

Coal-Tar-Based Pavement Sealcoat, PAHs, and Environmental Health

Sealcoat is the black, viscous liquid applied to many asphalt parking lots, driveways, and playgrounds in North America to protect and enhance the appearance of the underlying asphalt. Coal-tar-based pavement sealcoat is a potent source of polycyclic aromatic hydrocarbon (PAH) contamination in urban and suburban areas and a potential concern for human health and aquatic life.

BACKGROUND

Pavement sealcoat is a commercial product marked for use primarily on parking lots and driveways and is rarely used on public roads. Most sealcoat products are either coal-tar or asphalt emulsion. Coal tar and coal-tar pitch, both used in sealcoat products, have extremely high concentrations of PAHs, and both are classified as known human carcinogens. Coal-tar-based sealcoat products typically are 20 to 35 percent coal tar or coal-tar pitch. Asphalt and asphalt-based sealcoat products have much lower concentrations of PAHs.

For historical and economic reasons, coal-tar-based sealcoat is more common east of the Continental Divide (except in those states, counties, and municipalities where its use is prohibited), and asphalt-based sealcoat is more west of the Continental Divide. Coal-tar-based pavement sealcoat typically contains 35,000 to 200,000 mg/kg (parts per million, or ppm) PAHs, about 100 times more PAHs than in used motor oil and about 1,000 times more PAHs than in sealcoat products with an asphalt (oil) base. Levels of PAHs in dust swept from sealed parking lots to the east and west of the

**Status -
Active**

Contacts

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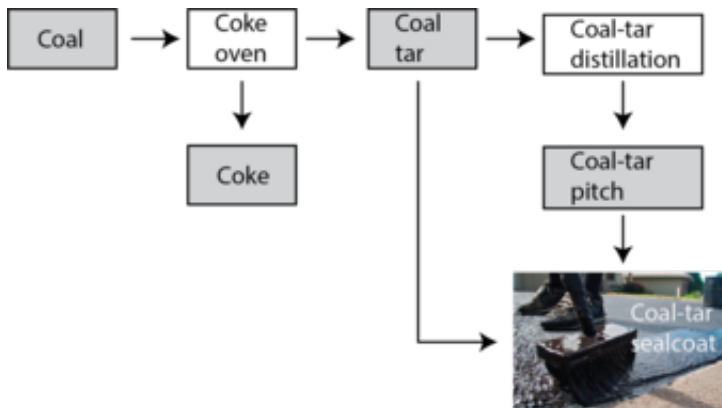
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[polycyclic aromatic
hydrocarbons](#)

Continental Divide reflect this difference in use, with PAH concentrations in sealed-pavement dust the East about 1,000 times higher than concentrations in the West.

What are coal tar and coal-tar pitch?

Coal tar is a byproduct of the coking, liquefaction or gasification of coal. Coal-tar pitch is the residue that remains after the distillation of coal tar, that is, the thick black liquid remaining after various oils are removed from coal tar for use in the manufacture of industrial and consumer products. Coal-tar pitch is separated, or "refined", into 12 grades of viscosity. The most viscous grade, RT-12, is used in coal-tar-based sealcoat. The primary use of coal-tar pitch is in electrode manufacturing for the aluminum industry and for steel arc furnaces.



Coal tar is a byproduct of the coking of coal, and coal-tar pitch is the residue that remains after the distillation of coal tar. Coal tar and coal-tar pitch are used in coal-tar-based sealcoat products, although use of coal-tar pitch is more common than use of coal tar. Both coal tar and coal-tar pitch are known human carcinogens. Learn more about coal-tar-based sealcoat [here](#).

What are PAHs?

PAHs are a group of chemicals created by heating or burning material that contains carbon. There are many sources of PAHs to the environment, representing a wide range of PAHs concentrations, including asphalt (2-9 milligrams per kilogram, or mg/kg), tire particles (84 mg/kg), used motor oil (730 mg/kg), and coal-tar-based sealcoat (34,000-202,000 mg/kg). PAHs cause cancer, mutations, birth defects, and/or death in fish, wildlife, and invertebrates. Several PAHs are photoactivated, meaning that their toxic effects are greatly intensified when exposed to sunlight. The EPA has classified seven PAHs as probable human carcinogens, and 16 PAHs as Priority Pollutants.

