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Why real estate lawyers need to know about geology

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The following headline appeared on AOL News on May 11, 2010: "Sinkhole Swallows Quebec House, Family Missing."

Unless they had already read "This Town Is Going Down, and Strawberries Share the Blame — Florida's Plant City Plagued by Sinkholes," which appeared on the front page of the April 19 edition of the Wall Street Journal, the story that followed this horrifying AOL headline should have put real estate attorneys on notice that sinkholes are yet another hazard that property owners can face without realizing that such a risk exists. After all, most property owners rarely think about what may be happening below the surface of their land.

Most real estate attorneys would be unable to respond to a call from a client who also saw the AOL article, asking, "Is this a risk that I should I worry about?"

As the real estate industry begins to embrace sustainability, real estate attorneys need to know more about science to assist their clients to assess and manage risks not traditionally associated with real estate law and practice. Unless an attorney knows something about geology, that attorney will not know how sinkholes form and the risks associated with sinkholes and thus will be unable to answer the client's questions about risk.

Sinkholes develop in what geologists call "karst terrain." A landscape dotted with sinkholes with the subsurface bedrock filled with underground cavities and caves are the dominating features of karst terrain.

According to the Illinois State Geological Survey (ISGS), karst terrain develops when the bedrock is comprised of a soluble rock such as limestone and the soil covering the bedrock is thinner than 50 feet. Karst landscapes form as water seeps through the soil and flows into cracks in the soluble bedrock. The bedrock slowly dissolves as water from rain and melting snow moves through it.

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As the bedrock dissolves, subsurface cavities form. These cavities fill with water and become shallow aquifers. Nearby towns and local farmers pump water from these aquifers to supply water for both drinking and irrigation.

A sinkhole forms when the underlying bedrock has dissolved and is weakened to the point that it is no longer able to support the surface. As it collapses, everything on the surface sinks into the void.

The giant sinkholes that make the evening news are the ones that open suddenly, swallowing houses, cars and everything else located on the surface. While they appear suddenly, they are the result of ongoing natural underground erosion of the bedrock.

While sinkholes occur naturally, human activity, such as increased pumping from a shallow aquifer, hastens the development of sinkholes. When groundwater levels in a shallow aquifer go down as a result of increased pumping, the support received by the surface from the water below is reduced and, without sufficient support, the surface collapses.

The new sinkholes in Plant City, Fla., discussed in the Wall Street Journal, were attributed to the millions of gallons of water local strawberry farmers pumped onto their strawberry plants to protect them during a record cold snap. The crop was protected, but the increased pumping emptied caverns in the limestone aquifer, which gave way, causing a home to sink three feet into the ground. The house was a total loss.

U.S. Geological Survey (USGS) Fact Sheet 007-3060 notes that development activity that increases the amount of water flowing into the subsurface hastens the sinkhole formation process and subsequent collapse of the surface. Construction of new buildings, parking areas, driveways and access roads change both the amounts and direction in which storm water flows into the subsurface. This suggests that all development in a karst terrain increases the risk of a sinkhole.

Surface collapses are not limited to karst areas and occur in areas with old underground mines. Water main breaks that wash away the surrounding soil are a common cause of roadway collapses in urban areas.

Sinkholes are more common than most people realize. According to the USGS, sinkholes appear throughout the United States, with the most found in Florida. They are also prominent in Alabama, Kentucky, Missouri, Pennsylvania, Tennessee and Texas. Downstate Illinois has karst terrain and sinkholes.

Karst terrain in the southern two-thirds of Illinois tends to follow the Mississippi and Ohio Rivers, with the largest sinkhole plain found in St. Clair, Monroe, and Randolph Counties — located southeast of St. Louis. Karst terrain is also found adjacent to the Mississippi in Jo Daviess County in the northwest corner of the state.

Surface collapse and the resulting damage to buildings and other structures such as roads built on the now-collapsed surface are the risks that first come to mind when thinking about sinkholes. With the exception of Florida, where owners can obtain coverage against the loss in the event the ground collapses — though

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efforts by insurers to reduce coverage are ongoing — property owners should not expect that their property insurance policy will cover damage cause by surface collapse.

While surface collapses are dramatic and highly visible, there is another risk associated with sinkholes that is not visible but is potentially more serious and more difficult to correct. That risk is groundwater contamination.

University of Florida Professor Carol Lehtola describes sinkholes as hypodermic needles with a direct line into the water supply (edis.ifas.ufl.edu/dh399 - 2009-05-06), which is why sinkholes should not be used to dump trash or as discharge points for drainage lines and septic tanks.

According to the ISGS, the lack of thick layers of soil to filter rain and snow melt as it seeps into the bedrock and then into the aquifer makes groundwater in karst landscapes especially susceptible to contamination and difficult to clean up. Insufficient filtering means that water flows into the aquifer contaminated with farm chemicals, animal waste, effluent from septic fields, and industrial waste.

A basic understanding of geology will enable the real estate attorney to ask the worried client, "Which bedrock is under your property?" The answer will start the risk assessment process.