The Regional Environmental Center for Central Asia

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# WATER QUALITY STANDARDS AND NORMS IN THE REPUBLIC OF KAZAKHSTAN

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This Report has been prepared by a group of national experts within the EU Project «Harmonization and Approximation of Water Quality Standards and Norms in Central Asia» and UNECE Project «Water Quality in Central Asia». The problems of contemporary surface waters quality management and the draft Report have been reviewed at the regional and national workshops held in Bishkek, Almaty, Dushanbe and Ashgabat in the period from 2008-2009 attended by the related governmental agencies, representatives of scientific, production and non-governmental organizations.

The main goal of this Report is to review the existing situation in relation to water resources conditions, water use and water quality management, the regulatory and legal base to support the governmental agencies authorized for said activities, and to review the procedure, methods and techniques of water quality control and monitoring of quality parameters.

The Report comprises Introduction, the body containing four sections and conclusions and recommendations. The main sections provide the review of the country's hydrographic features; present the qualitative and quantitative parameters of water resources and preliminary assessments of the climate change impact of the qualitative and quantitative parameters of water resources.

They also cover the main problems of waterworks and water facilities of interstate use; review the legislative base and institutional frameworks of water resources management in relation to the qualitative and quantitative parameters; raise the issues of standard setting and assurance of water quality; provide detailed analysis of the existing methods of water quality control and monitoring of qualitative parameters based on the approved standards and regulatory documents. Each section is supported by the relevant conclusions and recommendations.

The Report is ended by the completed Questionnaire serving an actual basis of the Report. The Questionnaire is structured according to the nature of the problem raised and the plan of the problem survey. The questions are linked to the international and national regulatory and legal documents pertaining to the protection and use of water resources.

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# CONTENTS

# THE LIST OF ABBREVIATIONS

| | |
|---|---|
| WB | Water Body |
| AUCS | All Union Construction Standards |
| WF | Water Fund |
| GOST | State Industry Standard |
| P | Pollutant (pollutants) |
| WPI | Water Pollution Index |
| CDW | Collector and Drainage Waters |
| CWR | Committee on Water Resources |
| MoH | The Ministry of Health |
| MEP | The Ministry of Environmental Protection |
| ICS | Interstate Construction Standards |
| MoA | The Ministry of Agriculture |
| MES | The Ministry of Emergency Situations |
| MEMR | The Ministry of Energy and Mineral Resources |
| RD | Regulatory Documents |
| TSEL | Tentative Safe Exposure Level |
| E | Environment |
| OST | Industry Standard |
| MPC | Maximum Permissible Concentration |
| MPD | Maximum Permissible Discharge |
| RSE | Republican State Enterprise |
| RK | The Republic of Kazakhstan |
| RRD | Republican Regulatory Document |
| SanRS | Sanitary Rules and Standards |
| CRS | Construction Rules and Standards |
| CP | Code of Practice |
| TS | Technical Specifications |
| CA | Central Asia |

# INTRODUCTION

The goal of this project is to review and analyze the regulatory and legal base, institutional structure and water quality management practices.

This document describes key approaches and principles in the area of standards and water quality and provides the assessment of the existing institutional and legal frameworks. It also provides the recommendations for the standard setting and management of water quality.

In Kazakhstan, like elsewhere in Central Asia, the conceptual approaches to water quality management remained unchanged from the Soviet Union times. Those are based on the sanitary standard setting that required the observance of the maximum permissible concentrations (MPC) of pollutants contained in water of water bodies. The maximum permissible discharge (MPD) is still calculated based on the MPC disregarding the ecological opportunities of self-purification of water basins. MPD shall be established on the basis of the environmental quality (background conditions of the receiving waters). The maximum permissible discharge shall be established based on the assumption that they do not involve the excess of the pollution level as provided for by the environmental quality standards (MPC) /1/.

To obtain the permit for discharge of pollutants (emissions) in wastewaters into water bodies the project of maximum permissible discharge (MPD) into WB shall be developed and duly approved. The quality standard setting is to establish a set of permissible values for the parameters of water properties and composition in which limits the human health, necessary water use conditions and the well being of a water body are safely assured.

The existing mechanism of water quality standard setting does not view the conditions of ecosystems of water bodies and their response

to the man-induced impact; the mechanism to be used as the tool of water quality management is inefficient either.

The capacities of the regional authorities and enterprises to develop and implement the realistic and economically sound activities of protection and improvement of water quality are strictly limited and inadequate.

The MPC-based approach assumes a full study of the nature of environmental impact and requires sufficient information to be available for its assessment. Application of this approach enables the polluter enterprises to take advantages of the lack or inadequate information concerning the environmental conditions or impact. In addition, the focus on environmental requirements in this approach does not provide incentives for technological innovations.

One of the existing weaknesses of the applied MPD system is that the regional conditions of formation of the surface waters chemical composition are practically disregarded. The rate of natural water self-purification from the incoming pollutants is not always taken into account. Although the literature provides the information of the ratios pertaining to the rates of self-purification of the natural water from pollutants as obtained in laboratory conditions through water body models. However they are normally not used for setting the discharge standards. In this connection, the scientifically sound agreement of the standards of water quality and wastewaters in respect of many pollutants appears to be unfeasible, and the enterprises obtain the permits for exceeded or underrated standard of wastewater discharge. The goals of implementation of water protection activities envisaged the requirements of their efficiency remain nominal.

Imbalanced man-induced load on WB gives rise to degradation of water quality. In this connection, the ecological conditions of many rivers become poor. Water quality standards need to be revised as far as the system of maximum permissible concentrations (MPC) of pollutants and the existing MPD methodologies disregard the ecological capacities of water bodies.

The main condition to resolve the problem is the existence of a unified methodology of establishing and reforming the quality standards for natural waters and the methodologies to identify the quality of ecological conditions of water bodies /2/. The base models for gradual improvement of the existing practices and transition to a complex water resources management in CA may be the European approaches to water quality.

Based on the above, CA countries will need to analyze the institutional, legal and organizational structures in the field of water

quality management and standards and develop the standards and rates of water quality capable of maintaining water sector development and its infrastructure at various management levels including water quality management.

The priority of national and regional actions and interstate cooperation should be the assurance of water quality safety. To this end, the national policies and strategies in the field of protection and use of trans-boundary waters need to be aligned on the basis of the common provisions contained in the international conventions and guiding principles in the sphere of use and protection of the trans-boundary water courses.

The national strategies of water resources use and protection should foresee the transition to ecosystem water resources management, unification of the criteria and target values of water quality parameters, application of agreed methods of data collection and sharing /3/.

# 1. HYDROGRAPHIC FEATURES

## 1.1. Water Resources of Kazakhstan

Kazakhstan is among the countries with sparse water supply in terms of the river flow volume. In the average year of water content the surface (river) water resources of Kazakhstan amount to 100,5 $km^3$ with only 56,5 $km^3$ generated internally. The remaining volume of 44,0 $km^3$ comes from the neighboring countries, China (18,9 $km^3$), Uzbekistan (14,6 $km^3$), Kyrgyzstan (3,0 $km^3$), and Russia (7,5 $km^3$) /4/. Almost half of the volume of water resources originates outside of the country. So, the regulation of issues of shared use of the trans-boundary rivers is of strategic significance to Kazakhstan. Water coming to Kazakhstan is normally of poor quality being polluted by the wastes of industrial enterprises, agriculture and urban effluents /7/.

The situation of water supply varies throughout Kazakhstan. Some areas are quite well supplied with water such as the basin of Yertys, others suffer from water deficit e.g. Magistau Oblast. According to the Program of Conservation and Rational Use of Water Resources, Fauna and Development of the Network of Specially Protected Areas till 2010, the average unit water consumption per capita ranges between 130-25 liters per day.

In the years of low waters the total volume of water resources diminishes to 58 $km^3$ and the volume of resources consumed reduces respectively to 26 $km^3$. So, the water resources available in Kazakhstan range from 26 to 46 $km^3$ due to uneven yearly water content. The reserves of proven i.e. potentially usable freshwater ground waters currently amount to 15,1 $km^3$. The level of use of ground waters is yet low making 11,3% i.e. 1,7 $km^3$ /5/.

The main trans-boundary rivers of Kazakhstan are the Yertys, the Ishim, the Tobol, the Ural, the Syrdarya, the Ile. The Caspian and the Aral seas are also viewed as the transboundary water bodies.

