

MARK Y. KIGEL, PH.D. – ENVIRONMENTAL ENGINEERING CONSULTANT

EDUCATION: Advanced Course in Professional Civil/Environmental/Sanitary Engineering – Rutgers University, New Brunswick, NJ

Ph.D. in Environmental Science (Wastewater Treatment Processes) – Kiev Institute of Civil Engineering, Kiev, Ukraine; M.S. in Environmental Engineering (Wastewater Treatment Technology) – Kiev Institute of Civil Engineering, Kiev, Ukraine; B.S. in Environmental Engineering (Hydraulics, Water Supply and Sewerage Systems, Water and Wastewater Treatment Facilities) – Kiev Institute of Civil Engineering, Kiev, Ukraine;

PUBLICATIONS: Over 120 published works including articles in scientific journals, books, reports, 13 patents in the former Soviet Union, six US patents, two patents in France, and one patent in Ukraine

EXPERIENCE:

Envar Services, Inc., Cranford NJ – R&D Division Manager

- ◆ Multi alternative computerized design of projects of upgrading the existing industrial wastewater treatment plants using innovative methods of treatment, nutrient removal, ultraviolet radiation, ozone oxidation, chlorination-dechlorination, and other methods of effluent disinfection.
- ◆ Development and implementation of process and apparatus for removal of heavy metals, particularly chromium, petroleum hydrocarbons and VOCs from groundwater including physical-chemical treatment, air stripping, vapor phase absorption and liquid phase adsorption units.
- ◆ Development and testing of an innovative technology for detoxification of chromium contaminated soil; the technology is protected by a US Patent.
- ◆ Development and practical implementation of new air pollution control systems for treating exhausts from chemical production plants, particularly petroleum hydrocarbon and paraformaldehyde contaminated emissions.
- ◆ Research and development of a new proprietary chromium contaminated soil remediation technology; the technology has been tested in a pilot-scale unit; the invention protected by a US Patent.
- ◆ Evaluation of performance of environmental protection and safety systems, development of concepts and design procedures based on optimization of the existing municipal and industrial water and wastewater treatment plants; statistical analysis of data obtained from monitoring of operation, regulatory audits of drinking water and wastewater treatment plants as part of environmental impact assessment, data acquisition, and risk analysis.
- ◆ Research, development, treatability and feasibility studies using multi-alternative bench-scale and pilot-scale testing and conceptual design techniques for various regional and local municipal and industrial wastewater treatment and disposal systems; particular emphasis focused on treatment of industrial wastes for oil terminals, steel mills, leather manufacturing

plants, distilleries, electroplating, chemical, petrochemical, paper mill, pharmaceutical, mining and other industries; remediation of groundwater and soils contaminated with heavy metals, VOCs, PHCs, etc.; treatment of industrial landfill leachates.

- ◆ Process design of wastewater treatment systems which included prediction of important environmental monitoring parameters such as pH, kinetic parameters of biological oxidation in various modes, nitrification and denitrification and phosphorus removal, in compliance with the federal, state and local permits; permit update and approvals with the NJDEP.
- ◆ Multi alternative project design of a dredging wastewater collection system including directional drilling under the river and the landfill with the emphasis on environmental compliance and optimization of pipeline and pumping station hydraulic parameters.

Dr. Kigel was head of the R&D and Computer Aided Design Department at the Design, Research and Development Institute for Water Supply and Wastewater Systems in Kiev, Ukraine. He developed multi-alternative computerized design of various oil refinery industrial wastewater treatment plants based on oil/water gravity separation, two-stage biological treatment, and effluent polishing. He managed the design of water supply systems and development of a technology for hazardous wastewater and sludge treatment and disposal at Chernobyl in Ukraine following the Nuclear Power Plant disaster in 1986, including comprehensive design for remediation of radionuclid contaminated water.

During his time at the Research Institute for Municipal Economy in Kiev, Ukraine, Dr. Kigel was Head of the Research Laboratory of Sewage and Industrial Wastewater Biological Treatment. He developed a classification system for biological wastewater treatment processes; following the classification, innovative treatment processes were proposed, developed and practically implemented. Dr. Kigel conducted an experimental investigation of new treatment processes which included biosorption; oxidation in activated sludge fluidized beds; extended aeration; contact stabilization; fixed activated sludge process with both steady-state and rotating submersed media; trickling filters with packaged media; oxidation ditches; packaged treatment units and plants; carousal type aeration tanks; fluidized bed reactors; tertiary treatment and aeration equipment; multi-stage processes. He also developed bench-scale, pilot plant and full size industrial treatment processes and procedures for investigation utilizing methods of optimal planning and parameter scale transfer techniques.

At Research Institute of Sanitary Technology in Kiev, Ukraine he was a scientific fellow and engineer/researcher for development and implementation of an electroplating wastewater treatment system for a computer manufacturing plant; the research work was based on multi-alternative investigation of physicochemical coprecipitation and electrochemical flotation-coagulation technologies; an optimum physicochemical coprecipitation following metal valiancy conversion was justified by the engineering economic analysis and selected for final project design. He also developed packaged, pre-manufactured water and wastewater treatment plants.

At Kiev City Construction Company, Kiev, Ukraine, Dr. Kigel was foreman and superintendent for construction of large sewage and storm water trunk sewers and water supply systems using methods of horizontal directional drilling, jacking under railroads, highways and streets, construction of deep pump stations, municipal and industrial wastewater treatment plants; project evaluation; preliminary design of earthwork and piping, construction material take-offs and estimates; start-up procedures including hydraulic testing.

AFFILIATIONS:

American Water Works Association

American Society of Civil Engineers

International Organization on Water Quality

Water Environmental Federation

Association of Engineers and Scientists – New Americans

AWARDS:

Second Prize (Silver Medal) from the USSR for an Innovative Industrial Wastewater Treatment System in the Donbass Region.

Member of International Who's Who Entrepreneurs, Awards of 1997 and 2000-2001