

Questionnaire regarding MSNBC Article-Study Sees parking lot dust as a cancer hazard

Article dated: January 12, 2010

Author: Robert McClure-Investigate West

Link to story: <http://www.msnbc.msn.com/id/34809699>

Link to Investigate West's website: <http://invw.org/>

Background:

The above mentioned article reported on a USGS Settled House Dust (SHD) study that claimed that there was an increased cancer risk using refined tar based pavement sealers vs. no sealer or an asphalt based pavement sealer. The study contained numerous flaws which were further compounded by the obvious reporter's bias since only one side of the story was told. This questionnaire is an attempt to correct all inaccuracies either by USGS or the reporter.

In the article the term coal tar sealant is used frequently. This term is incorrect and will be referred to as refined tar based pavement sealer from this point forward.

1) Question: Is refined tar based pavement a waste product of the steel industry?

Answer: **This is false.** This statement originates from the following study:

Coal-Tar based pavement sealant toxicity to freshwater macroinvertebrates: Pamela Bryer, Mateo Scoggins and Nancy McClintock. Environmental Pollution, 2009.

Link:

http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6VB5-4XNVTGM-4&_user=10&_coverDate=11%2F12%2F2009&_rdoc=1&_fmt=high&_orig=search&_sort=d&_docanchor=&_view=c&_searchStrId=1254244248&_rerunOrigin=google&_acct=C00050221&_version=1&_urlVersion=0&_userid=10&md5=ece497a7d31f9cf915392f0aea2f7d2e#FCANote

Which states; "Coal tar is a hazardous waste byproduct of the coking of coal and is a frequent waste product in steel and electric industries

(ATSDR 1996). Currently, coal-tar byproducts is recycled into products that are presumably relatively inert, such as pavement sealants, therefore avoiding hazardous waste disposal issues described by the Resource Conservation and Recovery Act , RCRA, (40 CFR 261.31 and 40 CFR 261.32)(ATSDR 1996)"(page 1) is filled with numerous inaccuracies. First, Refined tar-based pavement sealer is made from refined tar, not coal tar. Second, crude coal tar is not a hazardous waste byproduct. It is a crude product that is further refined into other products. Much in the same way that crude oil is refined into other petroleum based products. Third, the authors used the ATSDR Toxicological Profile for Creosote (a wood preservative which is a refined tar-based product) and is no way similar to refined tar. In addition, when consulting the Toxicological Profile that was referenced by the study, the above mention statements were not contained within the profile in any way in that document. Refined tar is not a recycled product to avoid EPA's hazardous waste laws. This is an example how COA is attempting to support a preconceived notions about refined tar and refined tar-based sealer.

2) Question: Is refined tar based pavement sealer is used in all 50 states?

Answer: This statement is false. This statement was first seen in the USGS study:

Van Metre, Mahler and Wilson, 2009. **PAHs Underfoot: Contaminated Dust from Coal-Tar Sealcoated Pavement is Widespread in the United States.** ES&T: 43: (1) 20-25.

<http://pubs.acs.org/doi/abs/10.1021/es802119h>

The vast majority of refined tar based sealer is typically east of the Continental Divide, not in all 50 states as the USGS author's claim. In addition in subsequent studies, this statement has reappeared again and again.

3) Question: Crude coal tar is known to cause cancer in humans. That finding dates back to the 1770s when chimney sweeps in London were found to have high levels of scrotal cancer.

Answer: The reference to the chimney sweep study pertains to occupational exposure to chimney soot (also know as creosote, the same name used for the coal tar derived wood preservative). These two creosotes are not related and cannot used as a comparative study.

4) Question: Is there emerging evidence also suggests that babies exposed to PAHs while in the womb may have lowered IQs? Is coal tar carcinogenic?

Answer: As of this moment, **there is exactly one study that has suggested that PAHs may lower a child's IQ.**

Prenatal Airborne Polycyclic Aromatic Hydrocarbon Exposure and Child IQ at Age 5 Years. Frederica P. Perera, Zhigang Li, Robin Whyatt, Lori Hoepner, Shuang Wang, David Camann, and Virginia Rauh. *Pediatrics*, published online July 20, 2009.

