

THE USE OF THE VERTICAL ELECTRICAL RESISTIVITY SOUNDING METHOD TO STUDY QUARRY DUMPS HETEROGENEITY

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Ecosystem changes caused by mining activities have a very significant scale. Substrates of quarry dumps have heterogeneous and mosaic character and therefore require accurate measurement of physical and chemical soil properties over large areas. The objectives of this study were to measure electrical resistivity of soils of the different quarry ecotypes and to assess the applicability of the vertical electrical soundings method in the conditions of transformed technogenic ecosystems. The measurements were performed using the portable device LandMapper-03 in four quarries located in the Leningrad and Novgorod regions. All the studied quarries had contrasting ecotypes. The main trends in the distribution of the soil electrical resistivity in the profiles were identified and interpreted. The depth of the parent rock occurrence, the presence of coarse materials, the heterogeneity of the soil profiles as well as depth of the layers with different particle size distribution were revealed using the vertical electrical soundings method. In general, the use of the method is promising for studying the spatial heterogeneity of the soils physical parameters. The study has shown that in some cases the resistivity values were abnormally high. That probably was caused by some specific characteristics of the new technogenic landscapes with common dumps and a large number of voids therein.

Key words: vertical electric sounding, quarry, soil reclamation.