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Environmental Hazards from Floods, Hurricanes and Tornadoes



“Those who cannot remember the past are condemned to repeat it.”

—George Santayana, American philosopher, essayist, poet and novelist

The reports are coming in from the natural disasters in the heartland of the United States this spring. It is clear that a lot of building owners, volunteer responders and even trained restoration professionals were doomed to repeat mistakes that put them and future occupants of many damaged buildings at risk for future health problems.

While there are different types of environmental hazards associated with tornadoes as compared to flooding or hurricanes, there are many common concerns. For example, the destruction caused by the high winds of tornadoes and hurricanes scatters asbestos throughout the debris. Although there were a handful of stories in the popular press about the dangers of asbestos as people sorted through the damage of tornado-ravaged homes in places like Joplin, Mo., and Tuscaloosa, Ala., photos and reports by restoration professionals in the impacted areas indicate that only a small percentage of those working with damaged structures were using appropriate personal protective equipment.

The Dangers of Asbestos

It may not seem like a big deal to wear appropriate safety gear, especially respiratory protection, during assessment and salvage operations, but it is! Asbestos is an invisible, long-term, silent killer. Even short duration exposures can cause serious problems 20 years down the road. Of course, the problem is magnified as the work stretches out on a damaged building or as workers move from structure to structure.

Federal and state OSHA regulations require restoration contractors to evaluate potential asbestos hazards at every construction project and protect their workers accordingly. Yet

I have seen little evidence that the majority of restoration contractors have asbestos at the top of their list of concerns when starting a project. Asbestos has been verified as a component of more than 3,000 products used in the United States and Canada. There is a great chance of running into it in damaged houses.

With so many past uses, it makes sense for contractors to understand why and how asbestos was used so they can exercise appropriate caution when dealing with damaged older structures. Illustration 1 offers a summary of the properties of asbestos and broad categories of asbestos-containing products.

Houses built after 1980 are not guaranteed to be asbestos-free. Asbestos-containing pipe and boiler insulation, as well as spray-on acoustical plaster, have been banned, but despite what most contractors believe, the United States still does not have a complete restriction on asbestos in new products. Newer houses can have asbestos shingles, floor tiles, drainpipes and other products that are considered to be non-friable (i.e., cannot be crushed or pulverized by hand pressure). Indeed, more than 20 years after the initial ban on asbestos products was put into place, a 2003 Environmental Protection Agency (EPA) study verified that the “magic mineral,” as asbestos was once called, is found in many types of current products. (See Illustration 2)

What Lurks in the Water?

Flood-damaged structures have a number of additional environmental hazards besides potential asbestos exposure. A May 11 ABC News story about the Mississippi flooding noted that the water moving from the heartland down to the Gulf of Mexico “carries a mix of fertilizer, oil, pesticides, trash and farm runoff.” Tests of water samples found that *E. coli* and *coliform* were 2,000 times the acceptable limits. Surprisingly, the ABC test results did not show evidence of gasoline, oil or chemical toxins. The samples did recover trace levels of heavy metals.

This information is consistent with the EPA sampling in the New Orleans area following Hurricane Katrina and the subsequent flooding

from Lake Pontchartrain. As the RIA indicated in its 2005 document Flooding Cleanup Advisory for Restoration Professionals, environmental contaminants found in flood waters could include:

- Bacteria – e.g., gram negative bacilli from raw sewage or animal feces
 - Heavy metals – e.g., arsenic, beryllium, cadmium, chromium, copper, lead, nickel, silver and zinc
 - Diesel range organics – e.g., oil
- (Note: N-95 filtering masks do not provide adequate protection against oil mist.)
- Pesticides – e.g., DDT, chlordane, heptachlor and non-water soluble organo-chlorine compounds
 - Mold
 - PCBs