# 2. KAZAKHSTAN WATER RESOURCES MANAGEMENT

## 2.1. Legislative Basea

Water legislation of Kazakhstan is based on the Constitution of the Republic of Kazakhstan and comprises Water Code /8/ and other regulatory and legal documents of the Republic of Kazakhstan. The goals and objectives of water legislation are provided below in line with Water Code.

Goals and objectives of Water Legislation

1. The goals of water legislation of the Republic of Kazakhstan are to reach and maintain the environmentally safe and economically sound level of water use and protection of water fund for the conservation and improvement of living conditions of public and natural environment.

2. The objectives of water legislation of the Republic of Kazakhstan:

- To pursue the national policy in the field of protection and use of water fund;
- To regulate water relations;
- To provide the legal basis for the support and development of sustainable water use and protection of water fund;
- To identify the main principles and lines of the use and protection of water fund;
- To manage the relations in the field of research, exploration, rational and complex use and protection of water resources and waterworks facilities.

The competence of government authorities on water resources management is provided in Table 2-1.

According to the national regulatory document NRD 1.01.03-94/9, the quality standards of surface waters shall include as follows:

- The general requirements of the composition and properties of the surface waters for various types of water use;
- The list of maximum permissible concentrations (MPC) of hazardous substances in waters of water bodies used for the household-drinking and utility needs of the population;
- The list of maximum permissible discharge (MPD) of hazardous substances for the water bodies used for fishery purposes.

The Rules RRD 1.01.03-94 shall regulate the conditions of discharge of return waters to the water courses and water bodies including domestic

and industrial effluents, rainfall, snowmelt and wash waters of the developed areas, discharge waters of amelioration systems and drainage waters as well as various types of economic activities.

Water quality control in the trans-boundary water bodies is provided under bilateral and multilateral international treaties using the agreed upon criteria to assess the surface water conditions.

To ensure public safety the Sanitary-Epidemiological Rules and Standards ref. No.3.02.003.04, Sanitary-Epidemiological Requirements of Protection of Surface Waters from Pollution, have been adopted /10/.

The requirements as applied specifically to the sources of impact reflect the scientific-technical standards. Such standards include the standards of discharge and emissions of hazardous substances (MPHS and MPD) /11,12/, as well as technological, construction, urban development standards and rules containing the requirements of water resources protection.

The rules of development and approval of the standards of maximum permissible hazardous impacts on water bodies have been developed in line with Water Code of Kazakhstan and shall establish the procedure of development and approval of the standards of maximum permissible hazardous impacts (hereinafter MPHI) on water bodies.

**Table 1: Competences of Government Authorities on Water Resources Management**

| Government Authority, Agency Regulation of Activities Level, Subordination | Activities |
|---|---|
| RK MEP<br>Regulation on RK MEP<br>RK Government | RK MEP, pursuant to Water Code, Article 41<br>Involvement of territorial subdivisions of the authorized state body of environmental protection in the implementation of the basin principle of water resources management<br>1. Territorial subdivisions of while implementing the basin principle of water resources management, the authorized state body of environmental protection shall take part in as follows:<br>1) Agreement upon the plans of rational use and protection of water bodies on the basis of the water balances, the schemes of complex use and protection of water resources associated with the relevant basin; |

| | |
|---|---|
| | 2) Monitoring of water bodies of the relevant basin jointly with the authorized body in the field of use and protection of water fund;<br>3) State control in the field of use and protection of water fund within the scope of their competence;<br>4) Preparation of basin agreements and control of their execution within the supervised territory;<br>5) Development of proposals for the state (regional and basin) programs of use, regeneration and protection of water bodies. |
| RK MoES<br>Regulation on RK MoES<br>RK Government | Water Code, Article 10: Relations in the field of use and protection of water fund as regulated by water and other legislation; p. 5. Relations arising in the field of prevention and liquidation of emergency situations of natural and technogenic nature at the water bodies shall be regulated by RK legislation on emergency situations of natural and technogenic nature. |
| RK MoA, CWR of RK MoA,<br>Regulation on RK MoA and in accordance with the Regulation on CWR of RK MoA<br>RK Government | 1. The authorized body in the field of use and protection of water fund shall:<br>1) Take part in the development and implementation of the state policy in the field of use and protection of water fund;<br>2) Elaborate the programs of water sector development;<br>3) Elaborate the schemes of the complex use and protection of water resources for the basins of the main rivers and other water bodies throughout the country;<br>4) Agree upon the unit water consumption rates in the branches of economy;<br>5) Approve the standard rules of general water use;<br>6) Issue, suspend the permits for special water use in the procedure as established by the laws of Kazakhstan;<br>7) Approve the limits of water use by basins and oblasts (cities of the republican status and capitals);<br>8) Develop the procedure of subsiding the services of water supply to agricultural producers and supply of drinking water from the group water supply system of special significance being the non-alternative sources of drinking water supply;<br>9) Provide the state control over the use and protection of water fund;<br>11) Provide the state account of waters and their use, maintain the state water cadastre and state monitoring of water bodies; |

| | |
|---|---|
| | 12) Create the information database of water bodies and ensure the access thereto for all the parties related;<br>13) Approve the regime of use of state-owned water bodies operational and sources of drinking water supply as well as the rules al of waterworks facilities located directly on water bodies;<br>14) Organize the design, survey, scientific-research and engineering activities in the field of use and protection of water fund;<br>15) Participate in the transfer-acceptance and commissioning of waterworks facilities, agree upon the designs of waterworks facilities and construction, dredging and other works that influence the conditions of water bodies;<br>16) Organize the operation of water bodies, waterworks facilities owned by the state;<br>17) Process the cases on administrative violations in the field of water legislation of the Republic of Kazakhstan;<br>18) Prepare and implement the investment water projects;<br>20) Participate in the elaboration of priority lines of interstate cooperation in the field of use and protection of water resources;<br>21) Cooperate with the neighboring countries in the field of regulation of water relations, rational use and protection of the transboundary waters in the procedure as established by the laws of Kazakhstan;<br>22) Develop the rules of establishing water protection zones and belts;<br>23) Develop water balances;<br>24) Organize monitoring and assessment of ameliorative conditions of irrigated lands to be performed by the specialized state institutions;<br>25) Approve the rules of primary water account.<br>2. Decisions of the authorized body in the field of use and protection of water fund as made within the scope of its competence shall be binding on all entities and individuals. |
| Local representative and executive authorities of oblast level (cities of the republican status and capitals) | Water Code, Section 3: State regulation in the field of use and protection of water fund. Chapter 5: State regulation in the field of use and protection of water fund. Article 33: State regulation in the field of use and protection of water fund. P. 1: The state regulation in the field of use and protection of water fund shall be provided by the Government of Kazakhstan, the authorized body in the field of use and protection of |

| | |
|---|---|
| Activities pursuant to the Regulation of RK Government | water fund, local representative and executive authorities of oblast level (cities of the republican status and capitals) within the scope of their competence as established by the laws of Kazakhstan. |
| Basin inspections on regulation of the use and protection of water resources Activities pursuant to the Regulation on CWR of RK MoA | Shall be the regional body (which activities are performed and authorities cover the oblast territories) authorized for the use and protection of water fund with its departments in the oblasts and acting within the scope of competence of the Ministry of Agriculture performing the special executive and control-supervision functions in the field of use and protection of water fund. |
| The Committee of State Sanitary-Epidemiological Supervisions of RK MoH Activities pursuant to the Regulation of RK MoH | Sanitary-epidemiological supervision of the quality of drinking water. |
| The Committee of Geology and Use of Subsoil Reserves of RK MoEMR (ground waters) Regulation on the Committee of Geology and Use of Subsoil Reserves of RK MoEMR | Grants the right of use of subsoil reserves for exploration and production of subsoil industrial and technical waters in the volume exceeding 2 thousand cubic meters per day in the cases as provided for by the Law on Subsoil Reserves and the Use of Subsoil Reserves, for geological survey of the subsoil reserves and construction and/or operation of subsoil facilities apart from exploration and/ or production |
| KazHydroMet RSE Activities pursuant to the Regulation of RK MEP | The state network deals with hydrometeorological observations in line with the established observation programs. Hydrometeorological Center shall be the main forecasting body of KazHydroMet to issue all types of hydrometeorological forecasts and provide them to the government authorities and administration, various types of consumers and public. |

The information contained in the table is in conformity with the regulations concerning the ministries, committees, RSE and local representative and executive authorities taken from the relevant sources.

