used to be European accepted, ISO method but being changed lately by a more specific method for intestinal enterococci with only human origin.

Although the EU Directives 75/440/EC and 76/160/EEC only contain quality standards for faecal cocci, the region of ICPDR and ECE does not contain provisions for such parameter. Neither Romania adopted any more such parameter for monitoring of surface water (GD 161/2006). Normally, it is considered that this parameter can be present in surface water in a certain level coming from animal and human digestive system, being harmless for other organism than human beings at low number of colonies.

The proposed standards mainly follow the standards of the EU 75/440/EEC and 76/160/EEC Directives and have been incorporated as following. The class I value comply with the G values for class A1. Class II is identical with G value for Class A2 and covers obligatory value for bathing water, meaning good quality water with medium level of treatment for raw water intended for drinking purpose. The class III is twice less severe than G value fro class III for raw water, meaning less severe quantity of chlorine treatment. Class IV from the new proposal complies with G value for class A3 from 75/440/EEC Directive. The proposed values does not meet any value from the hygienic regulation but covers the obligatory requirements for raw water and bathing waters from European Directives.

Compared to the current Moldovan standards, it is easily seen that, up to now, this parameter was not measured in Moldova.

Waters corresponding to the class V are "any value bigger than class IV", referring mainly at any other waters than class I-IV including also some of the "waste waters category".

Proposed quality standards for Faecal Streptococci

Proposal	Class				
	I	II	III	IV	V
No./100ml	20	1 000	5 000	10 000	-

Compliance testing

sampling frequency [-]	statistics for class boundary compliance testing
12 (monthly) or more	95–percentile
less than 12	maximum concentration

SALMONNELA

PART A: EXISTING QUALITY STANDARDS

Abstraction of Surface Water for Drinking Water Supply

EU: 75/440/EC	A1		A2		A3	
	G	I	G	I	G	I
No./100 ml	-	-	-	-	-	-

MD: Hygienic regulation Nr. 06.6.3.23	Category I	Category II	Category III	MAC
No./100 ml				

Fisheries / Protection of Fish Life

EU: 78/659/EC	Salmonid		Cyprinid	
	G	I	G	I
No./100 ml	-	-	-	-

MD: Rules for protection of Surface Water 1991	Super and first class	Second class	MAC
No./100 ml			

Bathing Waters / Recreation

EU: 76/160/EC	G	I
No./100 ml	-	0

MD: Hygienic regulation Nr. 06.6.3.23		
No./100 ml		

Ambient Standards

RO: GD 161	Quality class				
	I	II	III	IV	V
	-	-	-	-	-

ICPDR	Class				
	I	II	III	IV	V
	-	-	-	-	-

ECE	Quality class				
	I	II	III	IV	V
	-	-	-	-	-

PART B: PROPOSED QUALITY STANDARDS

It is regulated only for bathing/recreational purpose at EU level for indicative level, not for mandatory (G) and for drinking water (after treatment) not for surface waters.

It is not regulated and monitored in Romania and at ICPDR level.

It is regulated in Romania for drinking water and monitored only by human health authorities with ‘’0‘’ value for all 5 classes.

Not regulated yet in Moldovan standards.

It is proposed not to be introduced in new Moldova WQS for monitoring of surface waters.

ENTEROVIRUSES

PART A: EXISTING QUALITY STANDARDS

Abstraction of Surface Water for Drinking Water Supply

EU: 75/440/EC	A1		A2		A3	
	G	I	G	I	G	I
No./100 ml	-	-	-	-	-	-

MD: Hygienic regulation Nr. 06.6.3.23	Category I	Category II	Category III	MAC
No./100 ml				

Fisheries / Protection of Fish Life

EU: 78/659/EC	Salmonid		Cyprinid	
	G	I	G	I
No./100 ml	-	-	-	-

MD: Rules for protection of Surface Water 1991	Super and first class	Second class	MAC
No./100 ml			

Bathing Waters / Recreation

EU: 76/160/EC	G	I
No./100 ml	50	10 000
	-	0

MD: Hygienic regulation Nr. 06.6.3.23		
No./100 ml		-

Ambient Standards

RO: GD 161	Quality class				
	I	II	III	IV	V
	-	-	-	-	-

ICPDR	Class				
	I	II	III	IV	V
	-	-	-	-	-

ECE	Quality class				
	I	II	III	IV	V
	-	-	-	-	-

PART B: PROPOSED QUALITY STANDARDS

Enteroviruses is regulated only for bathing/recreational purpose at EU level for indicative level with ‘’0‘’ value, not for mandatory (G) and for drinking water (after treatment), but not for surface waters.

It is not regulated and monitored in Romania and at ICPDR level in surface waters.

It is regulated in Romania for drinking water and monitored only by human health authorities with ‘’0‘’ value for all 5 classes.

Not regulated yet in Moldovan standards.

It is proposed not to be introduced in new Moldova WQS for monitoring of surface waters.

“**Lacto positive coli”** and **“Colifagi”,** as well as **“Ovum of helmintes’’** can not be found in European legislation, ICPDR or UN ECE regulations, being saprophyte microbiological parameters in certain circumstances. They pose a risk for human health from direct (drinking water) or indirect activities (bathing/recreation). As a matter of fact, **“Lacto positive coli”** and **“Colifagi”** are normally included in “total coliforms”, according to European analysis methods.

An increased attention should be paid to parameter ***“Intestinal enterococci”,*** taking into account that it appears as a new parameter in the Bathing water Directive. From scientific point of view, this new parameter reflects better the impact of human activity as well as the potential danger upon human life. Animals or other alive organisms (plans, fish, etc.) must be taken into consideration when assessing ecological status, based on biological parameters and not microbiological ones. Also, the new ISO analysis method includes considerations upon this aspect and the old ISO method is replaced by new one, focused mainly on this parameter.

It is also recommended to adopt as soon as possible these European analysis methods that offer an integrated picture of microbiological risk, rather than the present Moldovan parameters. Also, this should a task only for Sanepid laboratories and not for Hydromet or Ecological Inspectorate, who should eliminate the analysis from their normal monitoring, re-allocating the rooms and staff for future increasingly necessities.

For class V –- bigger than class 4 of a line (as a matter of fact bad class can be worse than class 4).

Salmonella, enterovirusis, ovums of helmintes - absent for all 5 classes.