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Types of Water
Aquatic Biology and
Ecosystems
Common Water
Issues
Contaminant
Transport Modeling
Ecosystem Health
Emerging
Contaminants
Lakes and Reservoirs
Pollution (Chemical
and Biological)
Streams and Rivers
Urban Water
Concerns
Environmental Health
Water

AS SEALCOAT WEARS OFF, WHERE DOES IT GO?

Abraded dried sealcoat particles containing high concentrations of PAHs and related chemicals can be transported by rain, wind, car tires, and even our feet to surrounding areas, including our homes. Concentrations of PAHs in runoff, sediment, soils, and dust near coal-tar-sealcoated pavement are substantially higher than concentrations in those media near concrete pavement, unsealed asphalt pavement, and asphalt pavement with asphalt-based sealcoat.



Coal-tar-based sealcoat is a potent source of PAHs and related chemicals. Worn particles of coal-tar-based sealcoat are transported by rain, wind, tires, and even our feet from pavement to other environmental settings. Sealcoat product (A), after it dries, gradually abrades to a powder and becomes part of the dust on the pavement (B). Pavement dust is transported by rainfall runoff (C) to stormwater-management devices (D) or to receiving streams and lakes (E). Pavement dust also adheres to tires (F) that track it onto unsealed pavement, and wind and runoff transport the dust to nearby soils (G). Sealcoat particles tracked into residences can become incorporated into the house dust (H). Graphic from [USGS Fact Sheet 2016-3017](#).

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Setting	PAH concentration* (milligrams per kilogram)	
	Coal-tar-sealcoat settings	Non-coal-tar-sealcoat settings
(A) Sealcoat products	66,000	50
(B) Pavement dust	2,200	11
(C) Runoff, particles	3,500	54
Runoff, unfiltered water	62	4
(D) Stormwater-management-device sediment	646	2
(E) Lake sediment	33	0.4
(F) Particles adhered to tires	1,380	3
(G) Soil	105	2
(H) House dust	129	5

*Concentrations are means or medians. References and additional information are provided in Mahler and others (2012), dx.doi.org/10.1021/es203699x.

Concentrations of polycyclic aromatic hydrocarbons (PAHs) in settings near pavement sealed with coal-tar-based sealants were substantially higher than concentrations in settings where coal-tar sealant was not used. Letters refer to lettered settings in figure above. Graphic from [USGS Fact Sheet 2016-3017](#).

POTENTIAL RISKS TO HUMAN HEALTH

PAHs from coal-tar-based sealcoat contaminate house dust. House dust is an important pathway for human exposure to many contaminants, including PAHs. This is particularly true for small children, who spend time on the floor and put their hands and objects into their mouths. In a study of 23 ground-floor apartments, PAH levels in house dust in apartments with parking lots sealed with a coal-tar-based product were 25 times higher than in house dust in apartments with parking lots with other surface types (concrete, unsealed asphalt, and asphalt-based sealcoat). No relation was found between PAHs in house dust and other possible indoor PAH sources such as tobacco smoking and fireplace use.

The pre-schooler living in a residence adjacent to coal-tar-sealed pavement who has relatively low hand-to-mouth activity consumes about 2.5 times more PAHs from house dust than from their diet. For the more active pre-schooler, whose hand-to-mouth activity is higher, the PAH intake from house dust is nearly 10 times more than the PAH intake from their diet. These findings upset the paradigm that diet is the greatest source of PAHs for small children.