## 2.2. International Cooperation

The countries of Central Asia have made the first multilateral agreement on the transboundary waters in CA region, the Agreement of Cooperation in the Sphere of Shared Management of Use and Protection of Water Resources of International Sources dated 18 February 1992 between the Republic of Kazakhstan, Kyrgyz Republic, Republic of Uzbekistan, Republic of Tajikistan and Turkmenistan. The countries of the Aral Sea have established the unified regional entities, International Fund for Aral Sea (AFAS) under which jurisdiction the Interstate Coordination Water Management Commission (ICWMC) of Central Asia and the Interstate Commission for Sustainable Development (ICSD) are functioning. The branches exist in all the countries of the region.

The agreement of 1992 between CA countries has essentially set out the principles and practices of water apportioning within the basins of Amudarya and Syrdarya for a certain period of time based on the criteria and within the scopes as stipulated by the Schemes of Complex Use and Protection of Water Resources (CUPWR) adopted in the soviet times for the basins of Amudarya and Syrdarya.

The bilateral and multilateral treaties in the area of transboundary waters in CA region acceded by Kazakhstan are provided in Table 2.

**Table 2. Bilateral and Multilateral Treaties in Respect of Transboundary Waters in CA Region**

| | Treaty | Signatory Countries and/or Parties to the Treaty |
|---|---|---|
| 1 | Agreement between the Republic of Kazakhstan, Kyrgyz Republic, Republic of Uzbekistan, Republic of Tajikistan and Turkmenistan<br>On Cooperation in the Sphere of Shared Management of Use and Protection of Water Resources of International Sources | Kazakhstan, Kyrgyzstan, Uzbekistan, Tajikistan and Turkmenistan |
| 2 | Charter of Basin Water Management Association «Amudarya» | Kazakhstan, Kyrgyzstan, |

| | | |
|---|---|---|
| | | Uzbekistan, Tajikistan and Turkmenistan |
| 3 | Charter of Basin Water Management Association «Syrdarya» | Kazakhstan, Kyrgyzstan, Uzbekistan, Tajikistan and Turkmenistan |
| 4 | Agreement between the Government of the Republic of Kazakhstan and the Government of Kyrgyz Republic on the Use of Waterworks Facilities of Interstate Use on the Rivers of Chu and Talas | Kazakhstan, Kyrgyzstan |
| 5 | Resolution of Heads of Central Asian Countries Concerning Key Areas of the Program of Specific Actions to Improve the Environmental and Socio-Economic Situation in the Aral Sea Basin for the period of 2003-2010 | Kazakhstan, Kyrgyzstan, Uzbekistan, Tajikistan and Turkmenistan |

The Central Asia ICWC shall determine water policy within the region in the interests of all sectors of economy, complex and rational use of water resources, forward-looking water supply program of the region and the measures of implementation. The Commission's executive operating entities are the basin water management associations (BWMA) Amudarya and Syrdarya established before disintegration of the USSR that are responsible for the activities focused on use of water resources associated with the basin of the two major rivers, Amudarya and Syrdarya.

To a certain extent, the achievement is the conclusion of 1998 Agreement on the use of water and energy resources of Syrdarya basin (Kazakhstan, Kyrgyzstan, Uzbekistan) acceded by Tajikistan. The Agreement has played a positive role in terms of regulation of water and energy exchange between the countries of the upper streams of Syrdarya basin (Kyrgyzstan, Tajikistan) and lower reaches of Syrdarya basin (Kazakhstan, Uzbekistan). For the time being a series of multilateral treaties are at the stage of development. In 2003 the Strategy «Rational ad Efficient Use of Water and Energy Resources of Central Asia» has been finalized within the UNECE Special Program for Economies of Central Asia (SPECA).

However the state of international legal base of cooperation between CA countries does not correspond to the nature of the transboundary water problems of the region. The existing agreements

are either deficient in terms of the content and legal form or poorly enforced. The conclusion of new agreements is delayed for various reasons.

## 2.3. Institutional Frameworks of Management, Government Authorities and Structures

The state management in the field of water fund use and protection is carried out by the Government of Kazakhstan, Committee of Water Resources of the Ministry of Agriculture, the authorized agency in the field of use and protection of water fund as well as the oblast-level representative and executive authorities (the cities of republican status and capitals) in the scope of their competences as established by the Government of Kazakhstan.

CWR of MoA shall perform the implementation and control functions in the area of use and protection of water fund. CWR structure has been approved by Governmental Decree of April 6, 2005 ref. No.310 /13/.

CWR of MoA has the regional offices as listed below, basin inspections to regulate the use and protection of water resources:

1. Aral-Syrdarya Basin Inspection to Regulate the Use and Protection of Water Resources, based in Kyzylorda
2. Balkhash-Alakol Basin Inspection to Regulate the Use and Protection of Water Resources, based in Almaty
3. Irtysh Basin Inspection to Regulate the Use and Protection of Water Resources, based in Semei
4. Ishym Basin Inspection to Regulate the Use and Protection of Water Resources, based in Astana
5. Nura-Sarysu Basin Inspection to Regulate the Use and Protection of Water Resources, based in Karaganda
6. Tobol-Torgai Basin Inspection to Regulate the Use and Protection of Water Resources, based in Kostanai
7. Ural-Caspian Basin Inspection to Regulate the Use and Protection of Water Resources, based in Atyrau
8. Shu-Talas Basin Inspection to Regulate the Use and Protection of Water Resources, based in Taraz

The internal regulation of water relations between the oblasts is provided for by the Rules of Regulation of Water Relations between the Oblasts of Kazakhstan, Governmental Decree dated January 9, 2004 No.21 САПП РК, 2004, N 1, page 12) /14/.

## 2.4. Types of Water Use and Water Users

### Types of Water Use (in terms of water quality)

**Household water use** shall include the use of water bodies or their parts as the sources of household and drinking water supply and supply of food processing industries. As per Sanitary-Epidemiological Rules and Standards No.3.02.002.04, "Sanitary-Epidemiological Requirements of Water Quality of Centralized Drinking Water Supply Systems", drinking water should be safe in epidemiological and radiation respect, shall be clean in terms of the chemical composition and shall have favorable organoleptic properties.

**Cultural and general water use** shall include the use of water bodies for public swimming, sports, and recreation. Water quality requirements as established for the cultural and general water use shall apply to all parts of water bodies situated within the populated areas, irrespective of the types of use whether for dwelling, breeding and migration of fish or other aquatic life.

Water quality of fishery water bodies may refer to one of the three categories as follows:

— ***The highest degree of sensitivity*** shall be for the breeding, fattening and wintering sites of fish and other commercial aquatic life species of special significance as well as protection zones of any breeding farms for fish and other aquatic animals and plants;

— ***The first degree of sensitivity*** shall be for the water bodies to be used for the conservation and reproduction of the valuable fish species with high sensitivity to oxygen content;

— ***The second degree of sensitivity*** shall be for the water bodies to be used for other fishery purposes.

*Water users*

As per Chapter 1, The Main Provisions of Water Code, water user shall be a legal entity or individual who, within the procedure as established by the law, is granted the right of use of water resources to satisfy the own needs and/or commercial interests (please refer to Water Code, Article 1).

As per paragraph 1 Article 66 of Water Code, the special water use shall include the use of surface and ground water resources directly from a water body with or without the withdrawal thereof using waterworks or facilities to satisfy the public drinking and household needs, the needs of agriculture, industry, energy sector, fishery and

transport sectors as well as for the disposal of industrial, utility, drainage and other wastewaters into the surface water bodies.

Special water use shall be exercised by legal entities and individuals under permit exclusively for the purposes as specified therein and shall not violate the rights and lawful interests of other persons and inflict harm to environment.

Water users using water bodies of collective use shall respect the mutual interests, shall not embarrass execution of the rights of water use and do harm to each other.

To form the database, the user entities and individuals shall provide the necessary information in the established formats and in the procedure as set by the law.

The user entities and individuals shall exercise the right of water use under the Permit for Special Water Use to be issued by the Basin Inspections of the CWR of MoA. Water users in the projects of Permits for Special Water Use shall make the annual requisitions for certain volumes of water. The volumes consumed shall be specified in the statistical reporting form 2 ТП Vodkhoz and by the end of the year the reports shall be presented to the Basin Inspection Office for analysis and statistics.