Link:

<http://pediatrics.aappublications.org/cgi/content/abstract/124/2/e195>

Of the over 100 PAHs that exist in the environment, only seven are classified by EPA (2010) as **probable human carcinogens (Group 2B)**. **Refined Tar Based Sealers are not the only source of these seven PAHs, as the other possible sources of PAHs in the environment also contain these seven Group 2B PAHs.** Although studies in humans do not adequately demonstrate that the seven PAHs mention are responsible for inducing carcinogenicity, there is sufficient animal data demonstrating carcinogenicity.

5) Question: The article and USGS study regarding Settled House Dust and refined tar based pavement sealer, makes it appear that this product could be harmful to my health? Is this true?

Answer:

This is false in many different ways. First, let's address the USGS study.

Coal-Tar-Based Parking Lot Sealcoat: An Unrecognized Source of PAH to Settled House Dust. Barbara J. Mahler, Peter C. Van Metre, Jennifer T. Wilson, MaryLynn Musgrove, Teresa L. Burbank, Thomas E. Ennis, Thomas J. Bashara. *Environmental Science & Technology* 2010 44 (3), 894-900

Link: <http://pubs.acs.org/doi/abs/10.1021/es902533r>

Refer to document entitled "Executive Summary-PCTC Review of USGS Dust Study May 3, 2010" for a comprehensive look at flaws associated with this study.

6) Question: Was there really 59 million gallons of refined tar based pavement sealer applied in Texas in 2009 like the article claims?

Answer:

This statement is false. That number has no basis behind it and is a gross overestimate of the actual number.

7) Question: Did local governments such as Austin, TX, Madison, Wisconsin and Washington, DC banned refined tar based pavement sealer based up after finding tar based pavement sealer in their watershed?

Answer:

That statement is false for all three local governments but let's look at the situation at each location:

Austin, TX-This was the first city that first put out the theory that refined tar based pavement sealer was a major contributor to PAHs in the watershed. The City and USGS put out several studies with this being the major theme. **In a recent presentation, a representative from the City of Austin Watershed Protection Department admitted that the ban was in effect for a precautionary measure. The City of Austin does have a precautionary principle that they do utilize for environmental policy decisions.** For those people that are not familiar with what the precautionary principle is, a brief explanation is given below:

The precautionary principle states that:

"When an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically. In this context the proponent of an activity, rather than the public, should bear the burden of proof. The process of applying the precautionary principle must be open, informed and democratic and must include potentially affected parties. It must also involve an examination of the full range of alternatives, including no action." - [Wingspread Statement](#) on the Precautionary Principle, Jan. 1998

Source: <http://www.sehn.org/precaution.html>

The short version of the above statement is if there is a belief that an activity or product is harmful to the environment or human health, that activity or product should be banned until it can be proved that that product or activity is "deemed safe".

There are state and local governments that are adopting precautionary statements as part of health or environmental legislation or these government bodies using precautionary statements as an informal policy.

Madison, Wisconsin-This was the second city to enact a ban of refined tar based pavement sealer. Their ban was enacted with very little input from industry. Also, as of this date, no sediment testing has not identified refined tar based pavement sealer as being a contaminant in any of their watersheds. **Dane County, WI (which The City of Madison is in) does have a precautionary principle statement that they utilize for their environmental policies.**

Washington, DC- Effective July 1, 2009, The District of Columbia banned the sale and use of refined tar-based pavement sealer. This decision was made without any input from industry or the Pavement Coatings Technology Council (PCTC). Prior to the ban, the District of Columbia commissioned a study to look at PAH sediment contamination in the Anacostia River (see link below). **In this study, refined tar-based pavement sealer was not even mentioned as a source of PAHs. The District of Columbia decided to ignore the study and ban sealer anyway without any proof that refined tar based pavement sealer was the source of the problem.**

Link: **Characterization of polycyclic aromatic hydrocarbons in urban stormwater runoff flowing into the tidal Anacostia River, Washington, DC, USA.** Hwang and Foster-2006.