POTENTIAL RISKS TO AQUATIC LIFE

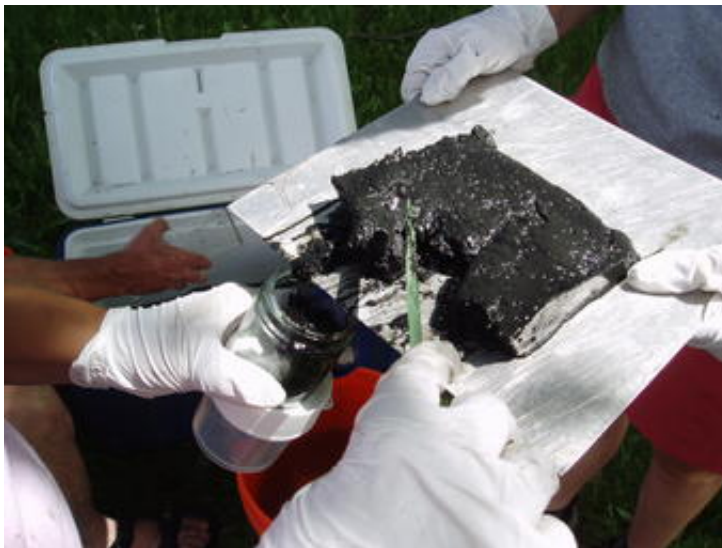
Runoff from coal-tar-sealcoated pavement is acutely toxic to aquatic biota.

Exposure to runoff from coal-tar-sealed pavement collected as much as 42 days after sealcoat application resulted in 100 percent mortality to two commonly tested laboratory organisms: day-old fathead minnows (*Pimephales promelas*) and water fleas (*Ceriodaphnia dubia*). In contrast, minnows and water fleas exposed to runoff from unsealed pavement experience no more than 10 percent mortality. When the minnows and water fleas were also exposed to simulated sunlight, which intensifies the toxicity of some PAHs, runoff collected 111 days (more than 3 months) after sealcoat application caused 100 percent mortality to both species, and caused 100 percent mortality to water fleas even when diluted to 10 percent of its original strength. These results demonstrate that runoff from coal-tar-sealcoated pavement continues to be toxic from aquatic organisms long after the 24- to 48-hour curing time.

A subsequent collaborative study by researchers at the National Oceanic and Atmospheric Administration (NOAA), U.S. Fish and Wildlife Service, and University of Washington reported that coal-tar-sealcoat runoff is acutely lethal to juvenile coho salmon (*Oncorhynchus kisutch*) and causes a wide spectrum of abnormalities to zebrafish (*Danio rario*) embryos. The study also reported that filtration of the runoff through a bioretention system substantially reduced toxicity.

COAL-TAR-BASED SEALCOAT, PAHS, AND STREAM AND LAKE SEDIMENT

Dust on coal-tar-sealed parking lots contains bits of abraded sealcoat particles, and measured concentrations of PAHs in the dust swept from coal-tar-sealed pavement typically are in the thousands of milligrams per kilogram. In some cases, stormwater runoff



Sediment cores from lakes and reservoirs can be used to reconstruct contaminant histories in watersheds. Sediment-core analyses indicate that concentrations of PAHs in many U.S. urban lakes are increasing, and

washes high- *multiple lines of evidence indicate that the source of the PAHs is coal-tar-based pavement sealants. (Credit: Pete Van Metre, USGS)*

PAH pavement dust to a stormwater management device, such as a retention pond, leading to high costs of disposal. PAH-contaminated dust that is not trapped by management devices can be transported to streams and lakes, where it settles in the stream or lake bed. Application of a wide range of "forensic" methods has indicated that, in areas where it's used, coal-tar-based sealcoat is the primary source of PAHs to [stream](#) and [lake](#) sediment.

Analysis of lake sediment cores demonstrates that coal-tar-based sealcoat is a major contributor to upward trends in PAHs in urban lakes across the U.S. In Austin, Texas, coal-tar-sealcoat was banned in 2006—sediment cores collected in 2012 and 2014 from Lady Bird Lake, the primary receiving water body for the Austin area, showed a 58 percent decrease in PAH concentrations since the peak prior to the ban.

► Read more about use of sediment cores to reconstruct contaminant histories [here](#).