ANNEX 2

EU DIRECTIVES: QUALITY STANDARDS AND ACCOMPANYING INFORMATION

DIRECTIVE 75/440/EEC CONCERNING THE QUALITY REQUIRED OF SURFACE WATER INTENDED FOR THE ABSTRACTION OF DRINKING WATER

ANNEX II: Characteristics of surface water intended for the abstraction of drinking water

	Parameters		A1 G	A1 I	A2 G	A2 I	A3 G	A3 I
1	pH		6.5 to 8.5		5.5 to 9		5.5 to 9	
2	Coloration (after simple filtration) scale	mg/1 Pt	10	20(O)	50	100 (O)	50	200 (O)
3	Total suspended solids	mg/1 SS	25					
4	Temperature	°C	22	25 (O)	22	25 (0)	22	25 (0)
5	Conductivity	µS/cm at 20 °C	1000		1000		1000	
6	Odour (dilution factor at 25 °C)		3		10		20	
7*	Nitrates	mg/1 NO3	25	50 (O)		50 (O)		50 (O)
8 (1)	Fluorides	mg/1 F	0.7 to 1	1.5	0.7 to 1.7		0.7 to 1.7	
9	Total extractable organic chlorine	mg/1 Cl						
10*	Dissolved iron	mg/1 Fe	0.1	0.3	1	2	1	
11*	Manganese	mg/1 Mn	0.05		0.1		1	
12	Copper	mg/I Cu	0.02	0.05 (O)	0.05		1	
13	Zinc	mg/1 Zn	0.5	3	1	5	1	5
14	Boron	mg/1 B	1		1		1	
15	Beryllium	mg/1 Be						
16	Cobalt	mg/1 Co						
17	Nickel	mg/1 Ni						
18	Vanadium	mg/1 V						
19	Arsenic	mg/1 As	0.01	0.05		0.05	0.05	0.1
20	Cadmium	mg/1 Cd	0.001	0.005	0.001	0.005	0.001	0.005
21	Total chromium	mg/1 Cr		0.05		0.05		0.05
22	Lead	mg/1 Pb		0.05		0.05		0.05
23	Selenium	mg/1 Se		0.01		0.01		0.01
24	Mercury	mg/1 Hg	0.0005	0.001	0.0005	0.001	0.0005	0.001
25	Barium	mg/1 Ba		0.1		1		1
26	Cyanide	mg/1 Cn		0.05		0.05		0.05
27	Sulphates	mg/1 SO4	150	250	150	250 (O)	150	250 (O)
28	Chlorides	mg/1 Cl	200		200		200	
29	Surfactants (reacting with methyl blue) (laurylsulphate)	mg/1	0.2		0.2		0.5	
30 * (2)	Phosphates	mg/1 P_2O_5	0.4		0.7		0.7	

	Parameters	Al G	Al I	A2 G	A2 I	A3 G	A3 I
31	Phenols (phenol index) paranitraniline 4-aminoantipyrine mg/1 C-$_6H_5OH$		0.001	0.001	0.005	0.01	0.1
32	Dissolved or emulsified hydrocarbons (after extraction by petroleum ether) mg/1		0.05		0.2	0.5	1
33	Polycyclic aromatic hydrocarbons mg/1		0.0002		0.0002		0.001
34	Total pesticides (parathion, BHC, dieldrin) mg/1		0.001		0.0025		0.005
35*	Chemical oxygen demand (COD) mg/1 O_2					30	
36*	Dissolved oxygen saturation rate % O_2	>70		>50		>30	
37*	Biochemical oxygen demand (BOD_5) (at 20 'C without nitrification) mg/1 O_2	< 3		< 5		< 7	
38	Nitrogen by Kjeldahl method (except N03) mg/1 N	1		2		3	
39	Ammonia mg/1 NH_4	005		1	15	2	4(0)
40	Substances extractable with chloroform mg/1 SEC	0.1		0.2		0.5	
41	Total organic carbon mg/1 C						
42	Residual organic carbon after flocculation and membrane filtration (5mu) TOC mg/l C						
43	Total coliforms 37 'C /100 ml	50		5000		50000	
44	Faecal coliforms /100 ml	20		2000		20000	
45	Faecal streptococci /100 ml	20		1000		10000	
46	Salmonella	Not pre-sent in 5000ml		Not pre-sent in 1000 ml			

I = mandatory.

G = guide.

O = exceptional climatic or geographical conditions.

* = see Article 8 (d).

(1) The values given are upper limits set in relation to the mean annual temperature (high and low).

(2) This parameter has been included to satisfy the ecological requirements of certain types of environment.

DIRECTIVE 76/160/EEC ON THE QUALITY OF BATHING WATERS

ANNEX: Quality Requirements for Bathing Water

	Parameters	G	I	Minimum sampling frequency	Methods of analysis and inspection
	Microbiological:				
1	Total coliforms [/100 ml]	50	10000	Fortnightly (1)	Fermentation in multiple tubes. Subculturing of the positive tubes on a confirmation medium. Count according to MPN (most probable number) or membrane filtration and culture on an appropriate medium such as Tergitol lactose agar, endo agar, 0,4 % Teepol broth, subculturing and identification of the suspect colonies. In the case of 1 and 2, the incubation temperature is variable according to whether total or faecal coliforms are being investigated.
2	Faecal coliforms [/100 ml]	100	2000	Fortnightly (1)	
3	Faceal streptococci [/100ml]	100	-	(2)	Litsky method. Count according to MPN (most probable number) or filtration on membrane. Culture on an appropriate medium. Fermentation in multiple tubes. Subculturing of the positive tubes on a confirmation medium. Count according to MPN (most probable number) or membrane filtration and culture on an appropriate medium such as Tergitol lactose agar, endo agar, 0,4 % Teepol broth, subculturing and identification of the suspect colonies.
4	Salmonella [/1 l]	-	0	(2)	Concentration by membrane filtration. Inoculation on a standard medium. Enrichment — subculturing on isolating agar — identification.
5	Enteroviruses [PFU /10 l]	-	0	(2)	Concentrating by filtration, flocculation or centrifuging and confirmation.
	Physico-chemical:				
6	pH	-	6 to 9 (O)	(2)	Electrometry with calibration at pH 7 and 9
7	Colour	-	No abornal change in colour (O)	Fortnightly (1)	Visual inspection or photometry with standards on the Pt.Co scale.
			-	(2)	
8	Mineral oils	-	No film visible on the surface of the water and no colour	Fortnightly (1)	Visual and olfactory inspection or extraction using an adequate volume and weighing the dry residue.
	[mg/litre]	≤ 0.3	-	(2)	
9	Surface-active substances reacting with methylene blue	-	No lasting foam	Fortnightly (1)	Visual inspection or absorption spectrophotometry with methylene blue.
	[mg/l (lauryl-sulfate)]	≤ 0.3	-	(2)	
10	Phenols (phenol indices)	-	No specific odour	Fortnightly (1)	Verification of the absence of specific odour due to phenol or absorption

