

Assessment of groundwater oil contamination and the development of measures for its localization and liquidation (on the case study of the residential area within St. Petersburg, Russia)

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In 2015, in one of the residential areas in the south of St. Petersburg, there was an emergency regional-scale spill of oil products (motor oils, fuels and lubricants) onto the landscape and into the drainage ditches, which then penetrated to the surface water, including Neva river, and groundwater.

Difficult conditions of urban development, landscape features (former land-reclamation systems, former kitchen-gardens), and the basement of the building where the spill occurred, caused many problems with the assessment of the spill scale and determination of its contours.

This situation was aggravated by scarce filtration properties and high porosity of the host rocks, represented mainly by loams and clays.

As a result of the work at the first stage, the volumes and configuration of oil contamination were assessed, and its main migration routes were determined. Aquifer pumping tests were carried out in water wells, the core of rocks was studied, and groundwater and surface water monitoring program was developed and carried out.

At the second stage, a program for pumping tests of contaminated water was developed. The latest Russian filter technologies of the coalescent nanoporous filters “Cribrol” were used for groundwater purification from oil products.

As a result, the concentrations of oil products were reduced to values below the maximum admissible contents for wastewaters to allow the further water purification on local treatment plant.

The report will consider the geological setting and hydrogeological conditions of the site, the results of water and core analyses, the methodology of the study and liquidation of the oil contamination.

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