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KARST AQUIFER OF THE TRNOVO-BANJŠICE PLATEAU

Hydrogeological characteristics of the area

In the Goriška statistical region, the karst aquifer of the Trnovo-Banjšice plateau is the most important reservoir of drinking water. In numerous hydrogeological researches of this area the project partners and contractors were involved (geomorphological and speleological researches, geological and hydrogeological mapping, hydrochemical and isotopic analyses, tracer tests, etc.). The data gathered and obtained new knowledge about the characteristics of studied water sources make a solid expert basis of the GEP project. By a proper use of new methods this knowledge can be efficiently applied in the planning of water protection measures and especially for implementation of proper actions in the cases of extreme events.

The Trnovo-Banjšice plateau forms together with the Nanos plateau the so called High Dinaric karst, which is bordered by the valleys of the Soča, Idrijca, Vipava and Pivka Rivers and their tributaries. The belt of carbonate rocks is 10 to 15 km wide, approximately 50 km long, and has an area of approximately 700 m^2. Deep karstified Cretaceous (marked with green colour on Figure 1) and Jurassic (blue colour) limestone and Triassic (pink colour) dolomites prevail. Toward north-west they sink below younger, mostly Eocene (yellow-brownish colour) flysch rocks. Flysch surrounds karstified limestone at southern and eastern side too, and acts as a hydrogeological barrier. At the northern side the karst aquifer is bordered by mostly impermeable Middle and Lower Triassic, and partly also Permian and Carboniferous rocks, in which the valleys of the Belca, Idrijca, Zala, and Trebuša Rivers are cut (Janež et al. 1997).

For this high plateau with the altitudes of around 1500 m, a transition between mediterranean and alpine climate is characteristic. Annual precipitation can exceed 3000 mm, and mean annual temperature ranges between 7 and 9°C. During high and long winters the snow is abundant, and the snow cover can last for several months. A large part of the area is covered by forest.

Through the karstified surface of the Trnovo-Banjšice plateau the precipitation infiltrates deep into the karst aquifer, which stores large quantities of groundwater, and is discharged through big karst springs at the edge of the plateau (Figure 2). Many of these springs (e.g. Mrzlek, Hubelj and Kajža springs) are captured for the water supply.

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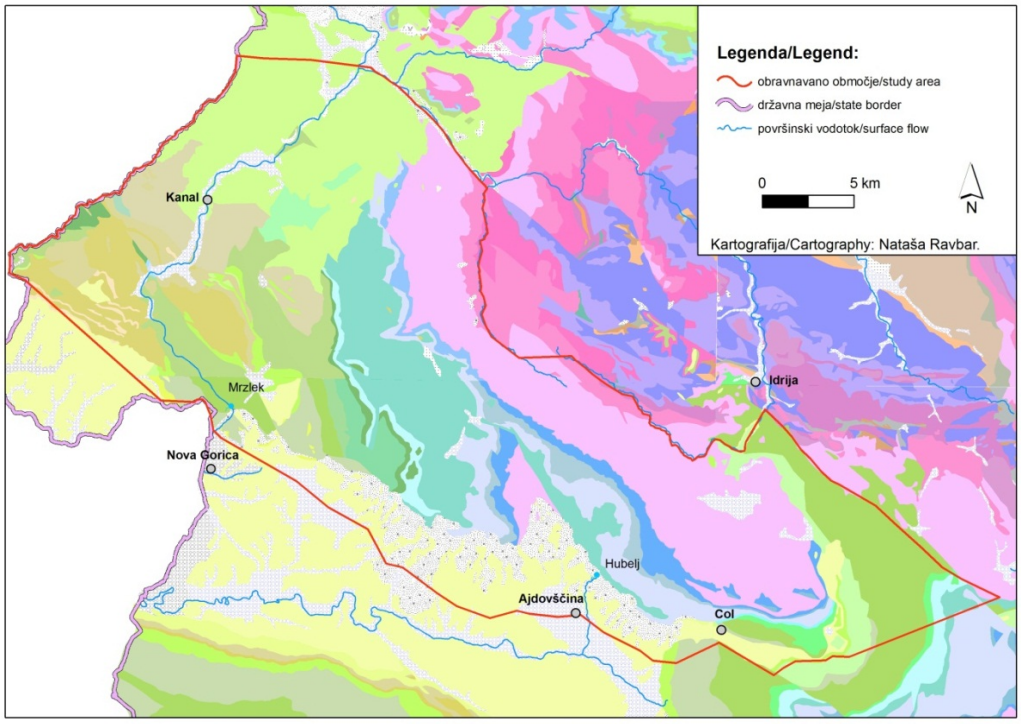

Figure 1: Geological map of the Trnovo-Banjšice plateau with marked border of the study area which will be incorporated in the karst hydrogeological model (source of geological data: Basic geological map - Osnovna geološka karta 1:100.000)

