

UNIVERSITY
OF EAST
SARAJEVO



FACULTY OF
TECHNOLOGY
ZVORNIK



INTERNATIONAL CONGRESS

ENGINEERING, ENVIRONMENT
AND MATERIALS IN
PROCESSING INDUSTRY

PROCEEDINGS



JAHORINA
15th - 17th March 2017

REPUBLIC OF SRPSKA
BOSNIA AND HERZEGOVINA

www.tfzv.org

FACULTY OF
TECHNOLOGY ZVORNIK
SUPPORTED BY:

UNION OF ENGINEERS AND
TECHNICIANS OF SERBIA
Belgrade, Serbia

FACULTY OF TECHNOLOGY,
UNIVERSITY OF ŠTIP
Republic of Macedonia

FACULTY OF TECHNOLOGY,
AND METALLURGY, SKOPJE
Republic of Macedonia

**UNIVERSITY OF EAST SARAJEVO
FACULTY OF TECHNOLOGY ZVORNIK**



PROCEEDINGS

V INTERNATIONAL CONGRESS

**„ENGINEERING, ENVIRONMENT AND MATERIALS IN
PROCESSING INDUSTRY“**

**UNDER AUSPICES OF
*THE MINISTRY OF SCIENCE AND TECHNOLOGY OF REPUBLIC OF SRPSKA
THE ACADEMY OF SCIENCE AND ART OF REPUBLIC OF SRPSKA***

**JAHORINA, March 15th-17th 2017
REPUBLIC OF SRPSKA
BOSNIA AND HERZEGOVINA**

PUBLISHER

FACULTY OF TECHNOLOGY

Karakaj 34a, 75 400 Zvornik

Republika Srpska, BiH

Telefon: +387 56 26 10 72

Fax: +387 56 26 01 90

e-mail: sekretar@tfzv.org

web: www.kongres.tfzv.org

FOR PUBLISHER:

Ph.D. Miladin Gligorić, dean

ORGANIZING COMMITTEE/ORGANIZACIONI ODBOR:

Ph.D. Miladin Gligorić, president, Ph.D. Aleksandar Došić, secretary, Ph.D. Milovan Jotanović, Ph.D. Miomir Pavlović, Ph.D. Radoslav Grujić, Ph.D. Dragica Lazić, Ph.D. Goran Tadić, Ph.D. Milorad Tomić, Ph.D. Mitar Perušić, Ph.D. Ljubica Vasiljević, Ph.D. Vaso Novaković, Ph.D. Dragan Vujadinović, Dipl. ing. Novo Škrebić, M.Sc. Mirjana Beribaka, M.Sc. Danijela Rajić, M.Sc. Marija Ridošić, M.Sc. Stefan Pavlović

SCIENTIFIC AND PROGRAMME COMMITTEE:

Ph.D. Todor Vasiljević, **Australia**, Ph.D. Ivan Krostev, **Bulgaria**, Ph.D. Milovan Jotanović, **Bosnia and Herzegovina**, Ph.D. Miomir Pavlović, **Bosnia and Herzegovina**, Ph.D. Miladin Gligorić, **Bosnia and Herzegovina**, Ph.D. Jovan Đuković, **Bosnia and Herzegovina**, Ph.D. Radoslav Grujić, **Bosnia and Herzegovina**, Ph.D. Dragan Tošković, **Bosnia and Herzegovina**, Ph.D. Dragica Lazić, **Bosnia and Herzegovina**, Ph.D. Živan Živković, **Bosnia and Herzegovina**, Academician Dragoljub Mirjanić, **Bosnia and Herzegovina**, Ph.D. Siniša Moljević, **Bosnia and Herzegovina**, Ph.D. Ljiljana Vukić, **Bosnia and Herzegovina**, Ph.D. Jasmin Komić, **Bosnia and Herzegovina**, Ph.D. Dane Malešević, **Bosnia and Herzegovina**, Ph.D. Midhat Suljkanović, **Bosnia and Herzegovina**, Ph.D. Mira Vukčević, **Crna Gora**, Ph.D. Darko Vuksanović, **Crna Gora**, Ph.D. ing. Srećko Stopić, **Germany**, Ph.D. Milan Sak-Bosnar, **Croatia**, Ph.D. Gyula Vatai, **Madarska**, Ph.D. Svetozar Hadži Jordanov, **Macedonia**, Ph.D. Kiril Lisičkov, **Macedonia**, Ph.D. Vineta Srebrenkoska, **Macedonia**, Ph.D. Jurij Kropce, **Slovenia**, Ph.D. Andrzej Kowal, **Poland**, Ph.D. Magdalena Parlinska-Wojtan, **Poland**, Ph.D. Časlav Lačnjevac, **Serbia**, Ph.D. Milan Antonijević, **Serbia**, Ph.D. Đorđe Janačković, **Serbia**, Ph.D. Branko Bugarški, **Serbia**, Ph.D. Ivan Juranić, **Serbia**, Ph.D. Božo Dalmacija, **Serbia**, Ph.D. Sonja Đilas, **Serbia**, Ph.D. Đorđe Okanović, **Serbia**