	Parameters	G	I	Minimum sampling frequency	Methods of analysis and inspection
					spectrophotometry 4-aminoantipyrine (4 AAP) method.
	[mg/l C_5H_5OH]	≤ 0.005	-	(2)	
11	Transparency [m]	2	1 (O)	Fortnightly (1)	Secchi's disk
12	Dissolved oxygen [% saturation]	80 – 120	-	(2)	Winkler'smethod or electrometric method (oxygen meter).
13	Tarry residues and floating materials such as wood, plastic articles, bottles, containers of glass, plastic, rubber or any other substance. Waste or splinters.	Absence		Fortnightly (1)	Visual inspection
14	Ammonia [mg/litre NH_4)			(3)	Absorption spectrophotometry, Nessler's method, or indophenol blue method.
15	Nitrogen Kjeldahl [mg/litre N]			(3)	Kjeldahl method
	Other substances regarded as indications of pollution				
16	Pesticides (parathlon, HCH, diedrin) [mg/l]			(2)	Extraction with appropriate solvents and chromatographic determination
17	Heavy metals such as: — arsenic [mg/l As] — cadmium [mg/l Cd] — chrome VI [mg/l Cr VI] — lead [mg/l Pb] — mercury [mg/l Hg]			(2)	Atomic absorption possibly preceded by extraction
18	Cyanides [mg/litre Cn]			(2)	Absorption spectrophotometry using a specific reagent
19	Nitrates [mg/litre] NO_3] and Phosphates [mg/litre PO_4]			(2)	Absorption spectrophotometry using a specific reagent

G = guide
I = mandatory

(0) Provision exists for exceeding the limits in the event of exceptional geographical or meteorological conditions.

(1) When a sampling taken in previous years produced results which are appreciably better than those in this Annex and when no new factor likely to lower the quality of the water has appeared, the competent authorities may reduce the sampling frequency by factor of 2.

(2) Concentration to be checked by the competent authorities when an inspection in the bathing area shows that the substance may be present or that the quality of the water has deteriorated.

(3) These parameters must be checked by the competent authorities when there is a tendency towards the eutrophication of the water.

DIRECTIVE 2006/7/EEC CONCERNING THE MANAGEMENT OF BATHING WATER QUALITY AND REPEALING DIRECTIVE 76/160/EEC

ANNEX I

For inland waters

	A	B	C	D	E
	Parameter	Excellent quality	Good quality	Sufficient	Reference methods of analysis
1	Intestinal enterococci (cfu/100 ml)	200 (*)	400 (*)	330 (**)	ISO 7899-1 or ISO 7899-2
2	Escherichia coli (cfu/100 ml)	500 (*)	1000 (*)	900 (**)	ISO 9308-3 or ISO 9308-1

(*) Based upon a 95-percentile evaluation. See Annex II.

(**) Based upon a 90-percentile evaluation. See Annex II.

For coastal and transitional waters

	A	B	C	D	E
	Parameter	Excellent quality	Good quality	Sufficient	Reference methods of analysis
1	Intestinal enterococci (cfu/100 ml)	100 (*)	200 (*)	185 (**)	ISO 7899-1 or ISO 7899-2
2	Escherichia coli (cfu/100 ml)	250 (*)	500 (*)	500 (**)	ISO 9308-3 or ISO 9308-1

(*) Based upon a 95-percentile evaluation. See Annex II.

(**) Based upon a 90-percentile evaluation. See Annex II.

ANNEX II Bathing water assessment and classification

1. Poor quality

Bathing waters are to be classified as 'poor' if, in the set of bathing water quality data for the last assessment period ([a]), the percentile values ([b]) for microbiological enumerations are worse ([c]) than the 'sufficient' values set out in Annex I, column D.

2. Sufficient quality

Bathing waters are to be classified as 'sufficient':

1. if, in the set of bathing water quality data for the last assessment period, the percentile values for microbiological enumerations are equal to or better (d) than the 'sufficient' values set out in Annex I, column D; and

2. if the bathing water is subject to short-term pollution, on condition that:

i. adequate management measures are being taken, including surveillance, early warning systems and monitoring, with a view to preventing bathers' exposure by means of a warning or, where necessary, a bathing prohibition;

ii. adequate management measures are being taken to prevent, reduce or eliminate the causes of pollution; and

iii. the number of samples disregarded in accordance with Article 3(6) because of short□term pollution during the last assessment period represented no more than 15 % of the total number of samples provided for in the monitoring calendars established for that period, or no more than one sample per bathing season, whichever is the greater.

3. Good quality

Bathing waters are to be classified as ‘good’:

1. if, in the set of bathing water quality data for the last assessment period, the percentile values for microbiological enumerations are equal to or better (d) than the ‘good quality’ values set out in Annex I, column C; and

2. if the bathing water is subject to short-term pollution, on condition that:

i. (adequate management measures are being taken, including surveillance, early warning systems and monitoring, with a view to preventing bathers' exposure, by means of a warning or, where necessary, a bathing prohibition;

ii. adequate management measures are being taken to prevent, reduce or eliminate the causes of pollution; and

iii. the number of samples disregarded in accordance with Article 3(6) because of short□term pollution during the last assessment period represented no more than 15 % of the total number of samples provided for in the monitoring calendars established for that period, or no more than one sample per bathing season, whichever is the greater.

4. Excellent quality

Bathing waters are to be classified as ‘excellent’:

1. if, in the set of bathing water quality data for the last assessment period, the percentile values for microbiological enumerations are equal to or better than the ‘excellent quality’ values set out in Annex I, column B; and

2. if the bathing water is subject to short-term pollution, on condition that:

i. adequate management measures are being taken, including surveillance, early warning systems and monitoring, with a view to preventing bathers' exposure, by means of a warning or, where necessary, a bathing prohibition;

ii. adequate management measures are being taken to prevent, reduce or eliminate the causes of pollution; and

iii. the number of samples disregarded in accordance with Article 3(6) because of short-term pollution during the last assessment period represented no more than 15 % of the total number of samples provided for in the monitoring calendars established for that period, or no more than one sample per bathing season, whichever is the greater.

Notes

(a) 'Last assessment period' means the last four bathing seasons or, when applicable, the period specified in Article 4(2) or (4).

(b) Based upon percentile evaluation of the log10 normal probability density function of microbiological data acquired from the particular bathing water, the percentile value is derived as follows:

(i) Take the log10 value of all bacterial enumerations in the data sequence to be evaluated. (If a zero value is obtained, take the log10 value of the minimum detection limit of the analytical method used instead.)

(ii) Calculate the arithmetic mean of the log10 values (μ).

(iii) Calculate the standard deviation of the log10 values (σ).

The upper 90-percentile point of the data probability density function is derived from the following equation:

upper 90-percentile = antilog (μ + 1,282 σ).

The upper 95-percentile point of the data probability density function is derived from the following equation:

upper 95-percentile = antilog (μ + 1,65 σ).

(c) 'Worse' means with higher concentration values expressed in cfu/100 ml.

(d) 'Better' means with lower concentration values expressed in cfu/100 ml.