Other studies have used different approaches to determine the source of PAHs to urban stream and lake sediment and come to a similar conclusion regarding source. Those approaches include a [land-use-based analysis](#) and [organic petroscopy](#). Those studies concluded that coal-tar-based sealcoat was the source of 70 to 80 percent of the PAHs in the sediment of the water bodies studied.

AIR QUALITY CONCERNS

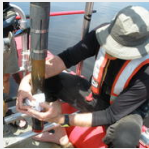
Although unseen, releases of PAHs to the atmosphere (volatilization) from freshly coal-tar-sealed pavement are tens of thousands of times higher than from unsealed pavement. Volatilization is a potential human-health concern because inhalation is an important pathway for human exposure to PAHs. [Volatilization of sealed surfaces is highest just after application](#) and decreases rapidly over the following weeks. Nonetheless, [volatilization continues long after application](#)—PAH releases to the atmosphere from parking lots sealed from 3 to 8 years prior to sampling were on average 60 times higher than PAH releases from unsealed pavement. The results suggest that PAH emissions from new coal-tar-based sealcoat applications each year nationwide (~1000 Mg) are larger than annual vehicle emissions

of PAHs.

ADDITIONAL RESOURCES

- [National Cancer Institute](#)
- [Centers for Disease Control and Prevention](#)
- [Environmental Protection Agency](#)
- [Agency for Toxic Substances and Disease Registry](#)

Follow the links below to access web pages related to coal-tar-based sealcoat, PAHs, and environmental and human health.



Date published: FEBRUARY 27, 2019

Status: Active

Water-Quality Trends From Lake Cores

Sediment cores let us look back in time at the contaminant history of a watershed. Learn about what lake and reservoir sediment cores tell us about trends in metals, organochlorine pesticides, polycyclic aromatic hydrocarbons, and other sediment-related contaminants.

Contacts: [Peter C Van Metre](#)

Attribution: [Water Resources](#)



Date published: SEPTEMBER 17, 2018

Status: Active

Sediment-Associated Contaminants

Stream, river, and lake bed sediment are reservoirs for many contaminants.

These contaminants include some “legacy” contaminants, like DDT, PCBs, and chlordane, and chemicals currently in use, like the insecticide bifenthrin and many flame retardants. Learn about techniques used to study sediment-associated contaminants and their importance to aquatic biota.

Contacts: [Barbara Mahler](#)

Attribution: [Water Resources, National Water Quality Program](#)



Date published: SEPTEMBER 17, 2018

Status: Active

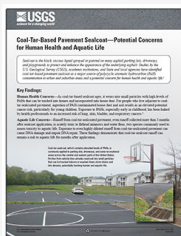
Stream Ecology

Who lives in your stream? Rivers and streams, even small ones, are teeming with a vast number of species, including fish, aquatic invertebrates, and algae. Stream ecology is the study of those aquatic species, the way they interrelate, and their interactions with all aspects of these flowing water systems.

Contacts: [Daren M Carlisle, Ph.D.](#)

Attribution: [Water Resources, National Water Quality Program](#)

Use the links below to access USGS-authored publications on coal-tar-based sealcoat, PAHs, and human and environmental health.



Year Published: 2016

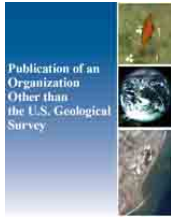
Coal-tar-based pavement sealcoat—Potential concerns for human health and aquatic life

Introduction Sealcoat is the black, viscous liquid sprayed or painted on many asphalt parking lots, driveways, and playgrounds to protect and enhance the appearance of the underlying asphalt. Studies by the U.S. Geological Survey (USGS), academic institutions, and State and local agencies have identified coal-tar-based pavement sealcoat as a major...

Mahler, Barbara; Woodside, Michael D.; Van Metre, Peter C.

Attribution: [Water Resources, National Water Quality Program](#)

[View Citation](#) ✓



Year Published: 2017

Coal-tar-based pavement sealants—a potent source of PAHs

Pavement sealants are applied to the asphalt pavement of many parking lots, driveways, and even playgrounds in North America (Figure 1), where, when first applied, they render the pavement glossy black and looking like new. Sealant products used commercially in the central, eastern, and northern United States typically are coal-tarbased, whereas...

