



WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: 2003KS30B

Title: Pharmaceutical Agents in Surface Waters: The Occurrence and Fate of Pharmaceuticals in Northeast Kansas Wastewater Treatment Facilities

Project Type: Research

Focus Categories: Waste Water, Agriculture

Keywords: antibiotics, pharmaceuticals, wastewater, Kansas, occurrence, fate

Start Date: 03/01/2003

End Date: 02/28/2004

Federal Funds: \$15000.00

Matching Funds: \$ 32593.00

Congressional District: 2nd District

Principal Investigators: Bhandari, Alok; Hunter, Robert

Abstract: Discharges from municipal wastewater treatment plants (WWTPs) are among the major sources of surface water and groundwater contamination by antibiotics and other pharmaceutical drugs. The presence of antibiotics in surface waters and groundwater is of concern because these chemicals have the potential to perturb microbial ecology, increase the proliferation of antibiotic-resistant pathogens, and pose serious threat to human health. Pharmaceutical chemicals are introduced into municipal wastewater streams from human excreta, which contains large quantities of non-metabolized or partially metabolized medicinal compounds. In order to develop solutions that control the release of antibiotics and other pharmaceutical agents into the environment, it is important to estimate the amounts of these chemicals discharged into surface waters and on land. Recent studies have detected more than 40 difference pharmaceutical drugs in environmentally significant quantities in discharges from wastewater treatment facilities in Europe and across the eastern United States. Very few studies, however, have been conducted in the Midwestern United States, and these studies have not correlated the occurrence of target pharmaceuticals to community types or removal in WWTPs to treatment processes and seasonal changes. The overall objective of proposed project is to evaluate the occurrence and fate of four widely prescribed antibiotics – amoxicillin, azithromycin, sulfamethoxazole, and ciprofloxacin – in raw and treated

wastewater, and biosolids at four northeast Kansas wastewater treatment facilities. Information generated from this research will provide critical and timely information about the mass input of these drugs at northeast Kansas WWTPs and extent of environmental release through effluent discharges and biosolids.

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