[doi:10.1016/j.envpol.2005.08.003](https://doi.org/10.1016/j.envpol.2005.08.003)

In communications between Pavement Coating Technology Council and The District of Columbia, the District listed the scientific literature utilized to make their decision. 70% of the literature listed was authored by The City of Austin or the same authors of the USGS Refined Tar Based Sealer studies.

◦One of the other studies listed was from The New York Academy of Science. **In this study, refined tar based pavement sealer was not**

listed as the major source of PAHs in the NJ/NY watershed, transportation-related activity was shown to contribute the majority of PAHs into the watershed. In a recent NYAS study in which a mass balance of PAHs in the NY/NJ Harbor were examined (NYAS 2010). In this analysis, refined tar based pavement sealer was not listed as a source of PAHs to the harbor.

◦The final study listed by the district looks at tumor prevalence in Brown Bullheads from the Tidal Potomac River Watershed. In this study, about half Brown Bullheads from the Anacostia River had some sort of liver tumor which claims to be due to contaminate exposure. The study attributes these tumors to average PAH content in Anacostia river sediment to be over nine fold increase over West Coast NOAA study PAH limits. The study further explains that PAHs in the Anacostia River are derived from both petroleum and combustion of petroleum products.

At this time, The District of Columbia has not produced any evidence that they performed any studies on their own (other than funding the Hwang study) to determine for themselves if they indeed have a problem with excessive PAHs in watershed sediment and if the origin is refined tar based pavement sealer.

One could make the argument that perhaps that The District of Columbia is utilizing a precautionary stance with regards to refined tar pavement sealers. By taking a precautionary principle approach to control PAHs, The District banned the refined tar based sealer on the belief that it could harm the environment. The Pavement Coating Technology Council was never afforded an opportunity to offer opposing studies that show that the City of Austin (COA) and USGS are flawed and that PCTC studies show that Refined Tar Based Sealer is not a major contributor of PAHs in a watershed.

8) Question: Are PAHs are toxic to mammals (including humans) birds, fish, amphibians and invertebrates

Answer:

The overall answer to this question is no. Specifics are listed below.

Background information on PAHs:

Polycyclic aromatic hydrocarbons are also known as polycyclic aromatic compounds, polycyclic aromatic hydrocarbons or as polynuclear aromatics. PAHs are a group of over 100 different chemicals consisting of carbon and hydrogen in fused-ring structures.

PAHs are very common in the environment (ATSDR-Barton Springs Health Consultation 2003). *Polycyclic aromatic hydrocarbons are found in coal and petroleum, but they are also products of incomplete combustion, of either natural or anthropogenic (man-made) origin. Anthropogenic (man-made) sources to the environment are more abundant than natural sources and include burning of wood, coal, oil and gas, garbage, or other organic substances like tobacco or charbroiled meat. The most important natural sources are forest fires and volcanoes (National Research Council, 1983). PAHs are generally found as complex mixtures, not as single compounds. Because PAHs are so common in the environment, people are exposed to them daily (ATSDR 2003).*

For U.S. residents, the greatest PAH exposure is through the ingestion of food, but this can vary depending on lifestyle (Agency for Toxic Substance and Disease Registry, 1995). The most common sources of exposure to PAHs are tobacco smoke, food, wood smoke and ambient air (ATSDR 2003). Exposure to PAHs via inhalation is estimated to range from .02 to 3 micrograms per day. Smoking one pack of unfiltered cigarette per day increases this estimate by an additional 2 to 5 micrograms per day. People that smoke three packs of cigarette per day increase their exposure by an estimated 6 to 15 micrograms per day. The intake of carcinogenic PAHs from the average American diet has been estimated to range from 1 to 5 micrograms per day, mostly from the ingestion of unprocessed grains and cooked meats. The dietary estimate increases to 6 to 9 micrograms per day for those individuals who eat large amounts of meat (ATSDR 2003). The WHO (1998) notes that while PAHs may be found on fruits and vegetables due to atmospheric disposition and/or due to food processing such as frying and roasting, the highest levels of PAHs have been found in smoked meat (over 100 parts per billion) and fish (up to 86 parts per billion).