Mahler, Barbara; Van Metre, Peter C.

Attribution: [Texas Water Science Center, Water Resources, , Region 6: Arkansas-Rio Grande-Texas-Gulf](#)

[View Citation](#) ✓



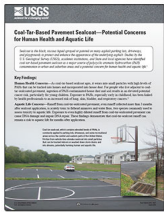
Year Published: 2017

Primary sources and toxicity of PAHs in Milwaukee-area streambed sediment

High concentrations of polycyclic aromatic hydrocarbons (PAHs) in streams can be a significant stressor to aquatic organisms. To understand the likely sources and toxicity of PAHs in Milwaukee-area streams, streambed sediment samples from 40 sites and parking lot dust samples from 6 sites were analyzed for 38 parent PAHs and 25 alkylated PAHs....

Baldwin, Austin K.; Corsi, Steven R.; Lutz, Michelle A.; Ingersoll, Christopher G.; Dorman, Rebecca A.; Magruder, Christopher; Magruder, Matthew

Attribution: [Columbia Environmental Research Center, Idaho Water Science Center, , Upper Midwest Environmental Sciences Center, Upper Midwest Water Science Center, Water Resources, United States of America](#)



Year Published: 2016

Coal-tar-based pavement sealcoat—Potential concerns for human health and aquatic life

Introduction Sealcoat is the black, viscous liquid sprayed or painted on many asphalt parking lots, driveways, and playgrounds to protect and enhance the appearance of the underlying asphalt. Studies by the U.S. Geological Survey (USGS), academic institutions, and State and local agencies have identified coal-tar-based pavement sealcoat as a major...

Mahler, Barbara; Woodside, Michael D.; Van Metre, Peter C.
Attribution: [Water Resources](#), [National Water Quality Program](#)

[View Citation](#) ✓



Year Published: 2015

Acute toxicity of runoff from sealcoated pavement to *Ceriodaphnia dubia* and *Pimephales promelas*

Runoff from coal-tar-based (CT) sealcoated pavement is a source of polycyclic aromatic hydrocarbons (PAHs) and N-heterocycles to surface waters. We investigated acute toxicity of simulated runoff collected from 5 h to 111 days after application of CT sealcoat and from 4 h to 36 days after application of asphalt-based sealcoat containing about...

Mahler, Barbara; Ingersoll, Christopher G.; Van Metre, Peter C.; Kunz, James L.; Little, Edward E.

Attribution: [Texas Water Science Center](#), [Water Resources](#), [Region 6: Arkansas-Rio Grande-Texas-Gulf](#)



Year Published: 2015

Exposure to runoff from coal-tar-sealed pavement induces genotoxicity and impairment of DNA repair capacity in the RTL-W1 fish liver cell line

Coal-tar-based (CTB) sealcoat, frequently applied to parking lots and driveways in North America, contains elevated concentrations of polycyclic aromatic hydrocarbons (PAHs) and related compounds. The RTL-W1 fish liver cell line was used to investigate two endpoints (genotoxicity and DNA-repair-capacity impairment) associated with exposure to...

Kienzler, Aude; Mahler, Barbara; Van Metre, Peter C.; Schweigert, Nathalie;

Devaux, Alain; Bony, Sylvie

Attribution: [Texas Water Science Center](#), , [Water Resources](#), , [Region 6: Arkansas-Rio Grande-Texas-Gulf](#)



Year Published: 2014

Concentrations of polycyclic aromatic hydrocarbons (PAHs) and azaarenes in runoff from coal-tar- and asphalt-sealcoated pavement

Coal-tar-based sealcoat, used extensively on parking lots and driveways in North America, is a potent source of PAHs. We investigated how concentrations and assemblages of PAHs and azaarenes in runoff from pavement newly sealed with coal-tar-based (CT) or asphalt-based (AS) sealcoat changed over time. Samples of simulated runoff were collected...

Mahler, Barbara; Van Metre, Peter C.; Foreman, William T.