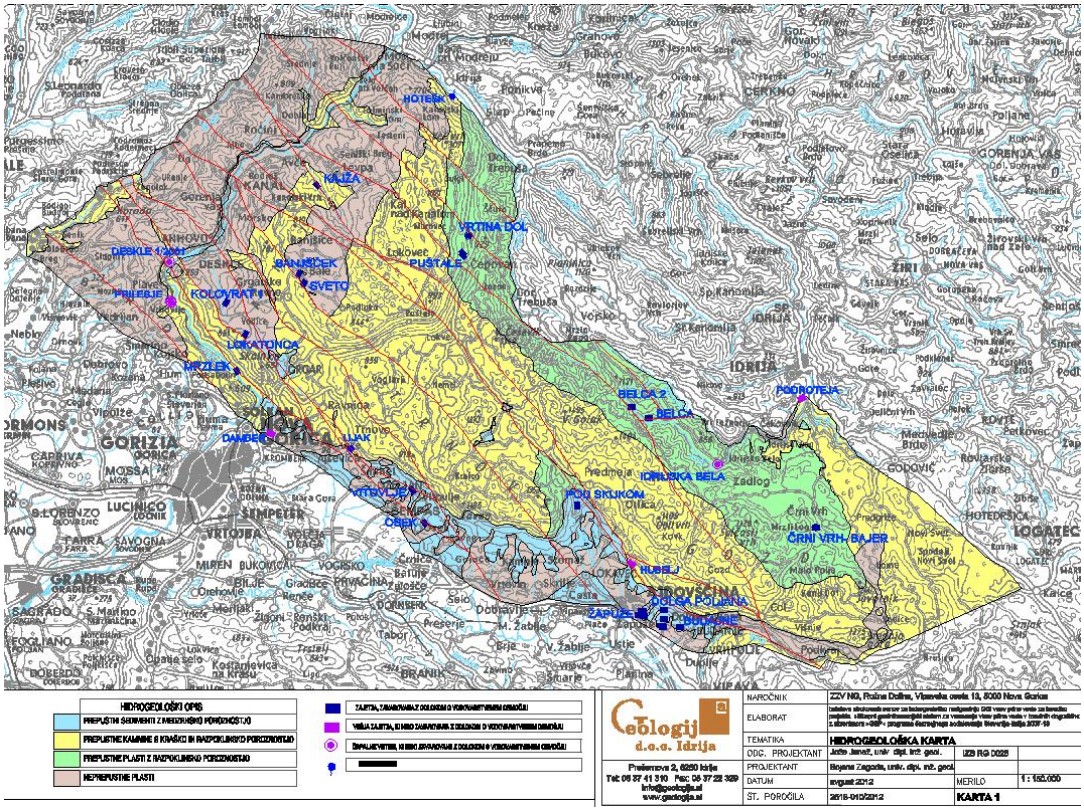

Figure 2: Map of the study area with marked different hydrogeological types of rocks (karst-fissured aquifer in yellow-brownish colour, fissured aquifer in green, intergranular aquifer in blue, and very low permeable rocks in brown) and the most important water sources.

References

Batič, J. (ur.), 1996: Divje jezero pri Idriji. Kulturni in naravni spomeniki Slovenije.- Zbirka vodnikov, 188, 72 str., Ljubljana.

Čar, J., Gospodarič, R., 1989: Geološka zgradba in nekatere hidrološke značilnosti bruhalnika Lijaka.- Acta carsologica, 17, 13-32, Ljubljana.

Habič, P., 1968: Kraški svet med Idrijco in Vipavo. Prispevek k poznavanju kraškega reliefa.- SAZU, Classis IV, Dela-Opera 21, 243 str., Ljubljana.

Habič, P., 1982: Kraški izvir Mrzlek, njegovo zaledje in varovalno območje.- Acta carsologica, 10, 45-73, Ljubljana.

Habič, P., 1987: Sledenje na kraškem razvodju med Idrijco, Vipavo in Ljubljanico.- Acta carsologica, 16, 105-118, Ljubljana.

Janež, J., Čar, J., 1990: Kraški izvir Kajža in njegovo zaledje.- Acta carsologica, 19, 101-138, Ljubljana.

Janež, J., Čar, J., Habič, P., Podobnik, R., 1997: Vodno bogastvo visokega krasa. Ranljivost kraške podzemne vode Banjšic, Trnovskega gozda, Nanosa in Hrušice.- Geologija d.o.o., 167 str., Idrija.

Janež, J., 1992: Hidrološke značilnosti kraškega bruhalnika Lijaka.- Rudarsko-metalurški zbornik, 39/1-2, 181-192, Ljubljana.

Kranjc, A. (ur.), 1997: Karst Hydrogeological Investigations in South-Western Slovenia.- Acta carsologica, 26/1, 388 str., Ljubljana.

Petrič, M., 1993: Hidrodinamični režim kraškega vodonosnika med solkansko akumulacijo in bruhalnikom Lijakom.- Acta Carsologica, 22, 179-200, Ljubljana.

Placer, L., 1981: Geološka zgradba jugozahodne Slovenije.- Geologija, 24/1, 28-60, Ljubljana.

Placer, L., Čar, J., 1974: Problem podzemeljske razvodnice Trnovskega gozda, Križne gore in Črnovrške planote.- Acta carsologica, 6, 81-93, Ljubljana.

Ravbar, N. 2007: The protection of karst waters, a comprehensive Slovene approach to vulnerability and contamination risk mapping. Založba ZRC, 254 str., Ljubljana.

Trček, B., 2003: Epikarst zone and the karst aquifer behaviour: a case study of the Hubelj catchment, Slovenia.- Geološki zavod Slovenije, 100 str., Ljubljana.

Trček, B., Veselič, M., Pezdič, J., 2003: The vulnerability of karst springs – a case study of the Hubelj spring (SW Slovenia).- Rudarsko-metalurški zbornik, 50/1, 385-388, Ljubljana.