# 3. STANDARD SETTING AND ASSURANCE OF WATER QUALITY

## 3.1. Water Quality

**Water Qulaity** as such shall be understood as the characteristics of water composition and properties that determine its usability for specific types of water use (GOST 17.1.1.01-77) /15/ whereby the quality criteria shall be the indicators to be used for the assessment of water quality.

**Maximum permissible concentration in water bodies of household-drinking and cultural and general water use** (MPC) shall be the concentration of a harmful substance in the water that should not, whether directly or indirectly, affect the human body for the entire life period and the health of further generations and should not deteriorate the hygienic conditions of water use.

**Maximum permissible concentration in water bodies to be used for fishery purposes** (MPCP) — shall be the concentration of a harmful substance that should not affect the populations of fish, primarily the commercial fish species.

**Standard setting for water quality** shall be the establishment of a set of permissible values for a water body pertaining to water composition and properties in which limits public health, favorable water use conditions and ecological well-being of a water body are assured in a safe manner.

## 3.2. Water Classification Based on Integral Quality Parameters

A set of the most frequently used parameters to be used for water quality assessment shall include **hydro-chemical index of water pollution by the source of pollution** and **hydrobiological Saprobity index S** /16/.

Normally, water pollution index shall be calculated based on six-seven parameters that may be viewed as hydro-chemical; part of them (concentration of dissolved oxygen, **pH**, biological oxygen demand BOD5) shall be mandatory.

$$\text{ИЗВ} = \sum_{i=1}^{N} \frac{C_i/\text{ПДК}_i}{N}$$

where

$C_i$ — concentration of component (in some cases, the value of parameter);

**N** — the number of parameters to be used to calculate the index;

$\text{ПДК}_i$ — established value for the relevant type of water body.

Subject to the value of pollution source, the parts of water bodies shall be divided into classes (please refer to Table 3). Water pollution indices shall be compared for the water bodies of the same biogeochemical province and of similar type, for one and the same water course (based on the current, time etc.).

**Table 3. Water quality classes subject to water pollution index**

| Waters | Values of pollution source | Water quality classes |
|---|---|---|
| Very clean | upto 0,2 | 1 |
| Clean | 0,2-1,0 | 2 |
| Moderately polluted | 1,0-2,0 | 3 |
| Polluted | 2,0-4,0 | 4 |
| Dirty | 4,0-6,0 | 5 |
| Very dirty | 6,0-10,0 | 6 |
| Extremely dirty | >10,0 | 7 |

From hydrobiological quality parameters, the so-called Saprobity Index for water bodies is widely used in Kazakhstan. The Saprobity Index is calculated based on the individual Saprobity parameters typical of various aquatic communities (phytoplankton, periphyton):

$$S = \frac{\sum_{i-1}^{N} (S_i \bullet h_i)}{\sum_{i-1}^{N} h_i}$$

where

$S_i$ — saprobity value of hydrobiont to be assigned based on the special tables;

$h_i$ — relative occurrence of the indicator organisms (per microscope field);

**N** — the number of selected indicator organisms.

Each species of the surveyed organisms is assigned a certain tentative numeric value of individual Saprobity Index reflecting the set of its physiological and biochemical properties that determine the ability of aquatic dwelling with a certain content of organic substances. For the purpose of statistical reliability of data the sample needs to contain at least twenty indicator organisms with minimum thirty units in the scope of observation.

Table 4 provides the classification of water bodies by saprobity index S in which respect the standards need to be set.

**Table 4. Water quality classes subject to Saprobity index**

| Pollution level | Zone | Saprobity index S | Water quality class |
|---|---|---|---|
| Very clean | Xenosaprobic | up to 0,50 | 1 |
| Clean | Oligosaprobic | 0,50-1,50 | 2 |
| Moderately polluted | a-mezosaprobic | 1,51-2,50 | 3 |
| Polluted | b- mezosaprobic | 2,51-3,50 | 4 |
| Dirty | polysaprobic | 3,51-4,00 | 5 |
| Very dirty | polysaprobic | >4,00 | 6 |

Water pollution index and saprobity index shall be referred to as the integral parameters of conditions. The level of pollution and quality class of water bodies are established subject to micro-biological parameters (please refer to table 5).

**Table 5. Water quality classes based on microbiological parameters**

| Pollution level and water quality class | Microbiological parameters | | |
|---|---|---|---|
| | Total number of bacteria, 106 cells/ml | Number of saprohile bacteria, 1000 cells/ ml | Ratio of total number of bacteria by the number of saprophile bacteria |
| Very clean, I | <0,5 | <0,5 | <1000 |
| Clean, II | 0,5-1,0 | 0,5-5,0 | >1000 |
| Moderately polluted, III | 1,1-1,3 | 5,1-10,0 | 1000-100 |
| Polluted, IV | 3,1-5,0 | 10,1-50,0 | <100 |
| Dirty, V | 5,1-10,0 | 50,1-100,0 | <100 |
| Very dirty, VI | >10,0 | >1000 | <100 |

## 3.3. Legislative Base

In terms of water quality, the legislative base shall include the following documents subject to the type of water use:

— Sanitary-Epidemiological Rules and Standards No.3.02.003.04 «Sanitary-Epidemiological Requirements of Surface Waters Protection from Pollution» /10/.

— Sanitary-Epidemiological Rules and Standards No.3.02.002.04 «Sanitary-Epidemiological Requirements of Water Quality of Centralized Drinking Water Supply Systems» /17/.

— GOST 2874-82 Drinking Water. Hygienic Requirements and Quality Control /18/.

— The List of Maximum Permissible Concentrations (MPC) and Approximate Safe Levels of Impact (ASLI) for Hazardous Substances for Fishery Water Bodies, 1990 /19/.

## 3.4. State Bodies and Agencies to Ensure Water Control and Safety

KazHydroMet RSE of RK MEP shall control water quality of water bodies on behalf of the Government. The network of hydrological observation stations is designed to collect the data on the conditions of water bodies and water resources. 214 hydrological stations provide mandatory observations /20/.

The quality of drinking water to be supplied to the public shall be controlled by the sanitary-epidemiological bodies of RK MoH on behalf of the Government.

The sanitary-epidemiological well being of the public shall be regulated by the Law on Public Sanitary-Epidemiological Well-Being dated 4 December 2002 ref. No.361-II.

*Water of household and drinking quality*: The quality of water shall be assured in line with GOST 2874-82 «Drinking Water. Hygienic Requirements and Quality Control» and SanRS ref. 3.02.002.04 «Sanitary-Epidemiological Requirements of Water Quality of Centralized Drinking Water Supply System».

The quality of water from water trucks shall also meet the requirements of Sanitary-Epidemiological Requirements of Water Quality of Centralized Drinking Water Supply System as approved by Order of acting Minister of Health dated 28 June 2004 ref. 506 registered with the State Registry for Regulatory Legal Documents under 2999.

Water delivered by road transport shall be in special tanks which application is prohibited for other purposes (no technical water is permitted) pursuant to Sanitary-Epidemiological Requirements of Non-Centralized Household an Drinking Water Supply as approved by order of acting Minister of Health dated 13 May 2005 ref. 229. The drinking water supply service staff shall be exposed to regular medical examination pursuant to Order of the Minister of Health dated 20 October 2003 ref. 766 Concerning the Approval of the Rules of Mandatory Medical Examinations of Decreed Groups of Public registered with the State Registry for Regulatory Legal Documents under 2556 /21/, as well as hygienic training pursuant to Order of RK MoH dated September 17, 2003 ref. 688 «On Approval of the Rules of Organization and Delivery of Hygienic Training for Decreed Group of Public» registered with the State Registry for Regulatory Legal Documents under 2531 /22/.

*Bottled drinking water*: Water quality shall be ensured in line with «The Sanitary-Epidemiological Requirements of Production, Quality and Safety of Bottled Drinking Mineral Natural and Artificially Mineralized Waters» as approved by Order of acting Minister of Health of 24 March 2005 ref. 147 /23/. In addition, bottled water shall refer to food products, thereby the quality safety shall also be assured pursuant to «The Instruction of Quality and Safety of Food Products» as approved by Governmental Decree dated 29 November 2000 ref. 1783 /24.

The safety requirements of drinking water shall also be regulated by Technical Regulations «Safety Requirements of Drinking Water for Public» /25/ as approved by Governmental Decree dated 13 May 2008 ref. 456 and Technical Regulations «Safety Requirements of Bottled Drinking Water» /26/ as approved by Governmental Decree dated 9 June 2008 ref. 551.

