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Risk to inland water based on agrogeological factors

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Modern agrogeology search not just on the surface, but also on the near-surface formations, and finally survey on the connections in the soil–parent rock–groundwater system for the prognosis of changes caused by human activity (harmful or advantageous consequences). The research of the geological reasons and the prognosis of inland water also belong to the tasks of agrogeology.

Risk to inland water depends on basically two geological factors: the water permeability of the near-surface formations and the depth of the groundwater under the surface. To establish the risk to inland water it is not enough to know one layer or one rock type, but also necessary to know how the upper 10 m of the sediments (or at least the layers as far as the level of the groundwater) are situated.

The first step of the task is to evaluate the searched area based on the relief, since the real risk to inland water appears just in the valleys, in the depressions and in the deeper parts of the plain areas.

The second task is to determine the average water permeability of the near-surface formations and to that the rock development of the upper 10 m of the formations from the surface was taken into consideration in Hungary. To find out the typical rock development types the loose sediment was divided into four categories based on the grain size: gravel (Ø>2 mm), sand (Ø=0,06-2 mm), coarse silt (Ø=0,02-0,06 mm), clay, which contains also the fine silt fraction, (Ø<0,02 mm). After that, further classification was completed based on that the superficial layer has a great thickness or it alternates with different layers. So in every case it is known that what type and layering sediment ensemble situates under a certain superficial sediment.

With this method 172 rock development types can be divided. These rock development types are typical of the landscape and it can be well represented on a map. During the grouping just the grain size of the sediments was taken into account and the different

genetic of the formations was not established.

Based on the different rock development, risk groups were created:

A1 risk group: superficial gravel layer with thickness greater than 4-6 m, or superficial gravel layer with thickness at least 2 m and under that sand layer with thickness at least 2 m.

A2 risk group: superficial sand layer with thickness greater than 4-6 m, or superficial sand layer with thickness at least 2 m and under that gravel layer with thickness at least 2 m.

B1 risk group: under the superficial gravel layer with thickness at least 2 m silt or clay.

B2 risk group: under the superficial sand layer with thickness at least 2 m silt or clay.

B3 risk group: superficial silt layer with thickness greater than 4-6 m, or superficial silt layer with thickness at least 2 m and under that sand or gravel.

C1 risk group: superficial clay layer with thickness at least 2 m.

C2 risk group: superficial silt layer with thickness at least 2 m and under that clay layer with thickness at least 2 m.

The third step of the task is to establish the typical level of the groundwater under the surface. Because the inland water is mostly caused or supported by the groundwater close to the surface, for the risk estimation the level of the groundwater was taken into consideration in the following depths: 0-1 m, 1-2 m and $>$2m.

Finally with the combination of the rock development categories and the level of the groundwater the risk of the inland water can be estimated on a certain area: the highest, high, medium, low and no risk. The result can be represented on the risk to inland water map about the searched area.