DIRECTIVE 76/464/EEC ON POLLUTION CAUSED BY CERTAIN DANGEROUS SUBSTANCES DISCHARGED INTO THE AQUATIC ENVIRONMENT OF THE COMMUNITY

List I of families and groups of substances

List I contains certain individual substances which belong to the following families and groups of substances, selected mainly on the basis of their toxicity, persistence and bioaccumulation, with the exception of those which are biologically harmless or which are rapidly converted into substances which are biologically harmless:

1. organohalogen compounds and substances which may form such compounds in the aquatic environment,
2. organophosphorus compounds,
3. organotin compounds,
4. substances for which it has been proved that they possess carcinogenic properties in or via the aquatic environment (where certain substances in List II are carcinogenic, they are included in category 4 of this list),
5. mercury and its compounds,
6. cadmium and its compounds,
7. persistent mineral oils and hydrocarbons of petroleum origin,
8. persistent synthetic substances which may float, remain in suspension or sink and which may interfere with any use of the waters.

List II of families and groups of substances

List II contains:

1. substances belonging to the families and groups of substances in List I for which the limit values referred to in Article 6 of the Directive have not been determined,
2. certain individual substances and categories of substances belonging to the families and groups of substances listed below,

and which have a deleterious effect on the aquatic environment, which can, however, be confined to a given area and which depend on the characteristics and location of the water into which they are discharged.

Families and groups of substances referred to in the second indent

a The following metalloids and metals and their compounds:

1. zinc
2. copper
3. nickel
4. chromium
5. lead
6. selenium
7. arsenic
8. antimony
9. molybdenum
10. titanium
11. tin
12. barium
13. beryllium
14. boron
15. uranium
16. vanadium
17. cobalt
18. thalium
19. tellurium
20. silver

b Biocides and their derivatives not appearing in List I.

c Substances which have a deleterious effect on the taste and/or smell of the products for human consumption derived from the aquatic environment, and compounds liable to give rise to such substances in water.

d Toxic or persistent organic compounds of silicon, and substances which may give rise to such compounds in water, excluding those which are biologically harmless or are rapidly converted in water into harmless substances.

e Inorganic compounds of phosphorus and elemental phosphorus.

f Non persistent mineral oils and hydrocarbons of petroleum origin.

g Cyanides, fluorides.

h Substances which have an adverse effect on the oxygen balance, particularly: ammonia, nitrites.

Statement on Article 8

With regard to the discharge of waste water into the open sea by means of pipelines, Member States undertake to lay down requirements which shall be not less stringent than those imposed by this Directive.

DIRECTIVE 78/659/EEC ON THE QUALITY OF FRESH WATERS NEEDING PROTECTION OR IMPROVEMENT IN ORDER TO PROTECT FISH LIFE

ANNEX I List of Parameters

Parameter	Salmonid waters		Cyprinids waters		Methods of analysis or inspection	Minimum sampling and measuring frequency	Observations
	G	**I**	**G**	**I**			
1. Temperature (°C)	1. Temperature measured downstream of a point of thermal discharge (at the edge of the mixing zone) must not exceed the unaffected temperature by more than:				Thermometry	Weekly, both upstream and downstream of the point of thermal discharge	Over-sudden variations in temperature shall be avoided
		1.5°C		3°C			
	Derogations limited in geographical scope may be decided by Member States in particular conditions if the competent authority can prove that there are no harmful consequences for the balanced development of the fish population 2. Thermal discharges must not cause the temperature downstream of the point of thermal discharge (at the edge of the mixing zone) to exceed the following:						
		21.5 (0)		10(0)			
		28 (0)		10(0)			
	The 10°C temperature limit applies only to breeding periods of species which need cold water for reproduction and only to waters which may contain such species Temperature limits may, however, be exceeded for 2 % of the time.						
2. Dissolved oxygen (mg/1 O_2	50 % ≥ 9 100 % ≥ 7	50 % ≥ 9 When the oxygen concentration falls below 6 mg/1, Member States shall implement	50 % ≥ 8 100 % ≥ 7	50 % ≥ 7 When the oxygen concentration falls below 4 mg/1, Member States shall implement	Winkler's method or specific electrodes (electro-chemical method)	Monthly, minimum one sample representative of low oxygen con-ditions of the day of sampling. However, where major daily variations are suspected, a minimum of two day samples in	

Parameter	Salmonid waters		Cyprinids waters		Methods of analysis or inspection	Minimum sampling and measuring frequency	Observations
	G	I	G	I			
		the provisions of Article 7 (3). The competent authority must prove that this situation will have no harmful consequences for the balanced development of the fish population		the provisions of Article 7 (3). The competent authority must prove that this situation will have no harmful consequences for the balanced development of the fish population		one day shall be taken	
3. pH		6-9 (^{0}) (^{1})		6-9 (^{0}) (^{1})	Electrometry calibration by means of two solutions with known pH values, preferably on either side of, and close to the pH being measured	Monthly	
4. Suspended solids (mg/1)	≤ 25 (0)		≤ 25 (0)		Filtration through a 0.45 micron filtering membrane, or centrifugation (five minutes minimum, average acceleration of 2 800 to 3200 g) drying at 105°C and weighing		The values shown are average concentrations and do not apply to suspended solids with harmful chemical properties. Floods are liable to cause particularly high concentrations
5. BOD, (mg/1) 0_2	≤ 3		≤ 6		Determination of O2 by the Winkler method before and after five days incubation in complete darkness at 20 ± 1°C. (nitrification should not be inhibited)		
6. Total phosphorus (mg/1 P)					Molecular absorption spectro-photometry		In the case of lakes of average depth between 18 and 300 m, the following formula could be applied:

Parameter	Salmonid waters		Cyprinids waters		Methods of analysis or inspection	Minimum sampling and measuring frequency	Observations
	G	I	G	I			
							$L \leq 10 \frac{Z}{(1+\sqrt{T_w})}$ T_w where:
							L = loading expressed as mg P per square metre lake surface in one year *i* = mean depth of lake in meters T_w = theoretical renewal time of lake water in years. In other cases limit values of 0.2 mg/l for salmonid and of 0.4 mg/l for cyprinid waters, expressed as PO_4, may be regarded as indicative in order to reduce eutrophication
7. Nitrites (mg/1 $N0_2$)	≤ 0.01		≤ 0.03		Molecular absorption spectro-photometry		
8. Phenolic compounds (mg/ 1 C_6H_5OH)		([2])		([2])	By taste		An examination by taste shall be made only where the presence of phenolic compounds is presumed
9. Petroleum hydrocarbons		([3])		([3])	Visual By taste	Monthly	A visual examination shall be made regularly once a month, with an examination by taste only where the presence of hydrocarbon