Dealing With the Risks Intelligently

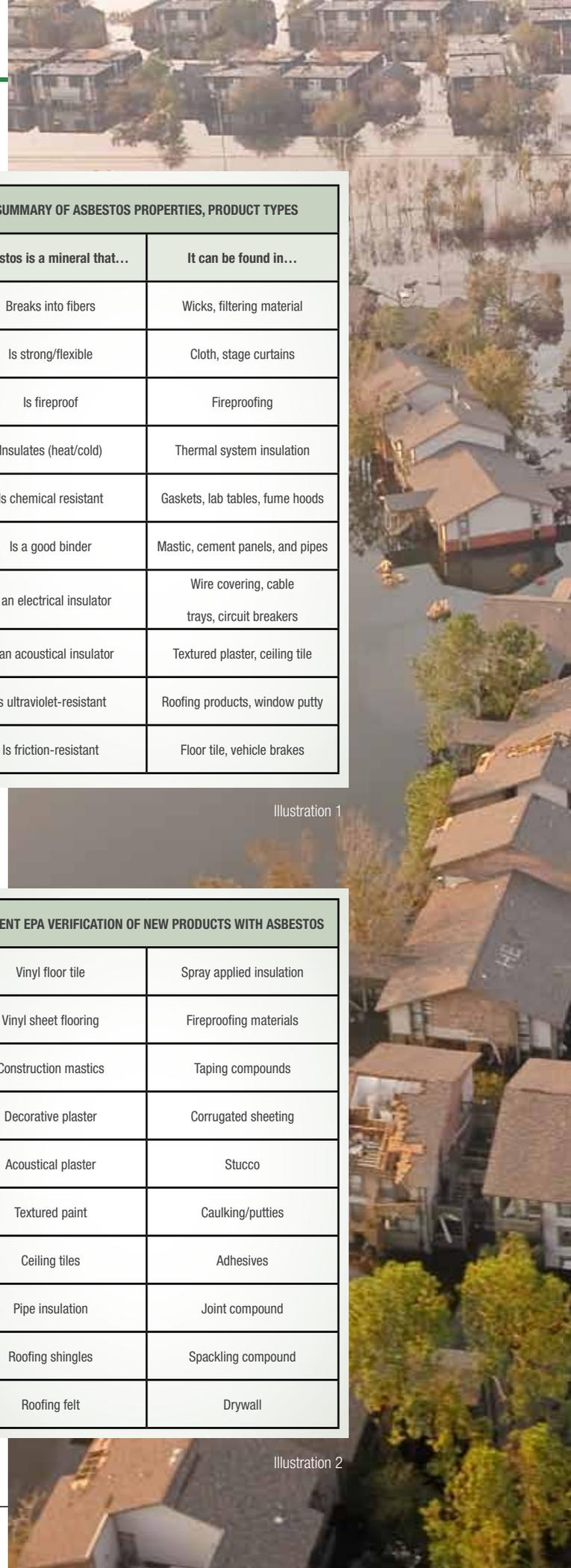
Given these environmental concerns related to tornadoes, flooding and hurricanes, restoration contractors should follow the Federal Emergency Management Agency (FEMA) approach developed in 2005 to mitigate such disasters:

1. Air out
2. Move out
3. Tear out
4. Clean out
5. Dry out

In addition, remembering some lessons from previous disasters will keep you from repeating past mistakes. I leave you with a few critical items from the RIA flood cleanup advisory:

- Bleach is a destructive and ineffective antimicrobial and should not be used.
- Train employees on the risks they will encounter, not on every aspect of the job.
- OSHA requires proper PPE, not overprotection. Consider breathable coveralls, P-100 dust masks (more comfortable than half-face respirators) and powered air purifying respirators.
- Be aware of the symptoms of heat stress and keep employees well hydrated. **RIA**

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SUMMARY OF ASBESTOS PROPERTIES, PRODUCT TYPES	
Asbestos is a mineral that...	It can be found in...
Breaks into fibers	Wicks, filtering material
Is strong/flexible	Cloth, stage curtains
Is fireproof	Fireproofing
Insulates (heat/cold)	Thermal system insulation
Is chemical resistant	Gaskets, lab tables, fume hoods
Is a good binder	Mastic, cement panels, and pipes
Is an electrical insulator	Wire covering, cable trays, circuit breakers
Is an acoustical insulator	Textured plaster, ceiling tile
Is ultraviolet-resistant	Roofing products, window putty
Is friction-resistant	Floor tile, vehicle brakes

Illustration 1

CURRENT EPA VERIFICATION OF NEW PRODUCTS WITH ASBESTOS	
Vinyl floor tile	Spray applied insulation
Vinyl sheet flooring	Fireproofing materials
Construction mastics	Taping compounds
Decorative plaster	Corrugated sheeting
Acoustical plaster	Stucco
Textured paint	Caulking/putties
Ceiling tiles	Adhesives
Pipe insulation	Joint compound
Roofing shingles	Spackling compound
Roofing felt	Drywall

Illustration 2