*Water for Industrial Needs*: The quality of technical water shall meet the quality requirements of technical water of the relevant production process. According to the composition of water of certain sources and water user quality requirements, water treatment plants may be provided where necessary.

*Water for fishery water bodies*: The quality shall be regulated pursuant to the List of Maximum Permissible Concentrations (MPC) and Approximate Safe Impact Levels (ASIL) of hazardous substances for fishery water bodies.

# 4. WATER QUALITY MANAGEMENT

## 4.1. Organization and Methods of Water Quality Control

The rules of water quality control of water courses and water bodies including outflow parts of rivers in terms of physical, chemical and hydro-biological parameters to be ensured by the National Services for Observations and Pollution Control of Environmental Assets (NSOPCEA) shall be set by GOST 17.1.3.07-82 The Rules of Quality Control of Water Bodies and Water Courses /27/. The Standard des not apply to water quality control of water bodies and watercourses to be used for specific purposes under GOST 17.1.1.03-86 and to expedition observations.

The list of water quality parameters of water bodies and watercourses shall be established subject to:

— The intended use of the water body or water course;

— The composition of waste waters discharged;

— The requirements of information users.

Water quality shall be controlled based on special types of programs. The type of program shall be selected subject to the category of the observation station.

The state quality control of surface waters shall be provided by KazHydroMet RSE. Under the programs of environmental monitoring and control and under MPD projects, water user enterprises shall perform the quality control of water resources. In accordance with the monitoring and control programs the enterprises shall compile the reports, and such reports of water user enterprises shall be analyzed by RK MEP bodies.

The systematic information concerning water quality parameters of water bodies and water courses and the opportunity of changing thereof under the influence of economic activities and hydrometeorological conditions shall be provided by the related entities within the established procedure. The information concerning surface water parameters shall be published at the Environmental Information Bulletins to be issued by KazHydroMet RSE. The information environmental bulletins can also be found at the web site of RK MEP.

## 4.2. Monitoring of Quality Parameters

The monitoring of quality of the surface waters shall be provided by KazHydroMet RSE.

Most of the observation stations of the pollution of surface waters are combined with the hydrological stations and points. It is mandatory to identify the hydrological parameters in addition to the hydro-chemical ones (water levels and consumption, average flow velocity etc.).

*Methods of Sampling*

The types of samples, sampling methods and their preferable use are provided in Table Б.1, Types of Samples, Sampling Methods ST RK GOST P 51592-2003.

*Parameters, Sites and Frequency of Monitoring*

The state observation network of the surface waters conditions shall include 214 hydrological sections at 53 rivers, 8 lakes, 12 water reservoirs, 3 channels and 1 sea.

The study of pollution of surface waters in water samples shall determine up to 40 physical and chemical parameters of water quality (ammonia nitrogen, suspended particles, hydrocarbonates, sulfates, chlorides, calcium, hardness, magnesium, sodium, potassium, total iron, silicon carbide, manganese, copper, oil products, nitrates, nitrites, pH, dissolved oxygen, odor, biological oxygen demand (BOD5), chemical oxygen demand (COD), phenols, total phosphorous, specific electric conductivity, fluorides, synthetic surfactants , rhodanates, cyanides, zinc, chrome) /20/.

The main list of pollutants to be determined by KazHydroMet based on hydro-chemical parameters is provided in Table 6 (based on the environmental information bulletin).

**Table 6. The List of Pollutants and Maximum Permissible Concentrations (MPC) Polluting the Surface Waters of the Republic of Kazakhstan**

| Pollutant | MPC for fishery water bodies, mg/dm$^3$ | MPC for the water bodies of the household-drinking and utility water use, mg/dm$^3$ | Hazard class |
|---|---|---|---|
| Chrome ($3^+$) | 0,005 | 0,5 | 3 |

| | | | |
|---|---|---|---|
| Chrome ($6^+$) | 0,02 | 0,05 | 3 |
| Ferrum (total) | 0,1 | | |
| Ferrum ($2^+$) | 0,005 | 0,3 | 3 |
| Ferrum ($3^+$) | 0,5 | | |
| Zinc ($2^+$) | 0,01 | 1,0 | 3 |
| Mercury ($2^+$) | 0,00001 | 0,0005 | 1 |
| Cadmium | 0,005 | 0,001 | 2 |
| Arsenic | 0,05 | 0,05 | 2 |
| Bohr ($3^+$) | 0,017 | 0,5 | 2 |
| Copper ($2^+$) | 0,001 | 1,0 | 3 |
| $BOD_5$ | 3 mg $O_2$/l | 3 mg $O_2$/l | |
| Phenols | 0,001 | 0,001 | 4 |
| Oil products | 0,05 | 0,3 | 4 |
| Fluorides | 0,05 (not exceeding the total content of 0,75) | 1,5 | 2 |
| Nitrites | 0,08 (0,02 for N) | 3,3 | 2 |
| Nitrates | 40,0 (9,1 for N) | 45,0 | 3 |
| Salt ammonia | 0,5 (0,39 for N) | | 4 |
| Cadmium | 0,001 | | 2 |
| Sulfates | 100,0 | | cond 4 |
| Magnesium | 40,0 | | cond 4 |
| Manganese | 0,01 | | 3 |
| Nickel | 0,01(10 mc/g) | | 3 |

The quality control stations of water bodies and watercourses shall be divided into categories I, II, III and IV. The station categories and their location shall be determined within the established procedure in view of the set of factors, economic purpose of the water body, water quality, the size and capacity of the water body, the size and water content of the water course and other factors.

The control stations of various categories shall be located at the medium-size and large water bodies and courses under GOST 17.1.1.02-77 /28/.

The control stations of the breeding and wintering sites of valuable commercial species shall be located under GOST 17.1.2.04-77 /29/;

The frequency of control based on hydrological and hydro-chemical parameters shall be established subject to the category of the control station (Table 7).

**Table 7. The Frequency of Control Based on Hydrological and Hydro-chemical Parameters**

| Frequency of control | Control program for control stations, categories | | | |
|---|---|---|---|---|
| | I | II | III | IV |
| Daily | Restricted program 1 | Visual observations | — | — |
| Every ten days | Restricted program 2 | Restricted program 1 | — | — |
| Monthly | Restricted program 3 | | | |
| During the main phases of water regime | Mandatory program | | | |

The overlapping time of control under various programs shall subject to the frequency conditions as established in Table 8.

**Table 8. Control under various programs, frequency of control**

| Frequency of control | Control program for control stations, categories | | | |
|---|---|---|---|---|
| | I | II | III | IV |
| Every ten days | Restricted program 2 and additionally restricted program 1 | — | — | — |
| Monthly | Restricted program 3 and additionally restricted program 1 | | Restricted program 3 | — |
| During the main phases of water regime | Mandatory program and additionally restricted programs 1 and 3 | | | Mandatory program |

The frequency of control for hydro-biological parameters shall be in accordance with Table 9.

**Table 9. The Frequency of Control Based on Hydro-biological Parameters**

| Frequency of control | Control program for control stations, categories | | | |
|---|---|---|---|---|
| | I | II | III | IV |
| Monthly | Restricted program | | Restricted program * | — |
| Quarterly | Full program | | | |

** Control shall be conducted during vegetation period*

In the occurrence of the new sources of pollution, changes in the capacity, composition and conditions of wastewater discharge into the same water sources and the other existing conditions, the category of the control station, frequency of control and the list of water parameters to be determined may be amended within the established procedure.

*Sampling Sites*

The control stations shall be established in view of the conditions and use prospects in respect of a water body or watercourse on the basis of preliminary survey that should include as follows:

— Collection and analysis of the information concerning water users, sources of water pollution, emergency discharges of pollutants, regime, physical and geographic, morphometric properties of a water body or watercourse;

— Survey of water body or watercourse in order to determine their conditions and the coastal protection zones, identify the additional sources of pollution, areas of high pollution density and the list of specific pollutants, identify parameters of biotopes.

The control stations shall include one or more hydrological sections. The hydrological sections shall be established in view of hydrometeorological and morphometric features of the water body or watercourse, the location of pollution sources, the volume and composition of wastewaters discharged, user interests in line with the rules of surface waters protection from wastewater pollution.

*Sampling and Pre-processing*

Sampling and pre-processing shall be in compliance with RK ST GOST P 51592-2003 Water. General Requirements of the Organization and Quality Control Methods /30/ setting the general requirements of sampling, transportation and preparation for storage of water samples designed for determining the parameters of water composition and properties.

