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Engineering geological zoning of the Central Federal region, Russian Federation, by the suitability for allocation of disposal sites and utilization facilities for solid municipal waste

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In the framework of implementing the combined projects for solid municipal waste (SMW) management, we have analyzed the degree of geoenvironment protection from contamination by the example of the Central Federal region of the Russian Federation. The main types of geological and hydrogeological structures have been distinguished and the criteria for assessing the degree of territory suitability for SMW management have been suggested.

The zoning scheme is based on the typification of soil and rock massifs developed by us at a small scale (1 : 2 500 000). As a result, the entire variety of ground massifs to a depth of about 50-60 m occurring in the Central Federal region were combined in 5 types according to their lithology, age, and the degree of water-saturation. Each type was subdivided into 4 subtypes depending on the composition and structure of Quaternary deposits.

The distinguished types of ground massifs were classified as favorable, conventionally favorable, conventionally unfavorable, unfavorable and very unfavorable as regards to SMW management project implementation. The qualitative assessment was performed proceeding from the geological structure in general, as well as the thickness and occurrence conditions of weak soils in the upper part of geological profile.

The compiled scheme gives us a general idea about the suitability of the proposed waste disposal sites at the initial stages of projecting engineering facilities; it permits outlining the possible key sites for further survey, and to designate necessary additional measures on the geoenvironment protection from the contamination upon the construction and operation of SMW engineering facilities. It is shown that for the most of the studied area, the construction and operation of SMW management facilities should be accompanied by the additional measures on the environment protection from contamination.