Attribution: [Texas Water Science Center](#), , [Water Resources](#), , [Region 6: Arkansas-Rio Grande-Texas-Gulf](#)

[View Citation](#) ✓



Year Published: 2014

From streets to streams: Assessing the toxicity potential of urban sediment by particle size

Urban sediment can act as a transport mechanism for a variety of pollutants to move towards a receiving water body. The concentrations of these pollutants oftentimes exceed levels that are toxic to aquatic organisms. Many treatment structures are designed to capture coarse sediment but do not work well to similarly capture the fines. This study...

Selbig, William R.; Roger T. Bannerman; Corsi, Steven

Attribution: , [Upper Midwest Environmental Sciences Center](#), [Upper Midwest Water Science Center](#), [Water Resources](#)



Year Published: 2013

PAH concentrations in lake sediment decline following ban on coal-tar-based pavement sealants in Austin, Texas

Recent studies have concluded that coal-tar-based pavement sealants are a

major source of polycyclic aromatic hydrocarbons (PAHs) in urban settings in large parts of the United States. In 2006, Austin, TX, became the first jurisdiction in the U.S. to ban the use of coal-tar sealants. We evaluated the effect of Austin's ban by analyzing PAHs in...

Van Metre, Peter C.; Mahler, Barbara

Attribution: [Texas Water Science Center](#), , [Water Resources](#), , [Region 6: Arkansas-Rio Grande-Texas-Gulf](#)

[View Citation](#) ✓



Year Published: 2013

You're standing on it! Coal-tar-based pavement sealcoat and environmental and human health

Coal-tar-based sealcoat—a product marketed to protect and beautify asphalt pavement—is a potent source of polycyclic aromatic hydrocarbons (PAHs) to air, soils, streams and lakes, and homes. Does its use present a risk to human health? Results from a new study by researchers from Baylor University and the USGS indicate that living...

Mahler, Barbara; Van Metre, Peter C.

Attribution: [Texas Water Science Center](#), [Water Resources](#), , [Region 6: Arkansas-Rio Grande-Texas-Gulf](#)



Year Published: 2012

Cancer risk from incidental ingestion exposures to PAHs associated with coal-tar-sealed pavement

Recent (2009-10) studies documented significantly higher concentrations of polycyclic aromatic hydrocarbons (PAHs) in settled house dust in living spaces and soil adjacent to parking lots sealed with coal-tar-based products. To date, no studies have examined the potential human health effects of PAHs from these products in dust and soil. Here we...

Williams, E. Spencer; Mahler, Barbara; Van Metre, Peter C.

Attribution: [Texas Water Science Center](#), , [Water Resources](#), , [Region 6: Arkansas-Rio Grande-Texas-Gulf](#)

[View Citation](#) ✓



Year Published: 2012

Coal-tar pavement sealants might substantially increase children's PAH exposures

Dietary ingestion has been identified repeatedly as the primary route of human exposure to polycyclic aromatic hydrocarbons (PAHs), seven of which are classified as probable human carcinogens (B2 PAHs) by the U.S. EPA. Humans are exposed to PAHs through ingestion of cooked and uncooked foods, incidental ingestion of soil and dust, inhalation of...

Williams, E. Spencer; Mahler, Barbara; Van Metre, Peter C.

Attribution: [Texas Water Science Center](#), , [Water Resources](#), , [Region 6: Arkansas-Rio Grande-Texas-Gulf](#)

[View Citation](#) ✓



Year Published: 2012

PAH volatilization following application of coal-tar-based pavement sealant

Coal-tar-based pavement sealants, a major source of PAHs to urban water bodies, have recently been identified as a source of volatile PAHs to the atmosphere. We tracked the volatilization of PAHs for 1 year after application of a coal-tar-based pavement sealant by measuring gas-phase PAH concentrations above the pavement surface and solid-phase...

Van Metre, Peter C.; Majewski, Michael S.; Mahler, Barbara; Foreman, William T.; Braun, Christopher L.; Wilson, Jennifer T.; Burbank, Teresa L.

