Dissolved mercury in Funil reservoir, RJ, Brazil

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Introduction

Diffuse emissions of several contaminants are linked to water and energy, as the need for these leads to modification of frequency, magnitude and nature of the contribution of water and sediments, mainly due to interventions in the drainage basinsuch as the reservoirs formation. Among these contaminants is mercury (Hg), which offers known health risk [1]. Therefore, this study evaluated the effect of the Funil dam, located in Resende, RJ, SE Brazil, in the level of Hg dissolved in water at three points of the Paraíba do Sul River (RPS) during 1 year.

Results

Sample	ago/10	set/10	out/10	nov/10	dez/10
Upstream	1,38	0,15	0,13	1,60	1,65
Reservoir	0,59	0,08	<0,05	4,58	0,23
Downstream	0,87	0,11	0,16	3,28	1,61
Sample	fev/11	mar/11	abr/11	jun/11	jul/11
Upstream	5,00	2,70	10,12	2,49	1,16
Reservoir	3,02	4,55	4,92	1,11	26,42
Downstream	9,44	1,87	2,64	3,12	0,98

Figure 1: Hg concentrations in Paraiba do Sul river (ng.L^{-1}).

Samples showed concentrations below the maximum allowed by law [2]. Although the basin RPS has compromised quality of water in several parts, this region does not suffer significant contamination by the element studied.

[1] WORLD HEALTH ORGANIZATION. *Environmental Health Criteria - mercury*. Geneva: WHO, 1992. [2] BRASIL. (CONAMA). *Resolução n. 357*. 17 de março de 2005.

Hydrogeochemical characteristics of water source in the area of Lazarevo village (from the aspect of balneology)

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Geological data obtained from boreholes for oil and gas were used for geological mapping of "Jaša Tomić" sheet 1:100.000, in the area of Pannonian basin represents a special geothermal province (M. Milivojević, 1989) and one complex hydrogeothermal conductive system with four mutually separated reservoirs of underground water. A first hydrogeological system includes Upper Pontian sediments about 2 km thick in Northern Banat and a few tenths of meters in peripheral parts of the basin. In deeper parts clayey-marly sand prevail. In shallower parts larger parts presence of sandy-pebbly sediments of lacustrine and river origin are dominant. Sand water-bearing sediments parts presence vary from 1 to 50 m in thickness. The source of mineral water is located nearby structural boreholes Lazarevo (La-1), Topolovac (Tc-1) and borehole for water supply of village Lazarevo.

HCO$_3$	SO$_4$	Cl	Na	K	Mg	Ca	Br
569	3655	2744	3076	273	286	118	20
1464	2120	459	1740	1	101	69	5

Table 1: Physical-chemical composition (mg/l) of mineral water in Lazarevo (well) – First raw –data from 1957; second raw – data from 2012

According to results of laboratory researches (2012) water is medium mineralized low alkaline subthermal, Na-Mg-Ca, SO$_4$-HCO$_3$-Cl which classifies it as low alkaline saline bitter water. Water which was analysed in the period of 1957 belongs to medium mineralized low alkaline type of water, Na-Mg-Ca, SO$_4$-Cl-HCO$_3$ which classifies it as saline-muriatic-bromine-bitter water which is very healing. Variations in chemical composition are obvious, and they depend on the regime of underground water and aquifer type. Reserarches related to this are planned in the following period.