

PL ISSN 0324-8828
INDEX 357200

321

environment protection engineering

72.9

1/2002



EDITORIAL BOARD

Guy ALAERTS, Antwerp, Belgium

Brian BOLTO, Clayton, Vic., Australia

Irina CECH, Houston, Texas, U.S.A.

Eva CHMIELEWSKÁ, Bratislava, Slovakia

Jan DOJLIDO, Warszawa, Poland

Marek GROMIEC, Warszawa, Poland

Jan JUDA, Warszawa, Poland

Piotr KABSCH, Wrocław, Poland

Edward KEMPA, Zielona Góra, Poland

Apolinary L. KOWAL, Wrocław, Poland

Jerzy KURBIEL, Kraków, Poland

William I. LACY, Alexandria, Virginia, U.S.A.

Alicja M. MIKA, Hamilton, Canada

Maria PAWLACZYK-SZPILOWA, Wrocław, Poland

Marek ROMAN, Warszawa, Poland

Jan D. RUTKOWSKI, Wrocław, Poland

Vladimir S. SOLDATOV, Minsk, Belorussia

Tomasz WINNICKI, Wrocław, Poland

Jerzy ZWOŹDZIAK, Wrocław, Poland

1/2002

**environment
protection
engineering**



published quarterly

Wrocław 2002

The journal is supported by the State Committee for Scientific Research
and Provincial Fund for Environment Protection and Water Management

Editor-in-Chief

Tomasz WINNICKI

Editors

Jerzy ZWOŹDZIAK, Lucjan PAWŁOWSKI

Assistant Editor

Katarzyna MAJEWSKA-NOWAK

Editorial Layout and Proof-Reading

Ewa SOBESTO

Editorial Office

Faculty of Environment Engineering
Wrocław University of Technology
Wybrzeże Wyspiańskiego 27, 50-370 Wrocław, Poland

Publisher

Wrocław University of Technology, Wybrzeże Wyspiańskiego 27, 50-370 Wrocław
Wrocław University of Technology Press, Wrocław, Wybrzeże Wyspiańskiego 27

© Copyrigth by Oficyna Wydawnicza Politechniki Wrocławskiej, Wrocław 2002

PREFACE

These proceedings comprise a selection of 14 manuscripts originally presented as papers at the 2-nd Conference *Progress in Environmental Engineering* held in Polańczyk, Poland, September 20–22, 2001. It aimed at being a step forward compared to the first conference held in 1999. Some new ideas and research methods have been developed since then. Our objective was to bring together scientists and practising engineers, who were given an opportunity to express their views and discuss physical, chemical and biological processes and interactions between various components of ecosystems as well as various components of wastewater and waste systems.

