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Karst is a term used to describe land areas that contain fractured limestone rock formations which are susceptible to erosion by flowing groundwater. The majority of Clarke County west of the Shenandoah River is located in karst topography and can include formations such as sinkholes, springs, sinking streams, and caves created by groundwater drainage systems. These drainage systems can flow for significant distances and can also produce underground voids and other areas of instability. Because of these characteristics, karst can produce significant challenges to groundwater quality for private wells and for the installation of septic systems for onsite sewage disposal. A map of karst areas can be found on the County’s MapsOnline GIS system -- [www.mapasonline.net/clarkecounty](http://www.mapasonline.net/clarkecounty).

Clarke County has local regulations addressing private wells and onsite sewage disposal systems on properties located in karst. These local regulations help to mitigate the potential for groundwater contamination – including well water for domestic use and consumption – and to ensure the long-term viability of wells and onsite sewage disposal systems.

[County Code Chapter 184 \(Wells\)](#) contains regulations that are more stringent than State requirements. Examples include:

- Private wells must be constructed and a minimum yield determined prior to issuance of a building permit for any structure that will use the well
- Minimum setback distances from potential contamination sources
- Minimum separation requirements between wells
- Special construction requirements for deep wells

[County Code Chapter 143 \(Septic Systems\)](#) also contains regulations that are more stringent than State requirements, including:

- Resistivity testing. Any application for an onsite sewage disposal system or certification letter with the Virginia Department of Health (VDH) (except for emergency repair applications) in karst areas shall require a subsurface investigation and review to be performed by a geotechnical engineer. The purpose is to determine whether voids or other anomalies are located under the proposed drainfield area. Resistivity testing is the applicant’s responsibility and is conducted by a qualified consultant hired by the applicant.
- Minimum separation distances between system components and site features
- Prohibition on the off-site placement of sewage disposal systems, in whole or in part, using an easement
- Prohibition on the use of mass drainfields
- Requirements for the provision of 100% reserve drainfield areas

For development projects that require approval of a site development plan per [Zoning Ordinance Section 6.2.2](#), a site review and investigation by a geotechnical engineer is required

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in order to determine the presence of karst features and potential impact on site development. If karst features are identified, a karst plan must be provided that depicts the features and the measures to be taken to mitigate impact of development on these features. The design criteria for site reviews and karst plans are found in [Zoning Ordinance Section 7.2.7 \(Environmental Reviews\)](#).

Usage of explosives in land development can have an adverse effect on wells and onsite sewage disposal systems. [County Code Chapter 86 \(Blasting\)](#) contains regulations prohibiting the use of explosives within a 100 feet of private wells, private onsite sewage disposal systems, public waterworks and sewerage treatment works, and perennial springs. A blasting plan must be submitted for review and approval by the Clarke County Board of Septic and Well Appeals for use of explosives within 100 and 500 feet of these features. Blasting plan applications are filed with the Department of Planning.

For more information, please contact:

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