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Sarah Kenney <skenney@barringtonhills-il.gov>

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RKosin <rkosin@barringtonhills-il.gov> **Sat, Jan 15, 2011 at 12:19 PM**
Reply-To: rkosin@barringtonhills-il.gov
To: Dolores Trandel <clerk@barringtonhills-il.gov>
Cc: Sarah Kenney <skenney@barringtonhills-il.gov>

New doubts cast on safety of common driveway sealant

By Michael Hawthorne, Chicago Tribune reporter
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If a company dumped the black goop behind a factory, it would violate all sorts of environmental laws and face an expensive hazardous-waste cleanup.

But playgrounds, parking lots and driveways in many communities are coated every spring and summer with coal tar, a toxic byproduct of steelmaking that contains high levels of chemicals linked to cancer and other health problems.

Nearly two decades after industry pressured the U.S. Environmental Protection Agency to exempt coal tar-based pavement sealants from anti-pollution laws, a growing number of government and academic studies are questioning the safety of the widely used products. Research shows that the tar steadily wears off and crumbles into contaminated dust that is tracked into houses and washed into lakes.

In Lake in the Hills, a fast-growing McHenry County suburb about 50 miles northwest of Chicago, researchers from the U.S. Geological Survey found that driveway dust was contaminated with extremely high levels of benzo(a)pyrene, one of the most toxic chemicals in coal tar. The amount was 5,300 times higher than the level that triggers an EPA Superfund cleanup at polluted industrial sites.

High levels also were detected in dust collected from parking lots and driveways in Austin, Texas; Detroit; Minneapolis; New Haven, Conn., and suburban Washington, D.C. By contrast, dramatically lower levels were found in Portland, Ore.; Salt Lake City and Seattle, Western cities where pavement sealants tend to be made with asphalt instead of coal tar.

The findings raise new concerns about potential health threats to people and aquatic life that went undetected for years.

"This is a real eye-opener, even for scientists who work frequently with these chemicals," said Barbara Mahler, a USGS researcher involved in the studies. "Such high concentrations usually are found at Superfund sites, but this could be your church parking lot or your school playground or even your own driveway."

About 85 million gallons of coal tar-based sealants are sold in the United States each year, according to industry estimates. There are no comprehensive figures on where it is applied, but in Lake in the Hills, researchers determined that 89 percent of the driveways are covered in coal tar.

Manufacturers promote the sealants as a way to extend the life of asphalt and brighten it every few years with a fresh black sheen. Contractors spread a mixture of coal tar, water and clay using squeegee machines and spray wands, or homeowners can do it themselves with 5-gallon buckets bought at hardware stores.

The makers of coal tar sealants acknowledge that the products contain high levels of benzo(a)pyrene and other toxic chemicals known collectively as polycyclic aromatic hydrocarbons, or PAHs. But they deny their products are responsible for the chemical contamination found in government studies, saying it could be coming from vehicle exhaust or factory emissions that travel long distances and eventually settle back to earth.

As more research identifies coal tar sealants as a top source of PAH-contaminated driveway dust and lake sediment, manufacturers have started to fund their own research to question the findings. Lobbyists also are offering contractors free admission to an upcoming seminar that promises to show them ways to "protect the industry," including a promotional DVD they can use to "help market sealcoating to your customers."

"Nobody in our industry wants to hurt anybody," said Anne LeHuray, executive director of the Pavement Coatings Technology Council, an industry trade group. "The science is still evolving. If our products are a source, they are a very localized source."

The supply chain for the sealants begins at about two dozen factories, most of them around the Great Lakes