Of the over 100 PAHs that exist in the environment, only seven are classified by EPA (2010) as probable human carcinogens (Group 2B). Refined Tar Based Sealers are not the only source of these seven PAHs as the other sources of PAHs, as the other possible sources of PAHs in the environment also contain these seven PAHs. Although studies in humans do not adequately demonstrate that the seven PAHs mentioned are responsible for inducing carcinogenicity, there is sufficient animal data demonstrating carcinogenicity.

As in the background information, every person is exposed to PAHs daily. Every person ingests carcinogenic PAHs daily. There are certain PAHs which are more toxic than others. One thing to stress is that The

City of Austin and USGS (same authors) continually state that refined tar based pavement sealers are a major contributor of PAHs into watersheds. There are literally hundreds of studies which state that combustion sources are the primary contributor of PAHs into watershed. PCTC research has shown that COA and USGS are flawed in many areas and therefore their hypothesis is incorrect.

Information about City of Austin Amphibian Studies

The Effects of Coal Tar Based Pavement Sealer on Amphibian Development and Metamorphosis; Pamela Bryer, Jan Elliott and Emily Willingham. *Ecotoxicology*, 15, 241-247, 2006.

Link: <http://www.springerlink.com/content/25477n7h225v2843/>

There are several problems with this study:

-Selected doses were well above known lethal levels. The outcomes were pre-determined by design.

-These studies did not meet scientific standards requiring description of materials used such as source of test material was not disclosed and lack of full chemical characterization precludes repeat of experiment by others.

-The focus of the study is designed around the notion that elevated concentrations of refined tar-based sealant pose a risk to amphibians and no other source of PAHs would have the same effect.

-The authors further obscure the facts by comparing refined tar-based sealer to coal smoke and from chimney soot.

Occurrence of polycyclic aromatic hydrocarbons below coal-tar-sealed parking lots and effects on stream benthic macroinvertebrate communities:

Mateo Scoggins, Nancy McClintock, L. Gosselink and Pamela Bryer. *Journal of North American Benthological Society*, 2007, 26(4): 694-707.

Link: <http://jnabs.allenpress.com/jnabsonline/?request=get-abstract&issn=0887-3593&volume=026&issue=04&page=0694>

-“We attempted to identify the sources of PAH in the sediment of our study streams using ratio methods, but we were unsuccessful and

found no significant clustering of field data with known source data" (page 702).

-“Our inability to associate PAH contamination in our study streams with coal-tar sealant might have been because we analyzed on the 16 EPA priority PAHs in field sediments or because of extensive weathering and mixing with other materials as the coal-tar sealant abrades and moves from parking lot to stream systems”(page 702).

-The authors assumed that any “high” PAHs could only be refined tar-based sealer based and nothing else. Any other source of PAHs would be considered “background” and of no consequence to the study.

Coal-Tar based pavement sealant toxicity to freshwater macroinvertebrates: Pamela Bryer, Mateo Scoggins and Nancy McClintock. Environmental Pollution, 2009.

Link:

http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6VB5-4XNVTGM-4&_user=10&_coverDate=11%2F12%2F2009&_rdoc=1&_fmt=high&_orig=search&_sort=d&_docanchor=&_view=c&_searchStrId=1254244248&_rerunOrigin=google&_acct=C000050221&_version=1&_urlVersion=0&_userid=10&md5=ece497a7d31f9cf915392f0aea2f7d2e#FCANote

- Selected doses were well above known lethal levels. The outcomes were pre-determined by design. It is interesting to note that the low and medium dosing of PAHs, the number of organisms and species richness (abundance) either increased or remained the same when compared with the control group (page 3).

-These studies did not meet scientific standards requiring description of materials used such as source of test material was not disclosed and lack of full chemical characterization precludes repeat of experiment by others.

-The study mentions a link between refined tar-based pavement sealer and PAHs in sediments of urban water bodies. The references given were Van Metre and Mahler-USGS and Scoggins-COA. The authors want to give you the impression that the science is settled, where that could not be further from the truth (page 1).

-This study claims that refined tar-based pavement sealers may be contributing a large portion of the PAH loading seen in urban stream sediments (page 1).