Parameter	Salmonid waters		Cyprinids waters		Methods of analysis or inspection	Minimum sampling and measuring frequency	Observations
	G	I	G	I			
							is presumed
10. Non-ionized ammonia (mg/1 NH,	≤ 0.005	≤ 0.025	≤ 0.005	≤ 0.025	Molecular absorption spectro-photometry using indophenol blue or Nessler's method asso-ciated with pH and temperature determination	Monthly	Values for non-ionized ammonia may be exceeded in the form of minor peaks in the daytime
	In order to diminish the risk of toxicity due to non-ionized ammonia, of oxygen consumption due to nitrification and of eutrophication, the concentrations of total ammonium should not exceed the following:						
11. Total Ammonium (mg/1 NH_4)	≤ 0.04	≤ l ([4])	≤ 0.2	≤ l ([4])			
12. Total residual chlorine (mg/1 HOC1)		≤ 0.005		≤ 0.005	DPD-method (dietyl-p-phenyle-nediamene)	Monthly	The I-values correspond to pH = 6 Higher concentrations of total chlorine can be accepted if the pH is higher
13. Total zinc (mg/ 1 Zn)		≤ 0.3		≤ 1.0	Atomic absorption spectrometry	Monthly	The I-values correspond to a water hardness of 100 mg/1 $CaCO_3$. For hardness levels between 10 and 500 mg/1 corresponding limit values can be found in Annex II
14. Dissolved copper (mg/1 CU)	< 0.4		< 0.04		Atomic absorption spectrometry		The G-values correspond to a water hardness of 100 mg/1 $CaCO_3$. For hardness levels between 10 and 300 mg/1 corresponding limit values can be found in Annex II

G = guide.
I = mandatory.
(0) = derogations are possible in accordance with Article II.

([1]) Artificial pH variations with respect to the unaffected values shall not exceed ± 0.5 pH unit within the limits falling between 6.0 and 9.0 provided that these variations do not increase the harmfulness of other substances present in the water.

([2]) Phenolic compounds must not be present in such concentrations that they adversely affect fish flavour.

([3]) Petroleum products must not be present in water in such quantities that they:

- form a visible film on the surface of the water or form coatings on the beds of water-courses and lakes,
- impart a detectable 'hydrocarbon' taste to fish,
- produce harmful effects in fish.

([4]) In particular geographical or climatic conditions and particularly in cases of law water temperature and of reduced nitrification or where the competent authority can prove that there are no harmful consequences for the balanced development of the fish population; Member states may fix values higher than 1 mg/l.

ANNEX II Particulars Regarding Total Zinc and Dissolved Copper

Total zinc

(see Annex I, No 13, 'Observations' column)

Zinc concentrations for different water hardness values between 10 and 500 mg/l $CaCO_3$:

	Water hardness (mg/l $CaCO_3$)			
	10	*50*	*100*	*500*
Salmonid waters ([µg/l Zn)	30	200	300	500
Cyprinid waters ([µg/l Zn)	300	700	1000	2000

Dissolved copper

(see Annex I, No 14, 'Observations' column)

Dissolved copper concentrations for different water hardness values between 10 and 3500 mg/l CaCO3:

	Water hardness (mg/l $CaCO_3$)			
	10	*50*	*100*	*300*
[µg/l Cu	5*	22	40	112

* the presence of fish in waters containing higher concentrations of copper may indicate a predominance of dissolved organo-cupric complexes.

PROPOSAL FOR
A DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL ON ENVIRONMENTAL QUALITY STANDARDS IN THE FIELD OF WATER POLICY AND AMENDING DIRECTIVE 2000/60/EC

ANNEX I: Environmental Quality Standards for Priority Substances and Certain Other Pollutants

PART A: Environmental Quality Standards (EQS) for Priority Substances in surface water

AA: annual average;
MAC: maximum allowable concentration.
Unit: [µg/l].

	Name of substance	CAS number	AA-EQS[1] Inland surface waters	AA-EQS Other surface waters	MAC-EQS[2] Inland surface waters	MAC-EQS Other surface waters
(1)	Alachlor	15972-60-8	0.3	0.3	0.7	0.7
(2)	Anthracene	120-12-7	0.1	0.1	0.4	0.4
(3)	Atrazine	1912-24-9	0.6	0.6	2.0	2.0
(4)	Benzene	71-43-2	10	8	50	50
(5)	Pentabromodiphenylether[3]	32534-81-9	0.0005	0.0002	*not applicable*	*not applicable*
(6)	Cadmium and its compounds (*depending on water hardness classes*[4])	7440-43-9	≤0.08 (Class 1) 0.08 (Class 2) 0.09 (Class 3) 0.15 (Class 4) 0.25 (Class 5)	0.2	≤ 0.45 (Class 1) 0.45 (Class 2) 0.6 (Class 3) 0.9 (Class 4) 1.5 (Class 5)	
(7)	C10-13-chloroalkanes	85535-84-8	0.4	0.4	1.4	1.4
(8)	Chlorfenvinphos	470-90-6	0.1	0.1	0.3	0.3
(9)	Chlorpyrifos	2921-88-2	0.03	0.03	0.1	0.1
(10)	1,2-Dichloroethane	107-06-2	10	10	*not applicable*	*not applicable*
(11)	Dichloromethane	75-09-2	20	20	*not applicable*	*not applicable*
(12)	Di(2-ethylhexyl)phthalate (DEHP)	117-81-7	1.3	1.3	*not applicable*	*not applicable*
(13)	Diuron	330-54-1	0.2	0.2	1.8	1.8
(14)	Endosulfan	115-29-7	0.005	0.0005	0.01	0.004

[1] This parameter is the Environmental Quality Standard expressed as an annual average value (EQS-AA).

[2] This parameter is the Environmental Quality Standard expressed as a maximum allowable concentration (EQS-MAC). Where the MAC-EQS are marked as "not applicable", the AA-EQS values are also protective against short-term pollution peaks since they are significantly lower than the values derived on the basis of acute toxicity.

[3] For the group of priority substances covered by brominated diphenylethers (No. 5) listed in Decision 2455/2001/EC, an EQS is established only for pentabromodiphenylether.

[4] For Cadmium and its compounds (No. 6) the EQS values vary dependent upon the hardness of the water as specified in five class categories (Class 1: <40 mg CaCO3/l, Class 2: 40 to <50 mg CaCO3/l, Class 3: 50 to <100 mg CaCO3/l, Class 4: 100 to <200 mg CaCO3/l and Class 5: ≥200 mg CaCO3/l).