EDITORIAL BOARD:

Ph.D. Miladin Gligorić

Ph.D. Aleksandar Došić

Ph.D. Dragan Vujadinović

TECHNICAL EDITORS:

M.Sc. Mirjana Beribaka, M.Sc. Danijela Rajić, M.Sc. Marija Ridošić, M.Sc. Stefan Pavlović

AREA:

ENGINEERING, ENVIRONMENT AND MATERIALS IN PROCESSING INDUSTRY

PUBLISHED: 2017.

PRINT: Eurografika Zvornik

CIRCULATION: 200 copies

ISBN: 978-99955-81-22-0

The authors have full responsibility for the originality and content of their own papers

SOIL RISK ASSESSMENT OF HEAVY METAL CONTAMINATION IN URBAN AREA: BELGRADE, SERBIA

Dević Gordana¹, Bulatović Sandra², Ilić Mila¹, Miletić Srdjan¹, Milić
Jelena¹, Avdalović Jelena¹, Vrvic M. Miroslav²

¹Department of Chemistry, IChTM, University of Belgrade, Studentski trg
12, 11158 Belgrade, Serbia

e-mail: gdevic@chem.bg.ac.rs

²University of Belgrade, Faculty of Chemistry, Studentski trg 12, 11158
Belgrade, Serbia

Abstract

The present study is focused on the investigation of urban soil pollution in the area of thermal plant New Belgrade within neighborhood of more than 200.000 residents. Soil samples were collected in 2015, and ten heavy metals, including Fe, Mn, Co, Cd, Cr, Cu, Pb, Ni, Zn and V were analyzed for their concentrations, potential environmental risks, and human health risks. The aim was to investigate the spatial distribution of heavy elements, to evaluate the soil contamination degree and to improve their monitoring in analyzed area and to assess the human health risk for the sensitive population. Analysis of metals was carried out using the atomic emission spectrometer with inductively coupled plasma, after triacid total digestion (HCl, HNO₃ and HF) [1].

The results demonstrate a general enrichment of Zn, Pb and Cd in the topsoils, so direct risk for humans could be expected. The highest metal concentrations Cr, Ni and V were found at a soil depth of 2-15m, from boreoles Z-1, Z-7 and Z-13. Using target values given by the Netherlands Ministry of Housing, Spatial Planning and Environment, it may be concluded that Belgrade soil can, for the most part, be regarded as polluted. Traffic seems to be one of the main sources of these metals, but the influence of other factors cannot be excluded such as accidental spillage from reservoirs over the years.

Keywords: *Urban soil, Heavy metals, Contamination, Human and environmental risks*

Reference:

[1] Devic, G., Djordjevic, D., Sakan, S. (2014). Natural and anthropogenic factors affecting the groundwater quality in Serbia. *Science of the Total*

V medunarodni kongres "Inženjerstvo, ekologija i materijali u procesnoj industriji"
V International Congress "Engineering, Environment and Materials in Processing Industry"
Environment, 468–469, 933–942.

CIP - Каталогизacija y publikaciji
Nародна и универзитетска библиотека
Републике Српске, Бања Лука

66.02-9(082)(0.034.2)
54(082)(0.034.2)
502/504(082)(0.034.2)

INTERNATIONAL Congress "Engineering, Ecology and Materials
in the Processing Industry" (5 ; 2017 ; Jahorina)
Proceedings [Електронски извор] / V International Congress
"Engineering, Ecology and Materials in the Processing Industry",
Jahorina, March 15th-17th 2017 ; [editorial board Miladin Gligorić,
Aleksandar Došić, Dragan Vujadinović]. - Zvornik : Faculty of
Technology = Tehnološki fakultet, 2017 (Zvornik : Eurografika). - 1
elektronski optički disk (CD-ROM) : tekst, ilustr. ; 12 cm

Sistemska zahteva nisu navedeni. - Nasl. sa naslovnog ekrana. - Tiraž
200. - Bibliografija uz sve radove. - Abstract. - Registar.

ISBN 978-99955-81-22-0
1. Faculty of Technology (Zvornik)

COBISS.RS-ID 6384408



UNIVERSITY
OF EAST
SARAJEVO



FACULTY OF
TECHNOLOGY
ZVORNIK

www.tfzv.org

