Chapter 15
The Use of Storm Run-Off in Recirculating Systems of Water Supply at Industrial Enterprises

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ABSTRACT

Waste, thaw, and rain waters from the territory of industrial enterprises may pollute ground and surface waters, adjoining landscapes. This work presents the characteristics of their quality parameters and also suggests a number of measures permitting them to minimize their harmful impact upon environment. The purpose is the improvement of the technology of the reagent treatment of surface runoff from the territory of auto transport enterprises and of circulating waters for the repeated use by way of modernizing known methods via own original technological procedures and by chemical reagents. This work considers the comprehensive technology of collecting, treatment, and introduction into recycling of surface run-off for the auto transport enterprises, petrol stations.

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1. INTRODUCTION

Due to the climate change and increasing deficit of clean water, the question of economic use of water has become urgent. The same applies to the introduction of technologies facilitating repeated inclusion of circulating waters into technological processes.

Atmospheric (storm) run-offs from territories of enterprises are formed as a result of washing off admixtures accumulated on their territory of rain, thaw and irrigation water. The specific peculiarity of the storm run-off is its occasionally and distinctly expressed unevenness in discharge and concentration of pollutions. Storm run-offs from territories of industrial enterprises may contain specific admixtures peculiar for this or that production (Barbosa & Fernandes et al., 2012).

Depending on the composition of admixtures accumulated on industrial areas and washed off by the surface run-off, industrial enterprises and their separate territories may be divided into two groups as shown in Table 1. To the first group belong the enterprises of the ferrous metallurgy, machine building, coal, oil, light, bakery, milk producing, food industry, auto transport enterprises, and also separate productions of oil processing, oil chemical, chemical and other enterprises on the territory of which there are no specific polluting substances. To the second group belong the enterprises of non-ferrous metallurgy, coke chemical, microbiological industry and so on.

Table 1. Characteristics of rain run-offs by main indices of pollution

Indicators	Values of Indicators of Pollution of Rain Runoff, mg / dm^3	
	The First Group Enterprises	The Second Group Enterprises
Suspended particles (SP)	400–2000*	500–2000
Salt content	200–300	50–3000
Oil products (OP)	10–30 (70*)	Äî 500
COD filtered sample	100–150*	Äî 1400
BOD_{20} filtered sample	20–30*	Äî 400
Specific components	-	Depending on the production, they contain heavy metals, synthetic detergents, phenols, arsenic, fluorine, phosphorus, ammonia, fats, oils

High values for enterprises with the intensive transport traffic, the consumption of fuel-lubrication materials, auto transport enterprises, auto transport, washing installations, petrol stations (PS).

In thaw and rain waters from the territories of petrol stations (PS) the content of salts may exceed limiting admissible concentrations by 8-117 times; the content of OP may exceed admissible norms by 8.4-21.6 times (Kvartenko & Lysytsya et al., 2021).

Therefore, to protect surface and underground waters and also natural landscapes from pollutions contained in storm and waste waters of enterprises being in the infrastructure of the transport network it is expedient to foresee a number of measures (Kvartenko & Lysytsya et al., 2021):

- to use of purified rainwater to recharge circulating water supply systems;