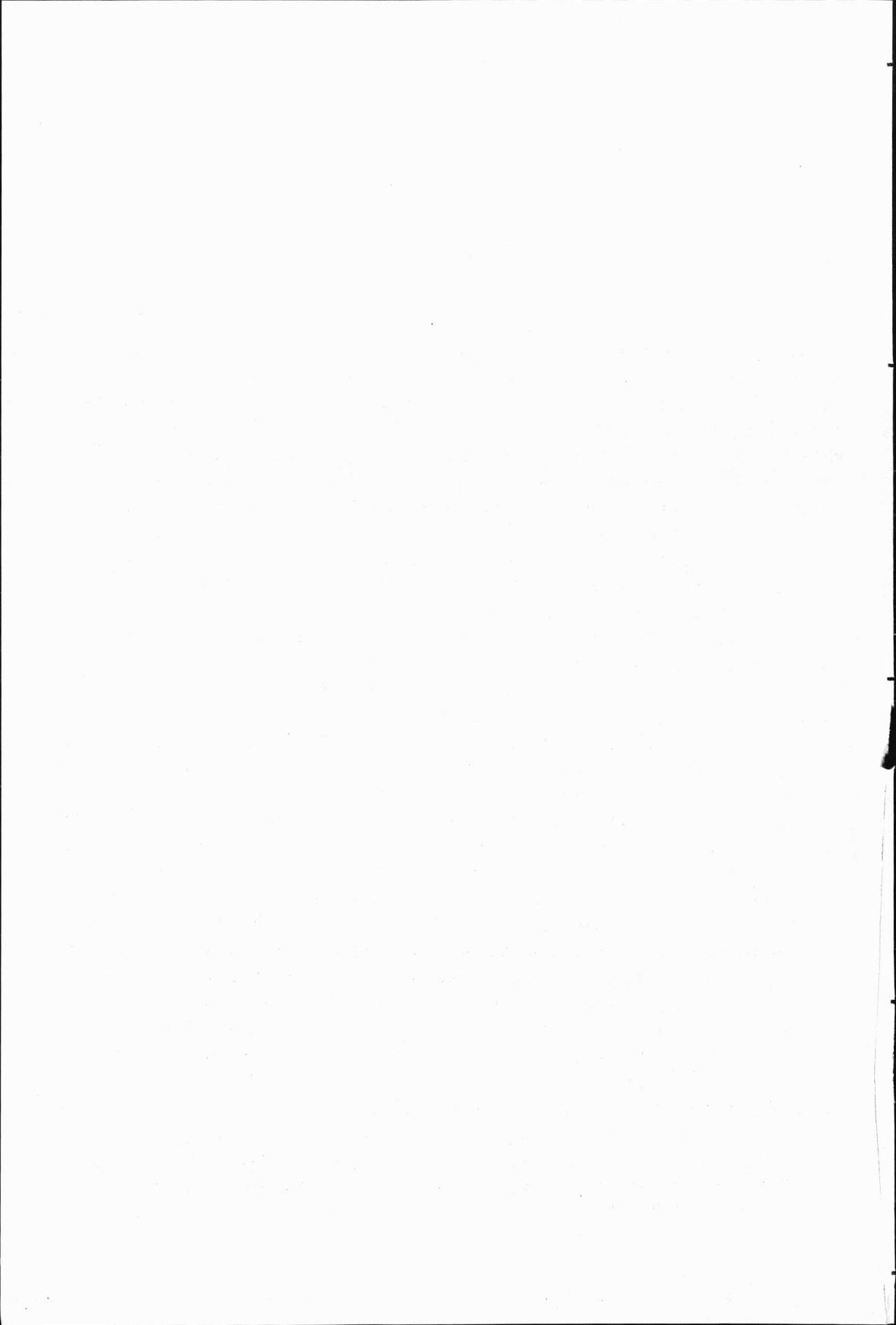
The conference was attended by some 70 delegates. A total of 31 brief lectures were presented, including 2 keynote lectures. A small exhibition was arranged as part of the conference, where the representatives of the companies providing sensors and developing industrial control solutions to the water and wastewater contamination control presented their products. In the programme of the conference, study tours were included.

I am grateful to a number of people who devoted their time and effort to organize the conference. Being a chairman, I was given a rare privilege to co-operate with such knowledgeable, brilliant and outstanding colleagues as Witold Niemiec, Ewa Czerwieniec and Maria Grabas, Department of Environmental and Chemistry Engineering, Rzeszów University of Technology. They were deeply involved in preparing the programme, keeping the web site up-to date, organizing the review process and editing the proceedings. I would like to acknowledge the Solina Commune in Polańczyk, the Environmental Protection Division, Voivodeship Office, Rzeszów, the Hydrobudowa Rzeszów – the sponsors and exhibitors, who provided financial support. I would like to address special thanks to the Fund for Environmental Protection and Water Management, Rzeszów, the main sponsor of this journal issue. I also sincerely appreciate the reviewers, who guaranteed a high quality of the programme. First they selected the papers for the conference, and then they reviewed those being published in this issue of *Environment Protection Engineering*.

I would like to thank all participants of the conference, especially those who presented their papers. Their generous contribution to knowledge makes the progress in protection of environment.

I will be pleased to see you in Polańczyk in 2003.