GOST P 51592-2003 shall apply to any types of waters and establish the general requirements of sampling, transportation and preparation for storage of water samples designed for determining the parameters of water composition and properties.

*Transportation and Storage*

When transporting, the tanks should be placed inside the tare (container, box, case etc.) to prevent contamination and damage of the containers with samples. The tare should be designed so that to prevent spontaneous opening of tank plugs.

Tanks containing samples shall be packed in a way as to make sure that the package does not affect the sample composition and causes no loss of the parameters to be identified when being transported and protects the tanks from potential external pollution and damage,

The samples to be exposed to immediate testing shall be grouped separately and sent to the laboratory.

*Laboratory Test*

The general requirements of the laboratory competence shall be established by RK ST ISO/IEC 17025-2007 General Requirements of the Competence of Testing and Calibration Laboratories (ISO/ 1EC17025:2005 General requirements of the competence of testing and calibration laboratories (IDT)) /31/. Said standard shall set the general requirements of the competence of laboratories for testing and/or calibration including sampling and covers the tests and calibrations to be carried out based on the standard methods, unconventional methods and the in-house designed methods.

The Standard shall apply to all organizations engaged in testing and/or calibration. Those include e.g. the first-, second-, third party laboratories and the laboratories performing testing and/or calibration as part of product control or certification.

The general requirements of certification bodies shall be in line with RK ST ISO/IEC 65-2001 General Requirements for Bodies Operating Product Certification Systems /32/.

RK ST ISO/IEC 65-2001 shall set the requirements which compliance is focused on the assurance that the certification bodies

operate the third party certification systems consistently and safely thus facilitating their acceptance on the national and international basis and contributing to international trade development.

The standard in question shall set the general requirements that the organization, dealing with product certification, shall meet in order to be recognized as a competent and trustworthy product certification body (hereinafter referred to as the product certification body).

# GENERAL CONCLUSIONS AND RECOMMENDATIONS

This document covers key approaches and principles in the area of water standards and quality, assesses the existing institutional and legal frameworks and proposes the recommendations in respect of water quality standard-setting and management.

**Conclusions for Chapter 1**

The management of water resources associated with the transboundary rivers is very significant for Kazakhstan, as far as almost half of the total volume of water resources inflow from the neighboring countries, at the same time a considerable part of water resources outflow from Kazakhstan to the other countries.

In Kazakhstan, water consumption per capita ranges from 130 to 250 liters/day.

Basically, water incoming to Kazakhstan is of poor quality as being contaminated by the wastewaters of industrial enterprises, agriculture and urban effluents.

**Conclusions for Chapter 2**

In Kazakhstan, the management of water resources and water quality are regulated by the environmental and water protection laws.

The shared management of water resources use and protection shall be governed by a number of agreements of cooperation between Kazakhstan, Kyrgyzstan, Uzbekistan, Tajikistan and Turkmenistan.

It follows from the analysis of practices to implement water agreements that their efficiency is low when it comes to addressing the existing environmental, economic and social issues. The state of international legal base of cooperation between CA countries does not meet the nature of the transboundary water problems. The existing

agreements are either inadequate from the standpoint of the content and legal form or poorly executed.

**Conclusions for Chapter 3**

The standard setting and assurance of water quality shall be within SanRS, GOST and other regulatory and legal documents regulating the requirements of water quality, subject to specific types of water use.

The conceptual approaches and requirements of water quality management remain unchanged from the soviet times and are based on the sanitary standard setting that required the adherence to the maximum permissible concentrations (MPC) of pollutants in water bodies.

The standards of wastewater discharge to be established shall ensure the quality standards (MPC) at the control sections of the water body located downstream of the wastewater discharge. Until the present, the maximum permissible discharge (MPD) shall be calculated based on MPC disregarding the environmental capabilities of self-purification of water basins.

MPC-based approach assumes the full survey of the nature of environmental impact and requires the sufficient information for its assessment. The application of such approach enables the polluter enterprises to take advantages of the lack or inadequate information concerning the environmental conditions or impact. In addition, the focus on environmental requirements in this approach does not provide incentives for technological innovations.

One of the existing weaknesses of the applied MPD system is that the regional conditions of formation of the surface waters' chemical composition are practically disregarded. The rate of natural water self-purification from the incoming pollutants is not always taken into account. Although the literature provides the information of the ratios pertaining to the rates of self-purification of the natural water from pollutants as obtained in laboratory conditions through water body models.

**Conclusions for Chapter 4**

Water quality management and organization of quality control in Kazakhstan are in line with the effective regulatory-legal documents.

Monitoring of qualitative conditions of surface waters shall be provided by KazHydroMet RSE. The state observation network of the surface waters conditions shall include 214 hydrological sections at 53 rivers, 8 lakes, 12 water reservoirs, 3 channels and 1 sea.

The study of pollution of surface waters in water samples shall determine up to 40 physical and chemical parameters of water quality.

The main pollutants of the trans-boundary rivers are the total mineralization, sulfates, hardness, phenols, pesticides, occasionally oil products, nitrogen group, copper, zinc.

According to the Information water of Quality Bulletin, the Yertys, the Yesil (Ishim), the Ural are qualified as «clean rivers» within Kazakhstan; the Tobol, the Syrdarya, the Ile, the Talas, the Chu are qualified as «moderately polluted» showing the excess of permitted standards for certain pollutants /33/. Degradation of water quality in the Syrdarya, the Talas and the Chu is connected with the discharge of waste and collector and drainage waters (CDW) directly into the rivers practically without any treatment. Degradation of water quality in the Ile is due to the inflow of pollutants from China as well as the polluted surface flow and run-offs from the agricultural lands adjacent to the basin. Waters of the Ural are polluted in Russia. In Kazakhstan there is no wastewater discharge into the riverbed. The inflowing waters of the main tributary, the Ilek, contain a number of specific pollutants (chrome, bromine, fluoride).

**The General Conclusions**

The main condition to address the issue of water quality standards and norms is the existence of a unified anified methodology of establishing and reforming the quality standards for natural waters and the methodologies to identify the quality of ecological conditions of water resources.

To this end, the methodology of setting the sound standards of water quality associated with the natural water bodies needs to be elaborated along with the options of gradual transformation of such standards into the discharge standards (as a condition for the discharge licensing) that will be efficient and workable to the extent required.

Therefore, the potential transition to the unified classifier of water bodies in view of their ecological conditions and the methods of determination of the ecological conditions of water bodies will not only ensure the unified methodology and methods within CA countries but also assure the conservation of water quality in water bodies.

The base models for gradual improvement of the existing practices and transition to a complex water resources management in CA may be the European approaches to water quality.

To harmonize the standards of water quality, the projects implemented on behalf of RK Government are underway. The agencies responsible for such projects are MoA and MEP.

Said activities are for the purposes of the commitments under the Convention on Protection and Use of Transboundary Watercourses and International Lakes and in line with the water quality management plan; the projects to be implemented shall include as follows:

— Setting the maximum standards for the content of pollutants in the discharges into surface waters from the point sources based on the best technologies available.

— Development of target water quality parameters.

— Development and approval of water quality criteria.

The reformation of water quality standards is in line with the regulatory-legal documents as follows:

1. Water Code dated 09.07.2003, Article 83, 87, 141;

2. Environmental Code dated 09.01.2007, Articles 23, 24:

3. The Convention on Protection and Use of Transboundary Watercourses and International Lakes, Helsinki, 1992.

4. Decree of the Government of the Republic of Kazakhstan dated 11 October 2006, ref. No.978 concerning the Conclusion of Agreement between the Government of the Republic of Kazakhstan and United Nations Development Program within the project «National Plan of Integrated Water Resources Management and Water Saving for the Republic of Kazakhstan».

5. Agreement between the Government of the Republic of Kazakhstan and United Nations Development Program within the project «National Plan of Integrated Water Resources Management and Water Saving for the Republic of Kazakhstan».

**Recommendations**

Based on the conclusions, for the purpose of potential planning the subsequent steps and regulation of the standards and norms of water quality in CA, the following goals need to be achieved:

- To develop the joint action plans in the field of management and regulation of water quality norms and standards
- Gradual transition to the unified classifier of water bodies in view of their ecological conditions and the methodology of determining the ecological state of water bodies.
- To strengthen technical and institutional opportunities between CA countries.