-The statement "Coal tar is a hazardous waste byproduct of the coking of coal and is a frequent waste product in steel and electric industries (ATSDR 1996). Currently, coal-tar byproducts is recycled into products that are presumably relatively inert, such as pavement sealants, therefore avoiding hazardous waste disposal issues described by the Resource Conservation and Recovery Act , RCRA, (40 CFR 261.31 and 40 CFR 261.32)(ATSDR 1996)"(page 1) is filled with numerous inaccuracies. First, Refined tar-based pavement sealer is made from refined tar (see Coal Tar and PAHs section of this site). **Second, crude coal tar is not a hazardous waste byproduct.** It is a crude product that is further refined into other products. Much in the same way that crude oil is refined into other petroleum based products. Third, the authors used the ATSDR Toxicological Profile for Creosote (a wood preservative which is a refined tar-based product) and is no way similar to refined tar. In addition, when consulting the Toxicological Profile that was referenced by the study, the above mention statements were not contained within the profile in any way in that document. Refined tar is not a recycled product to avoid EPA's hazardous waste laws. This is an example how COA is attempting to support a preconceived notions about refined tar and refined tar-based sealer (page 1).

-In the high dose PAH experiment; somehow there was a decrease in total PAH by almost 15% from start of the experiment to the end of the experiment.

One item that is not frequently mentioned by COA is that TCEQ (Texas Commission on Environmental Quality) completed a study:

TCEQ: Barton Springs Pool Sediment Toxicity Evaluation to Aquatic Life-May 28, 2003

Link:

http://www.tceq.state.tx.us/implementation/tox/barton/BSPFull_PDF.html/at_download/file

To summarize TCEQ's study:

-Toxicity testing was performed using standard EPA and ASTM protocols (page 1).

-Numerical standards have not been adopted for contaminants in sediments. Since this is the case, sediment screening levels used included those developed by NOAA, TCEQ's Surface Water Quality Monitoring and those from TCEQ's Ecological Risk Assessment Program (page 2).

-"With few exceptions, the results of the physico-chemical analyses of Barton Springs Pool sediment (combined with the water column data from previous samplings) indicate that the quality of the pool is better than expected from typical water bodies in urbanized areas" (page 4).

-"However, recent studies indicate that because PAHs are nearly always found in the environmental as mixtures, they should be evaluated as such" (page 4).

-"In the interim, a total PAH number of 12.2 mg/kg (ppm) has been recommended for the protection of benthic invertebrates in freshwater sediments (page 4).

-"Since none of the samples exceeded the recommended value of 12.2 mg/kg (ppm), and because some of the samples contained lower concentrations of total PAHs that the two samples that were not different from the control, it is unlikely that PAHs caused the sublethal effects to Hyalella (page 4).

-"There were no lethal effects observed to either species of test organisms compared to their respective controls".

-Recommendations: "Although growth effects to once (i.e., Hyalella) of two test species were observed, based on discussions with EPA about the lack of mortality in either organism, the lack of growth effects to the other test organism (i.e., Chironomus), and the lack of correlation between the physico-chemical data and the Hyalella growth effects, the evidence suggest that the aquatic life use in Barton Springs is not impaired by sediment toxicity. The pool should not be placed on the State's 303(d) list for ambient sediment toxicity but the growth effects observed in the tests with Hyalella do warrant continued contamination monitoring and toxicity testing"(page 5).

The reason for mentioning that flaws of the studies by COA and USGS is because it does draw attention from the real problem of being able to control man made PAHs into the environment. PCTC is working towards tightening controls over application of refined tar based sealer to do as much as possible to help the environment.

9) Question: In the article, it mentions that fingerprinting of lake sediment is expected to complete with a couple of months. How could this be since the USGS studies have maintained that fingerprinting has been done with all of their studies?

Answer:

This statement is counter to all of the claims made by the USGS studies where they claim that chemical fingerprinting was completed with the study to back up their claim that refined tar based sealer is a major contributor to PAHs to watersheds. Which one is it?