Janusz A. Tomaszek
Chairman



CONTENTS

W. NIEMIEC, W. SZYMBORSKI, Monitoring the effect of the municipal waste dump in Krynica on environment	7
R. WIŚNIEWSKI, Attempts to eliminate cyanobacterial blooms in Lake Łasińskie	15
B. MOŃKA, M. ŁUCARZ, D. IZBIAŃSKA, Progress in sewage treatment technology accomplished by the Regional Water Management Authority (RWMA) in Wrocław	27
M. WARDAS, M. PAWLIKOWSKI, A. KORZENIAK, A. BASIŃSKA, R. SZOTA, M. KŁĘK, Heavy metals in sediments of water and wastewater system in Cracow	35
L. GUTOWSKA-SIWIEC, M. ŚLESICKI, Mathematical modelling of contaminant flow and transport in ground waters	43
M. STRZELCZYK, T. KAMIZELA, L. WOLNY, Determination of permanent, electromagnetic field influence on sewage sludges conditioning	49
W. NIEMIEC, T. JASIŃSKI, A. PIECH, Examination of nitrate concentration in ground water in the Trzebownisko commune	55
A. BEDNAREK, M. ZALEWSKI, M. BŁASZCZYK, E. DĄBROWSKA, E. Czerwińiec, J. TOMASZEK, Denitrification rate in bottom sediments of Sulejów reservoir	63
E. Czerwińiec, Iron and manganese in surface water environment – differences and similarity in physical and chemical cycles	71
R. GRUCA-ROKOSZ, J. TOMASZEK, Temperature and oxygen profiles in the Solina reservoir	81
P. KOSZELNIK, J.A. TOMASZEK, R. GRUCA-ROKOSZ, Variations in the N:P ratio in the Solina reservoir ecosystem during 1999–2000	91
P. KOSZELNIK, J.A. TOMASZEK, Loading of the Rzeszów reservoir with biogenic elements – mass balance	99
J. TOMASZEK, M. GRABAS, Characteristics of biofilm growing in moving-bed biofilm system	107
M. GRABAS, J. TOMASZEK, Construction and fitting of the model of moving-bed biofilm reactors system	115

SPIS TREŚCI

W. NIEMIEC, W. SZYMBORSKI, Monitoring oddziaływanie składowiska odpadów komunalnych w Krynicy na środowisko	7
R. WIŚNIEWSKI, Próby eliminacji zakwitów sinicowych w Jeziorze Łasińskim	15
B. MOŃKA, M. ŁUCARZ, D. IZBIAŃSKA, Postęp w technologii oczyszczania ścieków na obszarze działania Regionalnego Zarządu Gospodarki Wodnej we Wrocławiu	27
M. WARDAS, M. PAWLIKOWSKI, A. KORZENIAK, A. BASIŃSKA, R. SZOTA, M. KŁĘK, Metale ciężkie w osadach systemu wodno-kanalizacyjnego Krakowa	35
L. GUTOWSKA-SIWIEC, M. ŚLESICKI, Matematyczne modelowanie przepływu i transportu zanieczyszczeń w wodach podziemnych	43

M. STRZELCZYK, T. KAMIZELA, L. WOLNY, Określenie wpływu stałego pola elektromagnetycznego na proces kondycjonowania osadów ściekowych.....	49
W. NIEMIEC, T. JASIŃSKI, A. PIECH, Badanie zawartości związków azotu w wodach podziemnych gminy Trzebownisko	55
A. BEDNAREK, M. ZALEWSKI, M. BŁASZCZYK, E. DĄBROWSKA, E. Czerwieneck, J. TOMASZEK, Przebieg procesu denitryfikacji w osadach dennych Sulejowskiego zbiornika zaporowego	63
E. Czerwieneck, Żelazo i mangan w środowisku wód powierzchniowych – różnice i podobieństwa w cyklach fizykochemicznych	71
R. GRUCA-ROKOSZ, J. TOMASZEK, Układy termiczno-tlenowe w zbiorniku Solińskim w 2000 r.	81
P. KOSZELNIK, J.A. TOMASZEK, R. GRUCA-ROKOSZ, Zmiany stosunku N:P w ekosystemie zbiornika Solińskiego	91
P. KOSZELNIK, J.A. TOMASZEK, Obciążenie Rzeszowskiego zbiornika zaporowego biogenami – bilans masowy	99
J. TOMASZEK, M. GRABAS, Charakterystyka biofilmu porastającego ruchomy nośnik w procesie zintegrowanego usuwania azotu i węgla	107
M. GRABAS, J. TOMASZEK, Budowa i kalibracja modelu układu reaktorów z ruchomymi nośnikami biomasy	115