

Performance of Onsite Wastewater Systems in Sandy, High Water Table Soils in the Coastal Region of South Carolina: Effects on Ground Water Quality

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The performance of OSWSs in shallow water table soils has long been a concern for environmental regulatory agencies and environmental health professionals. The effects of OSWS plumes on groundwater and surface waters have been an ongoing issue, especially in uniquely vulnerable coastal settings. The South Carolina Department of Health and Environmental Control, Bureau of Water, commissioned a study of the effects of OSWSs on groundwater quality. Twenty systems were randomly selected after screening of a population of several thousand residential OSWSs in Charleston County. Monitored systems were 5-15 years in service, conventional or shallow-conventional installations, in sandy soils where shallow groundwater had been identified as a site constraint during the SCDHEC site evaluation process. This study specifically sought to assess these systems in environments where infiltration trenches and seasonal high groundwater may have as little as six inches separation, as allowed under SCDHEC R.61-56. A monitoring program was designed to take a one-day 'snapshot' of groundwater conditions associated with the OSWS plume at these 20 locations. Monitoring involved use of a Geoprobe 61650; mounted on a John Deere 6x4 GatorTM vehicle which minimized site impacts on residential landscaping. Temporary piezometers were first installed to determine groundwater flow gradient. An array of seven temporary monitoring probes were then installed downgradient of the OSWS using the Geoprobe 61650;, enabling extraction of groundwater samples without well installation. Field parameters were determined on site, and samples were collected for laboratory analysis of fecal coliform, nutrients, and other water quality parameters. All field operations at each site were performed in one day, using these minimal impact techniques. This paper will present results of the groundwater study, and will frame the findings in the context of the minimum system / groundwater separation as mandated in the SCDHEC regulations. This work was funded by USEPA using CWA S.319 funds.