Question: Peter Van Metre from USGS claims that the “poster child” community may be Village of Lake in the Hills, Ill since PAH pollution levels went up tenfold? What would cause that?

According to the village records, the population of the village increased almost 400% from 1990 to 2006.

This information pertains to this study:

Trends in Hydrophobic Organic Contaminants in Urban and Reference Lake Sediments across the United States, 1970–2001. Peter C. Van Metre and, Barbara J. Mahler. *Environmental Science & Technology* 2005 39 (15), 5567-5574

Link: <http://pubs.acs.org/doi/abs/10.1021/es0503175>

This study states the following:

-42% of the lakes had an increasing trend in PAHs throughout the country, even in areas where refined tar based pavement sealer is not sold.

-Increasing trends occurred in lakes with urbanized watersheds.

-Study concluded that most increases coincided with urbanization and increases of vehicle traffic.

-There were increases in watershed that refined tar based sealer is not sold into.

-Refined tar based sealer was not mentioned as a source let alone as the majority source of PAHs in any of the watersheds.

It would appear that USGS is disputing their research.

Below is a podcast of Barbara Mahler, one of the authors of the USGS dust study. Pay close attention at the end of the podcast regarding her recommendations regarding resolution to tracking refined tar based pavement sealer into ones home.

An interview with USGS scientist Barbara Mahler can be heard in [episode 116](#) of the USGS CoreCast.

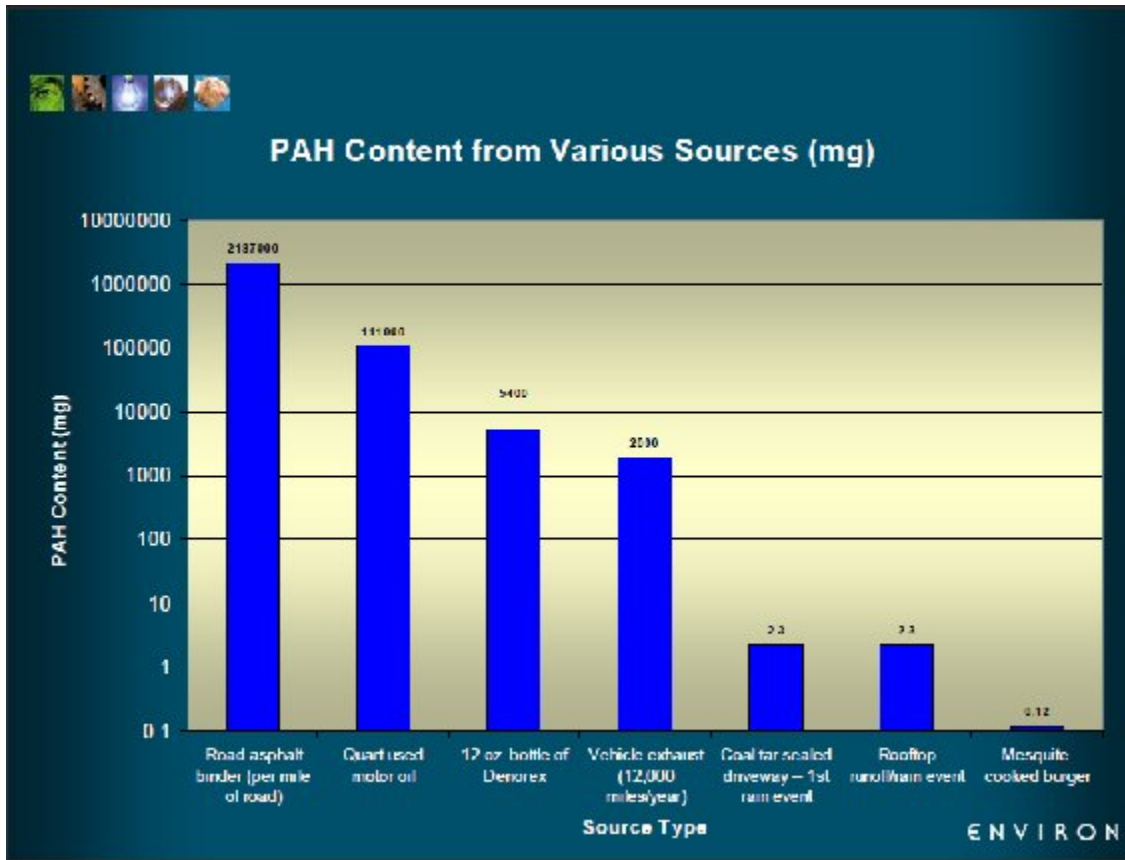
Link: <http://www.usgs.gov/corecast/details.asp?ep=116>