or in western Pennsylvania, that bake coal into high-energy coke used in steel production. Companies figured out a century ago that much of the waste could be refined and sold to make other products, and they started adding it to pavement sealants after World War II.
One of the biggest suppliers is Koppers, a Pittsburgh-based company that processes coal tar at a plant in west suburban Stickney. The plant made about a third of the nation's refined coal tar in 2007, most of it used in aluminum production, according to an industry slide presentation. A company spokesman declined to comment.
Coal tar remains in widespread use even though its dangers have been known for centuries. During the late 1700s, many chimney sweeps exposed to tar in coal-heated London developed scrotal cancer, and decades later doctors determined that workers who coated railroad ties with tar-based creosote had high rates of skin cancer.
More recently, federal and state officials have prosecuted dozens of companies for illegally dumping coal tar and fouling neighboring areas with PAHs. At least 40 percent of the polluted industrial sites on the EPA's Superfund cleanup list have problems with PAH contamination, as do scores of other sites that haven't made the list.
Major cleanups in the Chicago area include a site in west suburban Oak Park, where a factory that turned coal into natural gas during the late 1800s dumped coal tar on property that later became a village park. Utilities spent at least $50 million digging 40 feet down into Barrie Park during the mid-2000s to haul out more than 300,000 tons of contaminated soil.
In 2007, the U.S. EPA ordered a company to dig up the yards of more than three dozen homes in Chicago's Little Village neighborhood where coal tar had oozed from an abandoned roofing plant nearby. The agency also urged residents to prevent their children from playing in dirt around their houses and to avoid gardening. The amount of PAHs that triggered the Oak Park and Little Village cleanups was substantially lower than what researchers found in driveway dust in Lake in the Hills — 0.3 and 10 parts per million, respectively, compared with up to 9,600 parts per million.
Despite the EPA's long-standing worries about the chemicals, industry successfully lobbied to exempt coal tar pavement sealants when the agency tightened hazardous-waste rules for coke ovens during the early 1990s. The little-noticed change made it easier for manufacturers to keep selling the products, which can contain as much as 50 percent PAHs by weight.

Agency spokesmen declined to make anyone available to discuss the exemption, but said in a statement there are no plans to revise it. "EPA regulations allow for the legitimate recycling of coal tar under certain specified parameters," the statement said.
Scientists started to track the movement of coal tar sealants into homes and lakes about a decade ago, after pinpointing the source of alarmingly high levels of PAHs in Barton Springs, a popular swimming hole in Austin, the Texas capital. Tom Bashara, an environmental investigator, noticed that pollution hotspots in a creek flowing into the pool were near parking lots coated with coal tar.
The finding led Mahler and her colleagues at a USGS center in Austin to expand the research to other communities around the nation, including Lake in the Hills, where the number of households more than quadrupled between 1990 and 2006.
Among other things, they found rising amounts of PAHs in the sediment of lakes where coal tar sealants are commonly used, but dramatically lower amounts in areas where asphalt-based sealants are preferred.
In Austin, the scientists also found that dust inside apartments next to parking lots coated with coal tar was 25 times more contaminated than the dust in units next to lots coated with asphalt or left unsealed. Young children could be the most vulnerable to exposure, the researchers concluded, because they play on or near floors where dust collects.
After industry lawyers challenged the findings, arguing that other sources were to blame, the USGS scientists published another peer-reviewed study late last year that traced the contamination back to coal tar sealants. By analyzing several feet of sediment, they determined that concentrations in the biggest lake in Lake in the Hills, known as Woods Creek Lake, didn't begin to spike until the area was more intensely paved with parking lots and driveways in the early 1990s. They spotted similar trends in other cities, including Orlando, Fla., and suburban Washington.
"You just don't otherwise see these kinds of concentrations in a typical urban, residential environment," said Peter Van Metre, another USGS scientist working on the research.
Coal tar sealants have been banned in Austin; Dane County, Wis.; Washington, D.C., and several Minnesota cities. Home Depot and Lowe's have pulled coal tar-based sealants from their shelves, though they remain widely available elsewhere.
In Lake in the Hills, officials posted a one-page brochure at Village Hall outlining the difference between coal tar- and asphalt-based sealants. The village stopped using coal tar sealants on its own property but declined

to ban them outright.
"We've already solved the problem," said Gerald Sagona, the village administrator.
PAHs are of particular concern because they don't break down easily. The USGS found that although concentrations of banned chemicals like DDT and PCBs are slowly declining in the environment, levels of PAHs are increasing.
"There is a very clear connection between the use of these sealants and high levels of contamination downstream," said Alison Watts, a University of New Hampshire researcher whose own studies tracked PAH-contaminated runoff from parking lots. "The problem isn't going to go away if you keep putting this stuff down every three years."

mhawthorne@tribune.com

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