(15)	Fluoranthene	206-44-0	0.1	0.1	1	1
(16)	Hexachlorobenzene	118-74-1	0.01	0.01	0.05	0.05
(17)	Hexachlorobutadiene	87-68-3	0.1	0.1	0.6	0.6
(18)	Hexachlorocyclohexane	608-73-1	0.02	0.002	0.04	0.02
(19)	Isoproturon	34123-59-6	0.3	0.3	1.0	1.0
(20)	Lead and its compounds	7439-92-1	7.2	7.2	*not applicable*	*not applicable*
(21)	Mercury and its compounds	7439-97-6	0.05	0.05	0.07	0.07
(22)	Naphthalene	91-20-3	2.4	1.2	*not applicable*	*not applicable*
(23)	Nickel and its compounds	7440-02-0	20	20	*not applicable*	*not applicable*
(24)	Nonylphenol	25154-52-3	0.3	0.3	2.0	2.0
(25)	Octylphenol	1806-26-4	0.1	0.01	*not applicable*	*not applicable*
(26)	Pentachlorobenzene	608-93-5	0.007	0.0007	*not applicable*	*not applicable*
(27)	Pentachlorophenol	87-86-5	0.4	0.4	1	1
(28)	Polyaromatic hydrocarbons[5]	*not applicable*	*not applicable*	*not applicable*	*not applicable*	*not applicable*
	(Benzo(a)pyrene),	50-32-8	0.05	0.05	0.1	0.1
	(Benzo(b)fluoranthene),	205-99-2	∑= 0.03	∑= 0.03	*not applicable*	*not applicable*
	(Benzo(g,h,i)perylene),	191-24-2				
	(Benzo(k)fluoranthene),	207-08-9	∑= 0.002	∑= 0.002	*not applicable*	*not applicable*
	(Indeno(1,2,3-cd)pyrene)	193-39-5				
(29)	Simazine	122-34-9	1	1	4	4
(30)	Tributyltin compounds	688-73-3	0.0002	0.0002	0.0015	0.0015
(31)	Trichlorobenzenes (all isomers)	12002-48-1	0.4	0.4	*not applicable*	*not applicable*
(32)	Trichloromethane (Chloroform)	67-66-3	2.5	2.5	*not applicable*	*not applicable*
(33)	Trifluralin	1582-09-8	0.03	0.03	*not applicable*	*not applicable*

[5] For the group of priority substances of polyaromatic hydrocarbons (PAH) (No. 28), each individual EQS shall be complied with, i.e., the EQS for Benzo(a)pyrene and the EQS for the sum of Benzo(b)fluoranthene and Benzo(k)fluoranthene and the EQS for the sum of Benzo(g,h,i)perylene and Indeno(1,2,3-cd)pyrene must be met.

PART B: Environmental Quality Standards (EQS) for other Pollutants

AA: annual average;
MAC: maximum allowable concentration.
Unit: [μg/l].

	Name of substance	CAS number	AA-EQS[21] Inland surface waters	AA-EQS[21] Other surface waters	MAC-EQS[22] Inland surface waters	MAC-EQS[22] Other surface waters
(1)	DDT total[6]	*not applicable*	0.025	0.025	*not applicable*	*not applicable*
	para-para-DDT	50-29-3	0.01	0.01		
(2)	Aldrin	309-00-2	∑= 0.010	∑= 0.005	*not applicable*	*not applicable*
(3)	Dieldrin	60-57-1				
(4)	Endrin	72-20-8				
(5)	Isodrin	465-73-6				
(6)	Carbontetrachloride	56-23-5	12	12	*not applicable*	*not applicable*
(7)	Tetrachloroethylene	127-18-4	10	10	*not applicable*	*not applicable*
(8)	Trichloroethylene	79-01-6	10	10	*not applicable*	*not applicable*

PART C: Compliance with Environmental Quality Standards

1. Column 4 and 5: For any given surface water body, compliance with EQS-AA requires that for each representative monitoring point within the water body, the arithmetic mean of the concentrations measured at different times during the year is below the standard.

2. Column 6 and 7: For any given surface water body compliance with EQS-MAC means that the measured concentration at any representative monitoring point within the water body must not exceed the standard.

3. With the exception of cadmium, lead, mercury and nickel (hereinafter "metals") the Environmental Quality Standards (EQS) set up in this Annex are expressed as total concentrations in the whole water sample. In the case of metals the EQS refers to the dissolved concentration, i.e. the dissolved phase of a water sample obtained by filtration through a 0.45 μm filter or any equivalent pre-treatment.

If natural background concentrations for metals are higher than the EQS value or if hardness, pH or other water quality parameters affect the bioavailability of metals, Member States may take this into account when assessing the monitoring results against the EQS. If they choose to do so, the use of calculation methods set up pursuant to Article 2(5) is compulsory.

[6] DDT total comprises the sum of the isomers 1,1,1-trichloro-2,2 bis (p-chlorophenyl) ethane (CAS number 50-29-3); 1,1,1-trichloro-2 (o-chlorophenyl)-2-(p-chlorophenyl) ethane (CAS number 789-02-6); 1,1-dichloro-2,2 bis (p-chlorophenyl) ethylene (CAS number 72-55-9); and 1,1-dichloro-2,2 bis (pchlorophenyl) ethane (CAS number 72-54-8).

ANNEX 3

QUALITY STANDARDS AND CLASSIFICATION SCHEMES OF ROMANIA, ICPDR AND ECE

Old Romanian water quality classification scheme (STAS 4706/1988)

	Class		
General parameters	**1**	**2**	**3**
pH	6.5-8.5	6.5-8.5	6.5-8.5
Ammonium ion (NH_4^+) (mg/l)	1	3	10
Free ammonia (NH_3) (mg/l)	0.1	0.3	0.6
Nitrate (NO_3^-) (mg/l)	10	30	No standard
Nitrite (NO_2^-) (mg/l)	1	3	No standard
Calcium (mg/l)	150	200	300
Residual free chlorine (mg/l)	0.005	0.005	0.005
Chloride (mg/l)	250	300	300
Free carbon dioxide (mg/l)	50	50	50
Phenols (mg/l)	0.001	0.02	0.05
Iron total (mg/l)	0.3	1	1
Phosphorus (mg/l)	0.1	0.1	0.1
Hydrogen sulphide (mg/l)	absent	absent	0.1
Magnesium (mg/l)	50	100	200
Manganese (mg/l)	0.1	0.3	0.8
Dissolved oxygen (mg/l)	6	5	4
Hydrocarbons (mg/l)	0.1	0.1	0.1
Filterable residue (mg/l)	750	1000	1200
Sodium (mg/l)	100	200	200
BOD_5 (mg/l)	5	7	12
COD (MnO_4^-) (mg/l)	10	15	25
COD ($Cr_2O_7^{2-}$) (mg/l)	20	20	30
Sulphate (mg/l)	200	400	400
Coliform bacteria (cfu/l)	100000	-	-

