Environmental Engineering and Management Journal November/December 2009, Vol. 8, No.6, 1541-1551
http://omicron.ch.tuiasi.ro/EEMJ/

"Gheorghe Asachi" Technical University of Iasi, Romania

ASSESSMENT OF HEAVY METAL CONTAMINATION AND IMPACT ON SURFACE WATERS IN IAŞI CITY, ROMANIA

Corneliu Horaicu[*1], Florea Cornel Gabrian[2], Irina Grozavu[1], Cătălin Constantin Calu[1], Monica Horaicu[3], Brindusa Robu[4]

[1]*„Alexandru Ioan Cuza" University of Iaşi, Blvd.Carol I 20A, 700505, Iaşi, Romania*
[2]*Ministry of Economy, 36-38 Mendeleev Str., 010366, Bucharest, Romania*
[3]*S.C. Arcadis TGH S.R.L., 4 Carol I Blvd., 700506, Iaşi, Romania*
[4]*"Gheorghe Asachi" Technical University of Iasi, 71 A Dimitrie Mangeron Blvd., 700050, Iasi, Romania*

Abstract

The paper makes qualitative and quantitative analyses of heavy metal contamination of surface waters in Iaşi City. The examination of data acquisited from the specific sections of the rivers Bahlui (upstream section, Iaşi water treatment plant, Holboca section, downstream section, Iaşi water treatment station), Nicolina (quarterly data from the established monitoring system) was performed, based on data provided by the Environmental Protection Agency of Iaşi District and Prut Water Department from Iaşi. A similar analysis was performed for Chirița and Ciric water accumulations. The following heavy metal species were analyzed: Total Iron (FeII), Lead (PbII), Nickel (NiII), Chrome (CrVI), Cadmium (CdII), Copper (CuII) and Zinc (ZnII). In addition, the quantification of the impact induced by heavy metals on the surface waters in Iaşi city was carried out, based on the determined values of the global contamination parameter, according to Rojanschi method. The impact analysis showed that a significant contamination with Fe(II) for Bahlui River exists for the time interval 2001-2003, as well as with Pb during 2001-2002. This signifies that the environment shows the evidences of a certain discomfort degree for living forms generated by the human activity, but within allowable limits. For Nicolina River, the global contamination parameter for Ni(II) evaluated for the time interval 2003-2005 indicates that the river contamination due to the human activity is also within the permissible limits. The Chirița Accumulation suffered a significant contamination during 2003-2004, related to total iron Fe(II) levels, which began to improve since 2005. A similar result has been obtained for the Ciric accumulations, as well. Since these results were obtained for time intervals when economic activities were stagnant, it is considered that the monitoring process is still necessary.

Key words: contaminations, heavy metals, Iaşi city, impact

[*] Author to whom all correspondence should be addressed: e-mail: choraicu@yahoo.com;