

The current state of Koyandy water reservoir and ways to improve its ecological state

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ABSTRACT

This paper contains discussion about current state of Koyandy reservoir and requests several ways to improve its ecological state.

Keywords: Koyandy water reservoir, ecological state of reservoir.

Kazakhstan has more than 4 thousand water reservoirs which's total area is 10 thousand km², 2 of them are very huge, 1 – huge, 6 – medium, and the rest are small; they has 90 thousand km² fresh water supply. Water reservoirs are used for national economy: water for everyday life, irrigation, and also for energetic, transport, recreational measures, sport and fishing purposes [1].

Koyandy water reservoir in located in Akmola region, Tselinograd district, along the river Koyandy, on the distance of 35 km from capital city Nur-Sultan.

Koyandy water reservoir was constructed in 1987 during Soviet government, though it was put into operation in 1989. The total used area of water reservoir is 5,16 mln.m³. The volume of water supply is 80%. Average and maximum length is 1,30/2,80 km. is. Average and maximum width is 1,10/2,0 km. is. The average and maximum depth is 3,22/16,80 meters. In general, water reservoir is made of local material, the maximum height is 19.50 meters. The reservoir works in limited mode.

The Koyandy reservoir's water level changes the for the whole year, and the level of water increases in the spring due to snow melts, and vice versa decreases from mid-summer till September.

The temperature mode of the reservoir: ice starts in the first half of November and will last until the end of April. High water temperature is observed at 19 ° C in July. The water supply is carried out at the expense of atmospheric precipitations and spring snow melting. The coast is clay, somewhere with stony rock. The ambience of the water level change varies from 0.5-1.1 meters depending on climatic features. The average depth of the reservoir is 3.0 m, the deepest point is up to 7 m. The water reservoir area is 410

hectares. The bottom of the water in some places is silted, the depth of silted deposits reaches 0.4-0.5 meters.

Water mineralization varies between 1.12-1.21 g/l. water Transparency varies from 0.4 to 2.7 meters and depends on weather conditions and water depth. The content of phosphorus, silicon and iron within the limits typical for surface unpolluted water bodies. The content of organic substances does not exceed the maximum permissible level of fishery water bodies. The reaction of medium is slightly alkaline, pH of 7.1 and 7.4. the content of basic chemicals at the standard level.

The rapid growth of the population of Astana and its territory, the dynamic development of the city's infrastructure today require sustainable provision of the necessary volume of quality drinking water.

Today, the main source of water in Astana is the reservoir Astana (former Vyacheslav), its remoteness from the city, as a result of which high water losses during water transportation require the search for nearby reservoirs. In this regard, Koyandy reservoir can be not only a source of water, but subject to development of fisheries, recreation, agriculture, and sports.

On the basis of officially published materials, the following ecological problems of the reservoir can be noted:

- siltation of the bottom;
- lack of constant monitoring of water level, peculiarities of its seasonal changes;
- rare monitoring of water quality, there is no information on monitoring Koyandy reservoir in the annual newsletter of the RSE "Kazgidromet" on the

state of the environment in the Republic of Kazakhstan;

- the locals use the water bodies for tourism purposes and for some kinds of sports. This leads to the ingress of various debris into the water, changing the habitat of aquatic plants and animals;

- in the settlements located near the reservoir, there is no centralized sewerage system, residents pour sewage into underground wells which have to be regularly cleaned. After cleaning of sewer wells by owners of some vehicles, there are some cases of discharge waste waters into water bodies;

To improve the ecological status of the reservoir, the following activities are recommended:

- monitoring of water quality, including bacteriological and chemical analysis of water, within the framework of state monitoring on the basis of RSE "Kazhydromet» ;

- strengthening the system of protection and safety of the reservoir in order to protect against unauthorized discharge of sewage, poaching from illegal fishing. Installation of the hunting service with vehicles and appropriate devices (boats, binoculars, special lights, etc.), allowing to engage in effective protective work, installation of an information board about the status of water.

In the conditions of intensive fishing the following reclamation works:

- aeration-enrichment of water with oxygen, which will not only enrich the reservoir with oxygen, but also restores the thermal balance of water, provides an equal distribution of temperature in the deep layers of water.

- clearing of aquatic vegetation- solid vegetation are wrapped manually or with cane machine and soft plants are purified by the special rake. Excessive increase in aquatic plants leads to the growth of the reservoir, that is, its transformation into a swamp;

- local dredging-in low-water areas, in winter prevent the mass death of fish under the influence of low temperatures. It is carried out with the help of an excavator by excavating deposits and soil on the shorelines.

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