

## Standard MPLNI as a new instrument for integral assessment of water body condition and determination of permissible external loads

R.K. Kaydarova, PhD in Chemistry, Kh.T. Supive, PhD in Chemistry

State-run Subsidiary Enterprise «State Scientific Production Association of Industrial Ecology  
«Kazmekhanobr»,  
67, Djandosov str., Almaty, 010036, Republic of Kazakhstan  
rkaidarova@mail.kz

In Kazakhstan, environmental (water) law reformation processes run in active mode, within which instead of the existing individual water quality specifications –  $MPC_{fish}$  and  $MPC_{san}$  – a new system of specifications has been developed, which can provide regulatory requirements of all categories of water use (fishery, drinking water supply, recreation, irrigation, industry, etc.). For practical testing and following introduction of that system to the water management and water protection areas in the Republic of Kazakhstan, a number of regulatory and methodological documents have been developed, which are currently in the approval and registration stages.

Instead of the existing for many years standard MPD (maximum permissible discharge), which regulates anthropogenic impact on the water body, we have worked out a standard MPLNI, the value of which is determined through the following equation:

$$M_{MPLNI} = [WQS \cdot (Q_{riv} + q_{sew}) - (Q_{riv} \cdot S_{riv})] \cdot 0.031,$$

where

- WQS - water quality standard value in the  $i^{th}$  pollutant according to the new classification (classes I-V); if the designed project is classified as a watercourse suitable for irrigation, then the value of class III is taken as WQS;
- $Q_{riv}$  - river flow rate in the control station according to data of the Kazakhstan Hydrometeorological Service,  $m^3/s$ ;
- $q_{cr}$  - total flow rate of the sewage inflowing into the river within the control watercourse or within the control water site,  $m^3/s$ ;
- $S_{pek}$  - actual concentration of pollutants in the control station of the water body at the design stage,  $g/m^3$ ;
- 0.031 - factor of conversion from g/s to t/year (dimensionless quantity).

When developing the new standard, the following definition was taken:

*MPLNI is maximum permissible limit of negative impacts of economic and/or other type of activities on the water body and its environmental conditions, under which the structure and normal functioning of the ecosystem is preserved and there is no harm to public health.*