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Getting to Higher Ground
Using Hydrologists to Assist in Flood Claims and Subrogation Analysis

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Claims for property damage caused by flood can present seemingly insurmountable obstacles for recovery, but with appropriate expert assistance and consultation, recovery potential can be found and realized in such claims if proper analysis and investigation are conducted. The skills of an expert hydrologist are called for in this context and, while such services can be expensive (as can be seen from the amount of data collection that must be undertaken for a liability evaluation), where the magnitude of the loss warrants such expenditure, the returns can be excellent.

From a legal standpoint, most jurisdictions follow common law rules with respect to the rights (“riparian rights”) of upstream and downstream property owners: if the upstream property owner changes the drainage patterns, the stream flows or the drainage characteristics of the upstream property and such changes cause damage to property downstream, the upstream owner is essentially held strictly liable for such damage, regardless of the intent or purpose underlying the upstream changes. The legal duty is upon an upstream property (“upper riparian”) owner to be sure that, before any changes in his property are made that affect water flow and drainage, potential risks of harm to downstream (“lower riparian”) property owners are considered and necessary steps taken to prevent such harm.
Initial Questions to Ask When Confronted With a Flood Loss

Floods that cause property damage may arise from genuine natural disasters or acts of God. Hurricanes, unforeseeably heavy rains and wind-driven water can all cause flooding and, in most of such occurrences, recovery potential is minimal. The key to identifying recovery potential in such circumstances is in making certain factual determinations through investigation:

• Has the upstream property owner made changes to natural or artificial water courses or drainage patterns?

• Has the upstream property owner made material alterations to the land that affect drainage and water flow (i.e., such as development by pavement of land or construction of buildings with roofs, etc., which tend to concentrate and accelerate water flow without absorption into the ground, thus increasing flow onto downstream property)?

• Has the upstream property owner permitted loose trash or debris to accumulate and block drains when carried away by surface water?

Gathering the Pertinent Information

If initial examination indicates such changes or other factors which point to potential liability for the upstream property owner, it will be necessary for the hydrologist to determine the precise area of the drainage basin that affects the damaged property and then to obtain an accurate survey, including topographical data, for that drainage basin so that modeling of the basin can be undertaken. In this process, the hydrologist will analyze the soil characteristics present in the drainage basin (to determine properties of absorption, rate of run-off, etc.), the nature of the flow patterns in the streams and ditches (to determine how much obstruction is present to resist flow and thus function as a partial dam to water flow), and soil cover, such as woods, pasture, croplands or impervious surfaces.
The hydrologist will then obtain the most reliable precipitation data available for the area in which the flooding occurred. In most areas, engineering of drains, streets, parking lots, storm water drains and other such developments to real property requires consideration of specified storm ratings. Storms are rated by (1) frequency, (2) duration and (3) amount of precipitation. Thus, a 100-year two-hour storm would be a storm in which, for a two hour period, the amount of precipitation occurring would be expected to occur, on the average, once every 100 years. Standards and applicable codes will vary from jurisdiction to jurisdiction as to what storm standard must be anticipated in the engineering and construction process for improvements to real property, and such standards must also be determined by the hydrologist during his investigation.

Note that the 100-year storm ratings are not necessarily connected to 100-year flood occurrences (which address instead the statistical probability in which a given stream can be expected to overflow its banks by a specified amount in a specified time period). There are a number of climatological and periodic storm intensity data resources available from the National Weather Service at www.noaa.gov. Since precipitation intensity and amounts can vary widely over relatively small geographic areas during the same storm, obtaining the most accurate data for precipitation and other conditions is crucial and it is usually necessary to obtain more local information from convenient sources (such as golf courses or waste water treatment facilities) that collect rainfall data. Although these sources may not be “official” they can tend to shed realistic light on what may well be an isolated rainfall event. On occasion, a large variance between the established statistical precipitation data for a region and the actual local data for an occurrence can help establish whether the flood event was foreseeable (and therefore preventable) or was truly an unavoidable occurrence.

**Analyzing the Information**

A hydrologist will take all of the data collected and then use a computer software package to model the flood event to determine whether a hypothesis regarding the cause of the flooding can be proven scientifically. Obviously, if a flood would have occurred at the same or generally comparable severity regardless of whether or not upstream property changes were made, there is no basis for assertion of liability against an upstream property owner. Computer modeling permits analysis of various “what if” scenarios so that the hydrologist can express accurate opinions about...
the effect that any particular upstream change or condition has upon the water flow, drainage and downstream consequences. Computer modeling requires accurate data, reasonable assumptions and considerable skill and experience on the part of the hydrologist. If done properly, modeling should be able to closely approximate the actual flood conditions observed at the loss site.

**Retaining the Right Expert**

The primary qualifications to look for in an engineer retained to consult on a flood matter is specific hydrological engineering experience. This experience will enable the hydrologist to identify critical factors and necessary data for calculations. This experience will also teach the engineer that actual field work is crucial both to data collection and computer modeling. The engineer should also be knowledgeable regarding both the capabilities and the limitations of computer modeling. Such modeling is, ultimately, only a tool for the formation of opinions with respect to the causes of flood events.

**Actual Recoveries from Flood Losses**

In practical application, this type of investigation has resulted in significant recovery in a matter involving flooding of an assisted living facility after heavy rains. This was a particularly egregious example of flooding, in that elderly residents had to be evacuated to hotels in the pre-dawn hours during the rainfall, which resulted in much unfavorable publicity for the facility and a substantial claim for property damage and interruption of business. A detailed hydrological analysis, conducted as described above, demonstrated that the cause of the flooding was an upstream developer’s actions in raising the grade of an emergency overflow on a dam, along with diverting part of the outflow from the subject drainage basin into a ditch behind the assisted living facility, causing it to have to drain drastically more water than it was ever designed to do.

In another instance, a steel milling facility was flooded in a heavy (but not extraordinary) rainfall. Careful investigation revealed that an upstream property owner had permitted broken-down corrugated boxes to be blown and washed from its loading dock. The cardboard ultimately was carried by water and blocked storm drains, resulting in the flooding that affected the milling facility. Because the cardboard boxes were marked with the name of the upstream source, it was easy to then track the boxes back to that upstream owner and assign liability.
Conclusion

As described above, flood claims present unique challenges that require the assistance of knowledgeable subrogation counsel and hydrologists with hands-on experience. As always, Cozen O’Connor stands ready to assist you in evaluating and analyzing subrogation potential arising in even the toughest of claims.

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