Attribution: [Texas Water Science Center](#), , [Water Resources](#), , [Region 6: Arkansas-Rio Grande-Texas-Gulf](#)

[View Citation](#) ✓

Below are data or web applications associated with this project.

Date published: JANUARY 1, 2019



Estimating the presence of paved surface parking lots in the conterminous U.S. from land-use coefficients for 1974, 1982, 1992, 2002, and 2012

Parking lots may be a significant source of pollution. Oil, sediments, and heavy metals may accumulate on their surface, then be flushed into rivers, streams, and lakes via rainfall. At present no dataset provides a mapping or estimation of parking lot area or locations nationwide. This product consists of a time series of five national 60-meter raster datasets which estimate the propo

Attribution: [National Water Quality Program](#)

The USGS produces many types of multimedia products. Use the links below to browse our offerings of photographs, podcasts, and videos related to coal-tar sealant, PAHs, and environmental health.



JUNE 19, 2014

PAHs/Coal Tar Sealants Effects on Environment & Human Health

Webinar on USGS research findings on Polycyclic Aromatic Hydrocarbons (PAH) contamination associated with coal-tar-based sealants and implications for environmental and human health. Dr. Spencer Williams explains how these sealants are an important source of PAH exposure for children in affected environments, and may create excess cancer risk for persons who live in these

...

Attribution: [Environmental Health](#)



AUGUST 16, 2012

Basketball court sealed with coal-tar sealcoat

Coal-tar-based pavement sealcoat, used here on a basketball court, is a potent source of polycyclic aromatic hydrocarbons (PAHs) to the environment. Coal-tar-based sealcoat products typically are 20-35% coal-tar pitch, a known human carcinogen. PAH-rich sealcoat particles can be tracked indoors, where they become incorporated into house dust.

...

Attribution: [National Water Quality Program](#)



AUGUST 23, 2011

Testing Coal-Tar Sealcoats for Toxic PAH Emissions

A USGS scientist adjusts an air pump used to measure emission of polycyclic aromatic carbons (PAHs) into the air.



AUGUST 23, 2011

Testing Coal-Tar Sealcoats for Toxic PAH Emissions

A professional applicator applies coal-tar-based sealcoat to a test plot used to measure emission of polycyclic aromatic carbons (PAHs) into the air.



AUGUST 23, 2011

Testing Coal-Tar Sealcoats for Toxic PAH Emissions

USGS scientists prepare a sampler used to measure emission of polycyclic aromatic carbons (PAHs) into the air.

AUGUST 16, 2011

Paint it Black

Pete Van Metre and Barbara Mahler discuss an experiment to assess release of Polycyclic Aromatic Hydrocarbons (PAHs) from coal tar pavement sealant after application on a parking lot. (Short Version)

Attribution: [Environmental Health](#)



JULY 30, 2010

Sealed parking lot with wear marks from snowplow

Once applied, sealcoat can be abraded by snowplows, as evidence here, or the abrasive action of car tires. Runoff carrying high-PAH sealcoat particles flows into storm drains, where it can be transported to streams and lakes. Runoff from coal-tar-sealcoated pavement contains extremely high concentrations of polycyclic aromatic hydrocarbons (PAHs), and is toxic to aquatic

...

Attribution: [Water Resources, National Water Quality Program, Region 2: South Atlantic-Gulf \(Includes Puerto Rico and the U.S. Virgin Islands\)](#)



JULY 30, 2010

Sealcoated parking lot and storm drain

Runoff from this sealcoated lot will flow into the storm drain, where it will be transported to streams and lakes. Runoff from coal-tar-sealcoated pavement contains extremely high concentrations of polycyclic aromatic hydrocarbons (PAHs), and is toxic to aquatic life. [Read more](#)

...

Attribution: [Water Resources, National Water Quality Program, Region 2: South Atlantic-Gulf \(Includes Puerto Rico and the U.S. Virgin Islands\)](#)



JULY 29, 2010

Sealcoated pavement and storm drain

Runoff from this sealcoated lot will flow into the storm drain, where it will be transported to streams and lakes. Runoff from coal-tar-sealcoated pavement contains extremely high concentrations of polycyclic aromatic hydrocarbons (PAHs), and is toxic to aquatic life. [Read more](#)

...