Dangerous substances (mg/l)	**All classes**	**Dangerous substances (mg/l)**	**All classes**
Silver	0.01	Molybdenum	0.05
Arsenic	0.01	Nickel	0.1
Barium	1	Pesticides	
Cadmium	0.003	- triazine	0.001
Cyanide	0.01	- triazinone	0.001
Cobalt	1	- toluidine	0.001
Chromium (Cr^{III})	0.5	- 0rganochlorines	0.001
Chromium (Cr^{VI})	0.05	- 0rganophosphorus	absent
Copper	0.05	- Organometallic	absent
Anionic detergents	0.5	- Nitro derivatives	absent
Fluoride	0.5	Lead	0.05
PAH	0.0002	Selenium	0.01
Mercury	0.001	Zinc	0.03

Quality elements and physico-chemical quality standards for assessment of ecological status of surface water in Romania, 2006 (GD 161)

Nr.	Quality indicator / parameter	unit	Quality class				
			I	II	III	IV	V
C.1. **Thermal and acidification regime**							
1	Temperature	ºC	not regulated				
2	pH		6.5 – 8.5				
C.2. **Oxygen regime**							
1	Dissolved oxygen (DO)	mg O_2/l	9	7	5	4	<4
2	Dissolved oxygen saturation	%					
	-epilimnion (stratified waters)		90-110	70-90	50-70	30-50	<30
	-hypoilimnion (stratified waters)		90-70	70-50	50-30	30-10	<10
	-unstratisfied waters		90-70	70-50	50-30	30-10	<10
3	BOD_5	mg O_2/l	3	5	7	20	>20
4	COD – Mn	mg O_2/l	5	10	20	50	>50
5	COD-Cr	mg O_2/l	10	25	50	125	>125
C.3. **Nutrients**							
1	Ammonia ($N\text{-}NH_4^+$)	mg N/l	0.4	0.8	1,2	3.2	>3.2
2	Nitrites ($N\text{-}NO_2^-$)	mg N/l	0.01	0.03	0.06	0.3	>0.3
3	Nitrates ($N\text{-}NO_3^-$)	mg N/l	1	3	5,6	11,2	>11,2
4	Total Nitrogen (TN)	mg N/l	1.5	7	12	16	>16
5	Orthophosphates ($P\text{-}PO_4^{3-}$)	mg P/l	0.1	0.2	0.4	0.19	>0.19
6	Total phosphorous (P)	mg P/l	0.15	0.4	0.75	1.2	>1.2
9	Chlorophyll “a”	µg/l	25	50	100	250	>250
C.4. **Salinity**							
1	Conductivity	µS/cm					
2	Total residue at 105 ºC	mg/l	500	750	1000	1300	>1300
3	Chorides (Cl^-)	mg/l	25	50	250	300	>300
4	Suphates (SO_4^{2+})	mg/l	60	120	250	300	>300
5	Calcium (Ca^{2+})	mg/l	50	100	200	300	>300
6	Magnezium (Mg^{2+})	mg/l	12	50	100	200	>200
7	Natrium (Na^+)	mg/l	25	50	100	200	>200
C.5**. Specific toxic polutants of natural origin – total value**							
1	Chromium total (Cr^{3+} + Cr^{6+})	µg/l	25	50	100	250	>250
2	Copper (Cu^{2+})[5]	µg/l	20	30	50	100	>100
3	Zinc (Zn^{2+})	µg/l	100	200	500	1000	>1000
4	Arsenium (As^{3+})	µg/l	10	20	50	100	>100
10	Barium (Ba^{2+})	mg/l	0.05	0.1	0.5	1	>1
5	Selenium (Se^{4+})	µg/l	1	2	5	10	>10
6	Cobalt (Co^{3+})	µg/l	10	20	50	100	>100
7	Lead (Pb)[6]	µg/l	5	10	25	50	>50
8	Cadmium (Cd)	µg/l	0.5	1	2	5	>5
8	Total iron (Fe^{2+} + Fe^{3+})	mg/l	0.3	0.5	1.0	2	>2
9	Mercury (Hg)[6]	µg/l	0.1	0.3	0.5	1	>1
9	Manganese total (Mn^{2+} + Mn^{7+})	mg/l	0.05	0.1	0.3	1	>1
10	Nickel (Ni)[5]	µg/l	10	25	50	100	>100
C.6**. Other relevant chemical elements**							
1	Total phenols (phenols index)	µg/l	1	5	20	50	>50
2	Non-ionic detergents	µg/l	100	200	300	500	>500
3	AOX	µg/l	10	50	100	250	>250

ICPDR Water quality classification scheme used for TNMN purposes

Determinand	Unit	*Class*				
		I	**II TV**	**III**	**IV**	**V**
Oxygen regime						
Dissolved oxygen*	mg/l O_2	7	6	5	4	>4
BOD_5	mg/l O_2	3	5	10	25	>25
COD-Mn	mg/l O_2	5	10	20	50	>50
COD-Cr	mg/l O_2	10	25	50	125	>125
Nutrient regime						
Ammonium-N	mg N/l	0.2	0.3	0.6	1.5	>1.5
Nitrite-N	mg N/l	0.01	0.06	0.12	0.3	>0.3
Nitrate-N	mg N/l	1	3	6	15	>15
Total-N	mg N/l	1.5	4	8	20	>20
Ortho-phosphate-P	mg P/l	0.05	0.1	0.2	0.5	>0.5
Total-P	mg P/l	0.1	0.2	0.4	1	>1
Chlorophyll "a"	µg/l	25	50	100	250	>250
Metals (dissolved)**						
Zinc	µg/l	-	5	-	-	-
Copper	µg/l	-	2	-	-	-
Total Chromium (Cr-III + VI)	µg/l	-	2	-	-	-
Lead	µg/l	-	1	-	-	-
Cadmium	µg/l	-	0.1	-	-	-
Mercury	µg/l	-	0.1	-	-	-
Nickel	µg/l	-	1.0	-	-	-
Arsenic	µg/l	-	1.0	-	-	-
Metals (total)						
Zinc	µg/l	bg	100	200	500	>500
Copper	µg/l	bg	20	40	100	>100
Total Chromium (Cr-III + VI)	µg/l	bg	50	100	250	>250
Lead	µg/l	bg	5	10	25	>25
Cadmium	µg/l	bg	1	2	5	>5
Mercury	µg/l	bg	0.1	0.2	0.5	>0.5
Nickel	µg/l	bg	50	100	250	>250
Arsenic	µg/l	bg	5	10	25	>25
Toxic substances						
AOX	µg/l	10	50	100	250	>250
Lindane	µg/l	0.05	0.1	0.2	0.5	>0.5
pp' DDT	µg/l	0.001	0.01	0.02	0.05	>0.05
Atrazine	µg/l	0.02	0.1	0.2	0.5	>0.5
Trichlormethane	µg/l	0.02	0.6	1.2	1.8	>1.8
Tetrachlormethane	µg/l	0.02	1	2	5	>5
Trichlorethane	µg/l	0.02	1	2	5	>5
Tetrachlorethane	µg/l	0.02	1	2	5	>5
Biology						
Saprobic index of macrozoobenthos		≤1.8	1.8 – 2.3	2.31 – 2.7	2.71 – 3.2	>3.2

