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Podzemne vode arteskkih i subarteskkih horizonata kao alternative za vodosnabdevanje seoskih naselja opštine Aleksinac

Vodosnabdevanje grada Aleksinca i devetnaest naselja vrši se iz centralizovanog vodovoda, sa akumulacije Bovan. Manji broj seoskih naselja ima autonomne vodovode koji se vodom snabdevaju preko bunara i kaptiranih izvora, dok trinaest sela nemaju nikakvu vodovodnu infrastrukturu i prinuđena su da se oslone na individualno vodosnabdevanje.

Hydrohemijiska svojstva arteskkih i subarteskkih bunara na teritoriji opštine Aleksinac, kao i voda iz površinske akumulacije Bovan ispitivana su osnovnim hidrogeološkim i hidrohemijiskim metodama. Uzorkovanje vode vršeno je početkom avgusta 2014. godine na šest lokacija, i uzeti su uzorci sirove i prerađene vode iz akumulacije Bovan. Pored osnovnog hemijskog sastava uzorkovanih voda određene su i koncentracije pojedinih teških metala, kao i mikrobiološka analiza uzoraka. Rezultati pokazuju da su sve uzorkovane vode bikarbonatno-natrijumske, ali se njihova mineralizacija razlikuje. Vode iz akumulacije Bovan su malomineralizovane vode, veoma nestabilne po pitanju kvaliteta i podložne su zagađenju. Sirova voda se ne može koristiti za vodosnabdevanje bez prethodnog tretmana zbog mikrobiološke neispravnosti, kako i povišenih koncentracija jona Fe^{2+} i Mn^{2+} i povišenog utroška $KMnO_4$ (povećanog prisustva organske materije). Tri uzorka arteskkih voda spadaju u mineralizovane vode, i u njima je konstatovano prisustvo slobodnog gasa H_2S , i elektroprovodljivost iznad $1000 \mu S/cm$, kao i alkalni pH. Ove vode zbog svog sastava ne mogu se koristiti za piće, i potrebno je njihovo dalje ispitivanje da bi se utvrdila mogućnost njihovog korišćenja u balneo-terapijske svrhe. Za razliku od njih, ali i od voda iz akumulacije Bovan, uzorci sa druga tri bunara odgovaraju standardima vode za piće. One nisu opterećene zagađivačima i mogu se koristiti za vodosnabdevanje bez ikakvog prethodnog tretmana.

Preporuka je ulagati u dodatna istraživanja podzemnih voda, jer bi se na taj način obezbedile dodatne količine voda pogodnih za piće, koje se mogu koristiti u naseljima gde vodosnabdevanje nije rešeno.

Groundwaters of Arthesian and Subarthesian Horizons as Alternatives for Water Supply of Villages in the Municipality of Aleksinac

The research area is located in eastern Serbia and belongs to the municipality of Aleksinac. The city of Aleksinac and nineteen villages are supplied with water from the central water supply system, from the accumulation of Bovan. Only a small number of villages have an autonomous water supply which gets its water from wells and tapped sources, while thirteen villages do not have any water supply infrastructure and need to rely on individual water supply.

Hydrochemical properties of artesian and subartesian wells on the municipal territory of Aleksinac, as well as water from the surface accumulation of Bovan were examined using basic hydrogeological and hydrochemical methods. Water sampling was done in the beginning of August 2014 on six locations, and samples of crude and processed water were taken from the accumulation of Bovan. On top of determining the basic chemical composition of sampled waters and concentration of certain heavy metals, microbiological analysis were also done. Results show that all water samples have bicarbonate-sodium character, but their mineralization differs. Waters from the accumulation of Bovan are lightly mineralized, very unstable in means of quality and are susceptible to pollution. Crude water can not be used for water supply without

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prior treatment because of microbiological irregularity, as well as higher number of Fe and Mn ions and higher consumption of KMnO_4 . Three samples of artesian waters belong to mineralized waters and the presence of H_2S gas, conductivity above $1000 \mu\text{S}/\text{cm}$, and alkaline pH were determined. These waters, because of their composition, can not be used for drinking. Further research is needed so that the possibility of their balneo-therapeutic usage could be determined. In contrast to them, and to waters from the accu-

mulation of Bovan, the other three samples correspond to the standards of drinking water. They are not loaded with pollutants and can be used for water supply without any prior treatment.

It is recommended to invest in additional research of underground waters on the municipal territory of Aleksinac, because, this way, additional quantities of water suitable for drinking could be provided, and could be distributed to villages which do not have a water supply of their own.