On-Site Wastewater Treatment
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Approximately 25% of the nation's housing units utilize on-site treatment and disposal systems. Mostly, on-site treatment consists of a septic tank-soil adsorption configuration, though surface disposal systems are used in areas where the soil is not suitable for an adsorption field. One of the concerns with the use of on-site sewage treatment systems is the potential for nitrate pollution of the ground and surface water resources. There are circumstances where on-site systems have been shown to provide the proper level of treatment without any negative effect to the surrounding environment, yet there are other circumstances where these systems are shown to have many negative effects on the environment. The main problem surrounding the use of on-site systems is the identification of the proper system for a given location, especially when there are so many different factors that must be considered when designing a system. Future system designs must consider the effects of nitrogen movement, bacterial movement, and movement of pharmaceuticals and primary care products caused by the discharge of the effluent from an on-site system. A proper design needs to be adaptable to the many climates and soils that exist within the state, while maintaining the integrity of the environment.

Current procedures for designing surface application systems for on-site sewage facilities (OSSFs) in Texas are being reconsidered. Concerns with the current procedures for designing sprinkler systems include the sizing of the spray field area, the volume of effluent storage required, and the absence of the uniformity of sprinkler distribution patterns. Currently the spray field area is determined by the estimated daily volume of water applied divided irrigation water requirement (evaporation minus precipitation). With any surface application system for wastewater effluent, control of the nitrogen applied is essential to minimize the impact on regional water resources, whether surface water or ground water. If an OSSF is designed with a typical type of sprinkler and no overlap of the spray pattern is provided, the potential mass of nitrogen that can move below the crops root zone can be substantial.

Overall, any on-site system that is to be installed needs to consider all of the design components to ensure they do not produce any negative effects to the environment. The final result may be a system that can be quite costly in comparison to those used in the past, but for long-term sustainability of the environment, it may be required.