

OCCURRENCE OF EMERGING CONTAMINANTS AND EFFECTS OF RECHARGE EVENTS BELOW ON-SITE WASTEWATER DRAIN FIELDS AS RELATED TO SOIL TYPE

Jason Weckbacher, Joe C. Yelderman Jr., Jason Belden

ABSTRACT: This study focuses on septic effluent dispersal in soil and the potential for recharge events to affect wastewater contribution to groundwater. Specifically this study evaluates septic effluent as it is affected by recharge through different soil types. The recharge effects are of particular interest because precipitation can result in a statistically significant increase in either the concentration or the mass of effluent components. The methodology includes a column study designed to evaluate the effect of wastewater dispersal and recharge on three soil classifications (types). Those “types” include; type Ib soils which are sands and loamy sands, type II soils which are sandy loams and loams and type III soils which are more varied and include sandy clay loams as defined by the USDA soil classification system. Loading rates and volumes were based on the American National Standards Institute formula to simulate household usage (ANSI/NSF Standard 40 design loading) and local regulations for wastewater volume allowed per drain field area per soil type. Each soil was tested in triplicate. In total, nine columns, six inches in diameter, were constructed and packed with care taken to eliminate bypass flow. Tracer testing confirmed uniform discharge by soil type and no indication of bypass flow. Effluent draining from the soil columns was analyzed for CBOD, TSS, NH₃, NO₃, NO₂ and Emerging Contaminants (ECs) during periods of no recharge which served as control data and following each precipitation event. The results provide information that may improve the siting and design of on-site wastewater treatment systems (OWTS) and aid in determining the occurrence of ECs in the environment.