EFFECTIVE ORGANIZATION OF WATER DRAINAGE SYSTEMS IN THE CITIES LOCATED ON THE SEASIDE AFFECTED BY THE GALE FORCE WAVES

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The issues of collecting-running, cleaning and flowing polluted surface water formed from the water collection areas through water drainage systems in the cities located on the seaside when they are affected by the gale force waves (to be conducted at both project and exploitation stages) according to mainrequirements of the city construction and sanitary-hygienic norms are reviewed.

Key words: ***gale force waves, cities located on the seaside, water drainage (sewage) system, polluted surface water inflow, complex of specific type floating wave softener hydro-engineering unitsremotely installed on the anchors from the surface.***

1. Introduction

Arrangement of the infrastructure of the cities located on the seaside being under the conditions of the gale force wave affect is significant engineering problem (to be implemented both at the project and exploitation stages). Respectively, it is necessary to effectively arrange the water drainage system in terms of collecting, running, cleaning and flowing polluted water formed from the water collection areas of the city into the sea. This exercise should be conducted maintaining the main requirements of city construction and sanitary-hygienic norms. Within this context the issue is very topical and its solution is very important for the seaside cities (Batumi, Poti, ect.) and not only for them.

2. Main Part

The issue is specific due to both relief of the cities and influence of the water inlets of the gale force waves on the collectors during the waves in the Black Sea. The gale force waves sometimes resist the streams flowing into the collectors delaying normal functioning of the water drainage system causing flooding of the cities, material loss, delays in transport functioning.

Flow of the surface water into the sea without cleaning it, if it exceeds the allowable limited level of the concentration inevitably causes "crisis ecological pollution" of water of the onshore water area of the adjacent coastal line. The mentioned pollution is basically caused by flooding of the streets and avenues and has high toxic substance content. The surface water inflow can be waste of oil products formed from exhaust fumes, surface active substances, iron and other toxic ingredients and weighted particles. Since the sea shores in the most cities are for swimming, health improvement purposes and of recreation importance (especially during hot tourist seasons), it is easy to imagine how big the threat of such pollution and negative influence on a human being's health is.

In order to provide normal functioning of the water drainage system during exploitation (which is the basic obligation of the city's water drainage (sewage) service), patrolling and preventative check of the water drainage system and its components for the purposes of periodically checking the working condition of the control wells, collectors and other network units is necessary. Respectively the sections of the identified wells and collectors

should be cleaned from the residues.

During exploitation the relief conditions of the city location create certain difficulties relating to the arrangement of the pumping stations. In such case, the water supplied through the pumping station may accumulate into the accumulators (for water reservation and mechanic cleaning purposes) and after certain delay may be flown into the sea. Also, it will be quite effective to install special type floating wave softener hydro-engineering unit complex onoffshore anchors in water collection sections remotely 80-100 m from the sea shore serving as a gale protection system [1]. The mentioned complex provides the inflow of the surface water in case of the gale force waves {1.2}. In designing the water sewage system of the city (or in deciding the rehabilitation-restoration tasks, the main requirements of the city construction and sanitary-hygienic norms should be taken into the account, in particular:

√ -in accordance with current requirements, surface water inflow formed from the city territories, should be cleaned before running into the reservoirs. Just the inflow from small areas (0,2 km areas and parks) can be run without cleaning based on the agreement with relevant environmental entities.

√ -it is recommended to use full separate drainage system in which case the first portion of water washed out of the streets, avenues, etc. runs to the cleaning station through the water separation cell (interceptor). Then, the excess charge of rather clean water is run to the reservoir. Such a system in complexity considers the operation regulations separately for drainage and technical and household networks and respectively cleaning station.

√ -it is recommended under the capital development and sanitary-hygienic requirements to arrange the closed drainage and sewage system.

Summary

Current issues relating to the effective organization of collecting-running, cleaning and flowing polluted surface water formed from the water collecting territories through the water drainage and sewage systems in the cities located on the seaside in case they are affected by the gale type waves (at both project and exploitation stages) in accordance with the main requirements of the city construction and sanitary-hygienic norms are discussed in the study.

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