Annex

## Questionnaire for The NATIONAL REPORT Preparation

## STANDARDS AND NORMS OF WATER QUALITY IN THE REPUBLIC OF KAZAKHSTAN

| | | | |
|---|---|---|---|
| Republic of Kazakhstan<br>Almaty<br>CAREC Expert — A. Jumagulov, Candidate of Technical Sciences<br>Agency — Kazakhstan Agency of Applied Ecology<br>Date of issue — 23.02.2009 | | | |
| ***1 Management of water resources and water quality***<br><br>***The main document regulating water legislation in the country*** | | | |
| 1a | In place Yes | Title of the document:<br>RK Water Code | Date of issue<br>9 July 2003 |
| ***Water legislation of Kazakhstan (Water Code) is based on the legislative documents such as:*** | | | |
| 2a | Environmental Code | Yes | Date of adoption<br>9 January 2007 |
| 2b | Land Code | Yes | 20 June 2003 |
| 2c | Constitution | Yes | 5 September 1995 |
| 2d | The Law on sanitary-Epidemiological Wellbeing | Yes | 4 December 2002 |
| ***The aim of water legislation of Kazakhstan (Water Code)*** | | | |
| 3a | Management of qualitative/ quantitative water and environmental parameters | | Yes |
| 3b | Achievement and maintaining the environmental safety and economically efficient level of water use and protection of water fund in order to conserve and enhance the living conditions of public and environment | | Yes |
| 3c | Achievement of optimal water use level between the neighboring countries | | Yes |
| 3d | Maintaining the environmentally safe water level | | Yes |

| | | |
|---|---|---|
| ***State management in the field of water fund use and protection is provided by:*** | | |
| RK Government, the authorized body in the area of use and protection of water fund (hereinafter WF), RK Ministry of Environmental Protection (RK MEP), RK Ministry of Emergency Situations (MES).<br>The Ministry of Agriculture (RK MoA), the Fishery Committee and Interstate Coordination Water Management Commission (ICWMC)<br>Committee of Water Resources (CWR of RK MoA)<br>Oblast-level representative and executive authorities (cities of republican status, capitals) - within the scope of competences as established by the laws | | Yes |
| ***Management structure in the field of use and protection of water fund*** | | |
| 5a | Interstate | Yes |
| 5b | State | Yes |
| 5c | Basin | Yes |
| 5d | Territorial | Yes |
| ***General requirements of the composition and properties of the surface waters for various types of water use are regulated by the document*** | | |
| 6b | RRD 1.01.03-94 The Rules of Surface Waters Protection | Yes |
| ***The substance of water quality standard setting ...*** | | |
| 7c | Is to establish a set of permissible values for a water body pertaining to water composition and properties in which limits public health, favorable water use conditions and ecological well-being of a water body are assured in a safe manner | Yes |
| ***Types of water use*** | | |
| 8a | Household and drinking | Yes |
| 8b | Cultural and general | Yes |
| 8c | Fishery | Yes |
| ***Frequently used integral indicators to evaluate water quality in water bodies*** | | |
| 10b | Hydro-chemical index of water pollution (IWP) and Hydro-chemical saprobity index (S) | Yes |

| | | |
|---|---|---|
| ***Mandatory elements to calculate the index of water pollution (IWP):*** | | |
| 11d | Dissolved oxygen, hydrogen ion exponent pH, Biochemical oxygen demand (BOD) | Yes |
| ***GOST's establishing the general requirements of sampling, transportation and preparation for storage of water samples designed for the analysis of water composition and properties*** | | |
| 12c | GOST P 51592-2003 Water. General Sampling Requirements. | Yes |
| ***Are the disposable containers acceptable for sampling?*** | | Yes |
| ***For storage of the samples containing light sensitive ingredients (including seaweed) the containers are used that are*** | | |
| 14c | Made of light-proof or non-actinic glass with further placement into light-proof tare for the whole storage period | Yes |
| ***For point sampling at a predetermined depth the applicable device is the*** | | |
| 15b | Sampling bottle | Yes |
| ***General Requirements of Quality Control Organization and Methods are Regulated by*** | | |
| 16b | GOST P 51232-2003 Water. General Requirements of Quality Control Organization and Methods | Yes |
| ***Pursuant to Water Code, the use and protection of water fund is controlled on the levels as follows*** | | |
| 17d | State, industrial and public | Yes |
| ***Which governmental agency controls water quality of water bodies?*** | | |
| 18b | KazHydroMet RSE of RK MEP | Yes |
| ***Which document provides the official data of water quality in water bodies?*** | | |
| 19a | Information Environmental Bulletin, KazHydroMet RSE | Yes |
| ***Are the official data on water quality in water bodies available for the public?***<br>*Yes, the information is available and may be obtained from:*<br>*1 KazHydroMet RSE (subject to official request).*<br>*2 RK MEP web site:* http://www.eco.gov.kz/ekolog/ekolog.php<br>*3 Specialized libraries in Kazakhstan* | | Yes |
| ***21 Who else controls the quality of water in water bodies in accordance with the water legislation?*** | | |
| 21a | Water user enterprises | Yes |
| 21b | Public organizations | Yes |

| | | |
|---|---|---|
| ***22 Do the water user enterprises control water quality in water bodies?*** | | |
| 22b | Yes, in accordance with Water Code and in line with the program of ecological control (PEC); in the cases where the projects envisage waste water discharges - maximum permissible discharge (MPD) | Yes |
| ***23 Which agencies analyze the monitoring reports provided by the user enterprises?*** | | |
| 23c | The authorized body of the Ministry of Environmental Protection (RK MEP) | Yes |
| ***24 As per GOST the place and frequency of sampling are established in accordance with:*** | | |
| 24c | Research program subject to the water body | Yes |
| ***25 The general requirements of sampling equipment are provided in*** | | |
| 25b | GOST 17.1.5.04-81 Nature Protection. Hydrosphere. Equipment and Devices for Sampling, Pre-Processing and Storage of Samples of Natural Waters. General Technical Specifications. | Yes |
| ***26 The terms and definitions of the main notions pertaining to water quality are contained in*** | | |
| 26c | GOST 27065-86 «Water quality. Terms and Definitions» | Yes |
| ***27 Water quality is determined (by testing) by the laboratories*** | | |
| 27c | Certified irrespective of the type of ownership | Yes |
| ***28 Safety of water quality*** | | |
| 28a | Sanitary-Epidemiological Rules and Standards No.3.02.002.04 «Sanitary-Epidemiological Requirements of Water Quality of Centralized Drinkking Water Supply Systems»<br>*Drinking water should be safe in epidemiological and radiation respect, shall be clean in terms of the chemical composition and shall have favorable organoleptic properties* | Yes |
| ***29 Can the standards of water quality be amended?*** | | |
| 29a | Yes, sanitary-epidemiological rules and standards on water quality shall be adopted by the order of the Minister of Health | Yes |
| ***30 Which document determines the list of substances to be tested?*** | | |
| 30a | GOST 17.1.3.07-82. Nature Protection. Hydrosphere. The Rules of Water Quality Control of Water Bodies and Courses. Interstate Standard | Yes |
| ***31 The list of tested substances is determined for the purposes as follows*** | | |
| 31a | The list of water quality parameters for water bodies and water courses is determined in view of: | Yes |

| | | |
|---|---|---|
| | — Intended use of water bodies and water courses;<br>— The composition of waste waters discharged;<br>— Requirements of the information consumers. | |
| ***32 Who is entitled to amend the list of substances to be tested?*** | | |
| 32a | The authorized body in the field of use and protection of water fund | Yes |
| ***33 . Can GOST's be amended? Which is the mechanism of such procedure? Which agency is to approve, review and implement?*** | | |
| 33a | Yes. GOST's are amended in accordance with the legislation. GOST's are established for a certain period of time and may be abolished upon expiry or subject to issue/adoption of the new standards. The review, approval, amendment and implementation are carried out by the authorized bodies. | Yes |
| ***34 Is there any need of transition to the other standards?*** | | |
| 34b | The National Plan for Integrated Water Resources and Water Saving Management assumes the unified methodology and methods of water quality determination | Yes |
| 34c | The country is a party to Convention on the Protection and Use of Transboundary Water Courses (Helsinki, 1992) | Yes |
| 34d | As per the Convention (Helsinki, 1992) the unified water quality target parameters and criteria are under development in Kazakhstan | Yes |
| ***35 The government authorities may involve the public and public associations in the development of programs and implementation of activities on the rational use and protection of water fund*** | | |
| 35a | The provision is contained in Water Code | Yes |
| ***36 The names and functions of the state authorities (ministries, committees) that perform the implementation and control functions in the field of use and protection of water fund - Committee of Water Resources of the Ministry of Agriculture*** | | Yes |
| ***37 Ministries/ committees have the regional offices, the basin inspectorates on regulation of the use and protection of water resources in oblasts/towns:***<br>*RK MoA / Committee of Water Resources have the regional bodies, basin inspections to regulate the use and protection of water resources in Almaty, Astana, Atyrau, Karaganda, Kyzylorda, Kostanai, Semipalatinsk, Taraz* | | Yes |
| ***38 In accordance with the law (Water Code etc.) the control tasks in the field of use and protection of water fund are as follows:*** | | |
| 38b | Observations of water conditions and changes under the influence of economic and other activities; check of the accomplishment of | |