Attribution: [Water Resources, National Water Quality Program](#)



JULY 29, 2010

Sealcoated parking lot

Sealcoated parking lot. Runoff from coal-tar-sealcoated pavement contains extremely high concentrations of polycyclic aromatic hydrocarbons (PAHs), and is toxic to aquatic life. Read more [here](#).

Attribution: Water Resources, National Water Quality Program, Region 2: South Atlantic-Gulf (Includes Puerto Rico and the U.S. Virgin Islands)



JULY 29, 2010

Sealcoated lot and adjacent storm drain

Runoff from this sealcoated lot will flow into the storm drain, where it will be transported to streams and lakes. Runoff from coal-tar-sealcoated pavement contains extremely high concentrations of polycyclic aromatic hydrocarbons (PAHs), and is toxic to aquatic life. Read more

...

Attribution: Water Resources, National Water Quality Program, Region 2: South Atlantic-Gulf (Includes Puerto Rico and the U.S. Virgin Islands)



JANUARY 11, 2010

A Potent Pollutant is Tracked Indoors

Carcinogenic compounds in a popular pavement sealer are tracked indoors, where they show up in high concentrations in house dust.

Listen as USGS hydrologist Barbara Mahler explains how she and her team identified the link between polycyclic aromatic hydrocarbons in coal-tar-based pavement sealcoat and house dust.

Coal-tar sealant may protect roads, but it is problematic for people's health. Here are some news stories that address the toxicity of runoff waters from sealed roads.



Date published: MAY 8, 2019

Estimates of areal extent of U.S. parking lots now available

Parking lots may be a significant source of pollution, but up until now there has been no quantitative estimate of the areal extent of parking lots in the U.S.

Attribution: [Water Resources](#), [National Water Quality Program](#)



Date published: DECEMBER 22, 2016

Coal-Tar-Sealant a Major Source of PAH Contamination in Milwaukee Streams

Attribution: [Environmental Health](#), [Water Resources](#), [States and Territories](#), [Region 3: Great Lakes](#), [Upper Midwest Water Science Center](#)



Date published: APRIL 13, 2015

Coal-Tar-Sealant Runoff Causes Toxicity and DNA Damage

Runoff from pavement with coal-tar-based sealant is toxic to aquatic life, damages DNA, and impairs DNA repair, according to two studies by the U.S. Geological Survey published in the journals *Environmental Science and Technology* and *Science of the Total Environment*.

Attribution: [Environmental Health](#)



Date published: JUNE 16, 2014

Austin Coal-Tar Sealant Ban Leads to Decline in PAHs

The 2006 prohibition on the use of coal-tar-based pavement sealants in Austin, Texas, has resulted in a substantial reduction in polycyclic aromatic hydrocarbons (PAHs), according to a new study by the U.S. Geological Survey.

Attribution: [States and Territories](#), [Region 6: Arkansas-Rio Grande-Texas-Gulf](#)



Date published: MARCH 28, 2013

Proximity to Coal-Tar-Sealed Pavement Raises Risk of Cancer, Study Finds

People living near asphalt pavement sealed with coal tar have an elevated risk of cancer, according to a study in the journal Environmental Science and Technology. Much of this calculated excess risk results from exposures in children, age six or younger, to polycyclic aromatic hydrocarbons (PAHs) from the sealant.



Date published: FEBRUARY 13, 2012

Coal-Tar Sealcoat a Major Source of PAHs to Air and to Children Living Nearby

Four new reports examine the contaminants polycyclic aromatic hydrocarbons (PAHs) found in house dust, streams, lakes, soil, and air



Date published: DECEMBER 1, 2010

Coal Tar Sealant Largest Source of PAHs in Lakes

Coal-tar-based pavement sealant is the largest source of polycyclic aromatic hydrocarbons (PAHs) found in 40 urban lakes studied by the U.S. Geological Survey.