Determining Watershed-Scale Nutrient Inputs from Decentralized Wastewater Treatment Systems

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Abstract. As the focus of water quality management shifts to include nonpoint source control, environmental regulation of surface water quality is transferring to more performance-based methods through implementation of watershed management plans and Total Maximum Daily Loads (TMDLs). Given that 25% of the U.S. population is served by decentralized soil-based wastewater treatment systems (SBWTS) while a growing number of new homes are being constructed with SBWTS, the potential for these decentralized systems to contribute nonpoint source contamination to surface waters is increasing. However, little is known about the watershed-scale impacts of decentralized systems. Therefore, the purpose of this research is to evaluate the available knowledge of nutrient fate and transport from SBWTS on a site scale in an effort to develop a method to quantify the cumulative effects of SBWTS on a watershed scale. Based on this assessment, preliminary recommendations will be provided for a module to incorporate SBWTS into the Watershed Analysis Risk Management Framework (WARMF) model, a decision support system that provides local watershed stakeholders a roadmap for reaching a consensus on TMDLs and a watershed management plan. This research is being performed as part of a larger collaborative effort over the next two years to develop and test a methodology for assessing the water quality impacts of SBWTS including individual and cumulative effects on local water supply wells as well as downstream receiving waters.