| | | |
|---|---|---|
| | water protection activities | Yes |
| ***39 Individuals may apply to the government authorities and agencies with requests, complaints, petitions and proposals regarding the use and protection of water bodies and may require administration thereof*** | | Yes |
| ***40 Individuals may require the abolishment in either administrative procedure or by court of the decisions concerning the location, construction, reconstruction and commissioning of the enterprises and other facilities being inconsistent with the requirements of the use and protection of water fund; and concerning the restriction and suspension of economic activities of the individuals and legal entities having the adverse impact on water bodies*** | | Yes |
| ***41 . Representatives of public associations (PA) may take part in the activities of the basin councils*** | | Yes |
| ***42 Public associations on their own initiative may carry out public control in the field of use and protection of WF*** | | Yes |
| ***43 The procedure of public control in the field of use and protection of WF is being established by:*** | | |
| 43b | By public associations in line with their charters upon consent of the authorized state bodies providing state control in the field of the use and protection of water fund. | Yes |
| ***44 Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Helsinki, 17 March 1992)*** | | |
| 44a | The country is a party to the Convention. The date of accession \ ratification, decree number | Yes |
| The convention was ratified by Kazakhstan (The Law of the Republic of Kazakhstan on Accession to the Convention on Protection and Use of Transboundary Watercourses and International Lakes dated 23 October 2000 ref. No.94-II) | | |
| ***45 The joint water condition monitoring and assessment are performed under the Convention (Helsinki)*** | | |
| 45a | The joint monitoring programs for the conditions of transboundary waters are developed and implemented with the other CA countries | Yes |

# ANNEXES (THE LIST OF REGULATORY DOCUMENTS)

1. RK Water Code, 2003
2. GOST 17.1.1.01-77 Nature Protection. Hydrosphere. The Use and Protection of Waters. The Main Terms and Definitions. Standards Publisher 1982
3. GOST 17.1.1.02-77. Nature Protection. Hydrosphere. Classification of Water Bodies. Standards Publisher 1977
4. GOST 17.1.2.04-77 Nature Protection. Hydrosphere. Indicators of Conditions and the Rules of Taxation of Fishery Water Bodies. Standards Publisher 1977.
5. GOST 17.1.3.07-82 The Rules of Water Quality Control in Water Bodies and Water Courses. Standards Publisher 1982.
6. GOST 2874-82 Drinking Water. Hygienic Requirements and Quality Control. Standards Publisher 1982.
7. RRD 1.01.03-94 The Rules of Surface Waters Protection
8. Sanitary-Epidemiological Rules and Standards No.3.02.002.04, «Sanitary-Epidemiological Requirements of Water Quality of Centralized Drinking Water Supply Systems»
9. Sanitary-Epidemiological Rules and Standards No.3.02.003.04 «Sanitary-Epidemiological Requirements of Surface Waters Protection from Pollution»
10. ST RK GOST P 51592-2003 Water. General Requirements of Quality Control Organization and Methods, Astana 2003
11. ST RK ISO/IEC 17025-2007 General requirements for the competence of testing and calibration laboratories (IDT), Astana 2007.
12. ST RK ISO/IEC 65-2001 General requirement for the bodies operating product certification systems, Astana 2001.

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2. M. Burlibayev, A. Jumagulov, D. Burlibayeva, Concerning the Transition to the European Classification of water Bodies and the Methods of Determining the Ecological State of Rivers // Hydrometeorology and Ecology, issues 2-3. - Almaty, 2008. P. 143-150.
3. T. Sarsembekov, H. Sarsembekov, Transboundary Problems of Assuring Safe Water Supply in Central Asian Countries (http://www.vkh21.ru/articles/view/15.htm)
4. Water Resources of Kazakhstan in the New Millennium. UNDP Kazakhstan, Almaty, 2004 - p. 132
5. The State Program of Kazakhstan Rural Territories Development for 2004-2010 (Presidential Decree dated 10 July 2003, N 1149).
6. National Atlas of the Republic of Kazakhstan, Almaty 2006.
7. http://www.cawater-info.net/library/rus/kenshimov_jumanbaeva.pdf.
8. Water Code of the Republic of Kazakhstan, 2003
9. The Rules of Surface Waters Protection from Pollution PK. RRD 1.01.03-94.
10. Sanitary-Epidemiological Rules and Standards 3.02.003.04 «Sanitary-Epidemiological Requirements of Surface Waters Protection from Pollution».
11. The Rules of Development and Approval of the Standards for Maximum Permissible Harmful Impacts on Water Bodies as approved by Governmental Decree of 19 January 2004, 50.
12. Instruction on Standard Setting for the Discharge of Pollutants into Water Bodies, Astana, 2005.
13. Regulation on the Committee on Water Resources of RK Ministry of Agriculture as approved by Governmental Decree of 6 April 2005 310.
14. The Rules of Water Relations Regulation between the Oblasts of Kazakhstan Governmental Decree dated 9 January 2004 21 САПП РК, 2004, 1, p.12.
15. GOST 17.1.1.01-77 Nature Protection. Hydrosphere. The Use and Protection of Waters. The Main Terms and Definitions. Standards Publisher 1982.

16. T. Guseva, Ya. Molchanova, E. Zaika, B. Vinichenko, E. Averochkin. Hydro-chemical Parameters of Environmental Condition, Reference Materials. Ecoline, 1999.
17. Sanitary-Epidemiological Rules and Standards No.3.02.002.04, «Santary-Epidemiological Requirements of Water Quality of Centralized Drinking Water Supply Systems».
18. GOST 2874-82 Drinking Water. Hygienic Requirements and Quality Control. Standards Publisher 1982.
19. The List of Maximum Permissible Concentrations (MPC) and Approximate Safe Impact Levels (ASIL) of Hazardous Substances for Fishery Water Bodies, 1990.
20. http://www.meteo.kz/page.php?page_id=17&lang=1
21. Order of the Minister of Health dated 20 October 2003 ref. 766 Concerning the Approval of the Rules of Mandatory Medical Examinations of Decreed Groups of Public registered with the State Registry for Regulatory Legal Documents under 2556.
22. Order of RK Minister of Health dated September 17, 2003 ref. 688 «On Approval of the Rules of Organization and Delivery of Hygienic Training for Decreed Group of Public» registered with the State Registry for Regulatory Legal Documents under 2531.
23. «The Sanitary-Epidemiological Requirements of Production, Quality and Safety of Bottled Drinking Mineral Natural and Artificially Mineralized Waters» as approved by Order of acting Minister of Health of 24 March 2005 ref. 147.
24. «The Instruction of Quality and Safety of Food Products» as approved by Governmental Decree dated 29 November 2000 ref. 1783.
25. Technical Regulations «Safety Requirements of Drinking Water for Public».
26. Technical Regulations «Safety Requirements of Bottled Drinking Water».
27. GOST 17.1.3.07-82 The Rules of Quality Control of Water Bodies and Water Courses. Standards Publisher 1982.
28. GOST 17.1.1.02-77. Nature Protection. Hydrosphere. Classification of Water Bodies. Standards Publisher 1977.
29. GOST 17.1.2.04-77 Nature Protection. Hydrosphere. Indicators of Conditions and the Rules of Taxation of Fishery Water Bodies. Standards Publisher 1977.
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31. ST RK ISO/IEC 17025-2007 General requirements for the competence of testing and calibration laboratories (IDT), Astana 2007.

32. ST RK ISO/IEC 65-2001 General requirement for bodies operating product certification systems. Astana, 2001.
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A. Jumagulov, A. Nikolayenko, I. Mirkhashimov

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