* values concern 10-percentile value
** for dissolved metals only guideline values are indicated
bg background values
TV target value

ECE (Economic Commission for Europe) Standard Statistical Classification of Surface Freshwater Quality for the Maintenance of Aquatic Life

Variables affecting aquatic life and their concentration ranges by quality class

		Class I	Class II	Class III	Class IV	Class V
Oxygen regime						
DO (%)	epilimnion (stratified waters)	90-110	70-90, 110-120	50-70, 120-130	30-50, 130-150	<30, >150
	hypolimnion (stratified waters)	90-70	70-50	50-30	30-10	<10
	unstratified waters	90-70	70-50, 110-120	50-30, 120-130	30-10, 130-150	<10, >150
DO (mg/l)		>7	7-6	6-4	4-3	<3
COD-Mn (mg O_2/l)		<3	3-10	10-20	20-30	>30
COD-Cr (mg $O_{2/l}$)		-	-	-	-	-
Eutrophication[a]						
Total P (µg/l)		<10 (<15)	10-25 (15-40)	25-50 (40-75)	50-125 (75-190)	>125 (>190)
Total N (µg/l)		<300	300-750	750-1,500	1,500-2,500	>2,500
Chlorophyll a (µg/l)		<2.5 (<4)	2.5-10 (4-15)	10-30 (15-45)	30-110 (45-165)	>110 (>165)
Acidification						
pH (values <9.0 only)[b]		9.0-6.5	6.5-6.3	6.3-6.0	6.0-5.3	<5.3
Alkalinity (mg $CaCO_3$/l)		>200	200-100	100-20	20-10	<10
Metals						
Aluminium (µg/l; pH 6.5)		<1.6	1.6-3.2	3.2-5	5-75	>75
Arsenic (µg/l)[c]		<10	10-100	100-190	190-360	>360
Cadmium (µg/l)[d]		<0.07	0.07-0.53	0.53-1.1	1.1-3.9	>3.9
Chromium (µg/l)[c]		<1	1-6	6-11	11-16	>16
Copper (µg/l)[d]		<2	2-7	7-12	12-18	>18
Leader (µg/l)[d]		<0.1	0.1-1.6	1.6-3.2	3.2-82	>82
Mercury (µg/l)[d]		<0.003	0.003-0.007	0.007-0.012	0.012-2.4	>2.4
Nickel (µg/l)[d]		<15	15-87	87-160	160-1400	>1400
Zinc (µg/l)[d]		<45	45-77	77-110	110-120	>120
Chlorinated micropollutants and other hazardous substances						
Dieldrin (µg/l)		n.a.	n.a.	<0.0019	0.0019-2.5	>2.5
DDT and metabolites (µg/l)		n.a.	n.a.	<0.001	0.001-1.1	>1.1
Endrin (µg/l)		n.a.	n.a.	<0.0023	0.0023-0.18	>0.18
Heptachlor (µg/l)		n.a.	n.a.	<0.0038	0.0038-0.52	>0.52
Lindane (µg/l)		n.a.	n.a.	<0.08	0.08-2.0	>2.0
Pentachlorophenol (µg/l)		n.a.	n.a.	<13	13-20	>20
PCBs (µg/l)		n.a.	n.a.	<0.014	0.014-2.0	>2.0
Free ammonia (NH_3)		n.a.	n.a.	-	-	-
Radioactivity						
Gross-alpha activity (mBq/l)		<50	50-100	100-500	500-2500	>2500
Gross-beta activity (mBq/l)		<200	200-500	500-1000	1000-2500	>2500

Note: measures falling on the borderline between classes are to be classified in the lower numbered class

a bracketed data refer to flowing water

b Values >9.0 are disregarded in classification

c Applicable for hardness from abut 0,5 meq/l to 8 meq/l. Arsenic V (chromium III) to be converted to arsenic III (chromium VI).

d Applicable to hardness from about 0.5 meq/l to 8 meq/l

n.a. not applicable

ANNEX 4

OVERVIEW OF PARAMETERS ROUTINELY MONITORED IN SURFACE WATERS IN MOLDOVA

Group	**Parameter**	**Sanepid**	**Hydromet**	**Ecological Inspectorate**	**shared by**
general physical	CO3		X		
	free dissolved CO2		X		
	pH	X	X		
	Suspended solids		X	X	
	transparency		X		
	Water color	X			
	Water odour	X			
	Water temperature		X	X	
	Water turbulence	X			
oxygen regime	BOD5	X	X	X	all
	COD, Cr	X	X	X	all
	COD, Mn		X		
	oxygen dissolved	X	X	X	all
	oxygen saturation		X		
major ions	Alkalinity		X		
	Ca		X	X	
	Cl	X	X	X	all
	conductivity		X		
	Hardness	X		X	
	HCO3		X		
	K		X	X	
	Mg	X	X	X	all
	Mineralisation (total salts)	X		X	
	Na		X	X	
	SO4	X	X	X	all
	total dissolved salts		X		
nutrients	Kleldahl nitrogen		X		
	NH4	X	X	X	all
	NO2	X	X	X	all
	NO3	X	X	X	all
	orthophosphate		X	X	
	Silicates		X		
	total phosphour		X		
metals	Cd	X	X		
	Co			X	
	Cr	X	X		
	Cr 3+			X	
	Cr 6+			X	
	Cu	X	X	X	all
	Fe	X	X		
	Fe2+			X	
	Fe3+			X	

Group	**Parameter**	**Sanepid**	**Hydromet**	**Ecological Inspectorate**	**shared by**
	Mn	X	X		
	Ni	X	X	X	all
	Pb	X	X	X	all
	Zn	X	X	X	all
various	anionic active surfactants		X		
	Detergents	X		X	
	F	X			
	Floating materials			X	
	Grease			X	
	Oil products	X	X	X	all
	PCBs(7)		X		
	Phenols	X	X		
	Technical oil			X	
pesticides	a-HCH		X		
	Atrazin	X			
	Bazudin			X	
	b-HCH		X		
	Carbamid			X	
	Carbafos			X	
	DDD		X		
	DDE		X		
	DDT	X	X		
	Dieldrin	X			
	Endrin	X			
	Hexaclorocyclohexan	X	X		
	Metafos			X	
	organochlorinated pesticides		X		
	Simazin	X			
	sum a-HCH + c-HCH			X	
	sum DDE+DDT+DDD			X	
microbiology	Coli fagi	X			
	E.coli	X			
	Helminthes	X			
	Latoza positive bacteria	X			
	Pathogens	X			
	Total number of microbes	X			
	Viruses	X			
total	**81**	**41**	**47**	**38**	**15**