To put things into perspective, attached are three graphs which show:

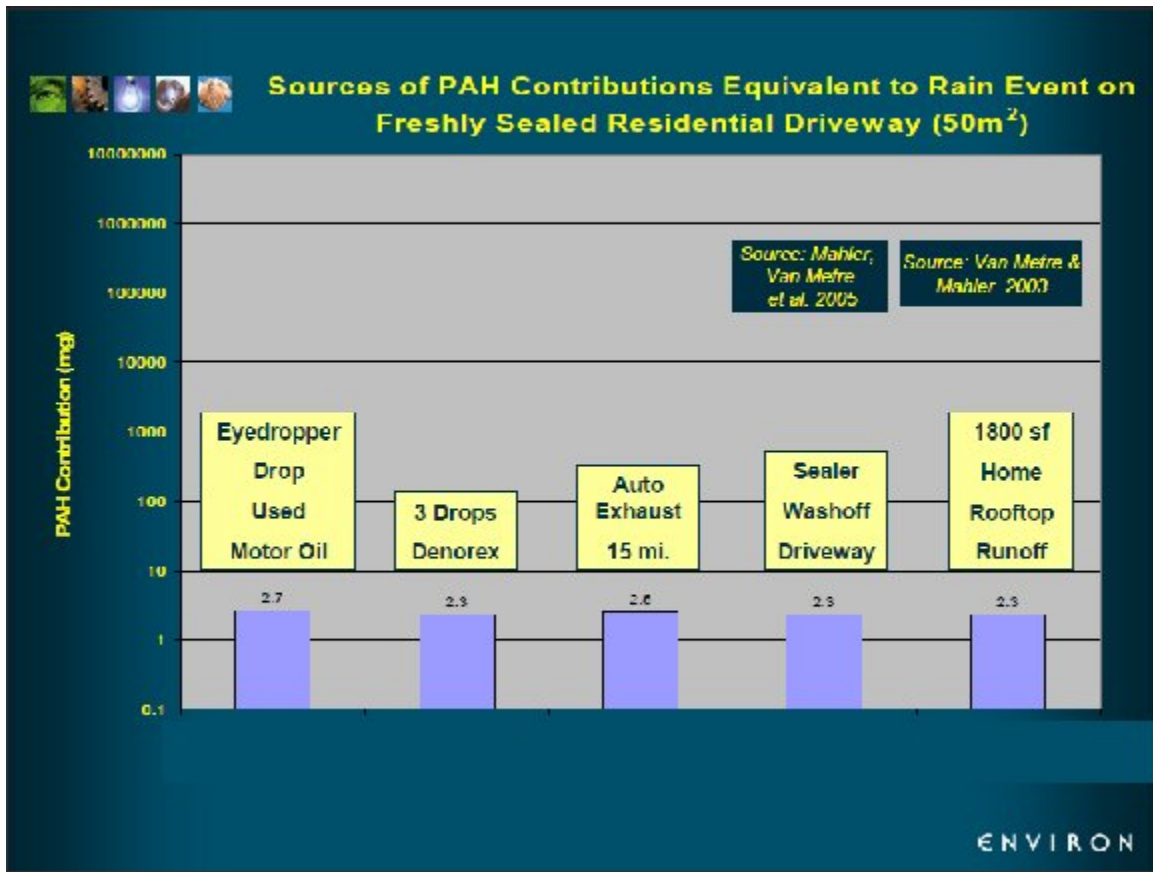
-Graph 1: PAH content from various sources

-Graph 2: Sources of PAH Contributions equivalent to rain events on freshly sealed residential driveway

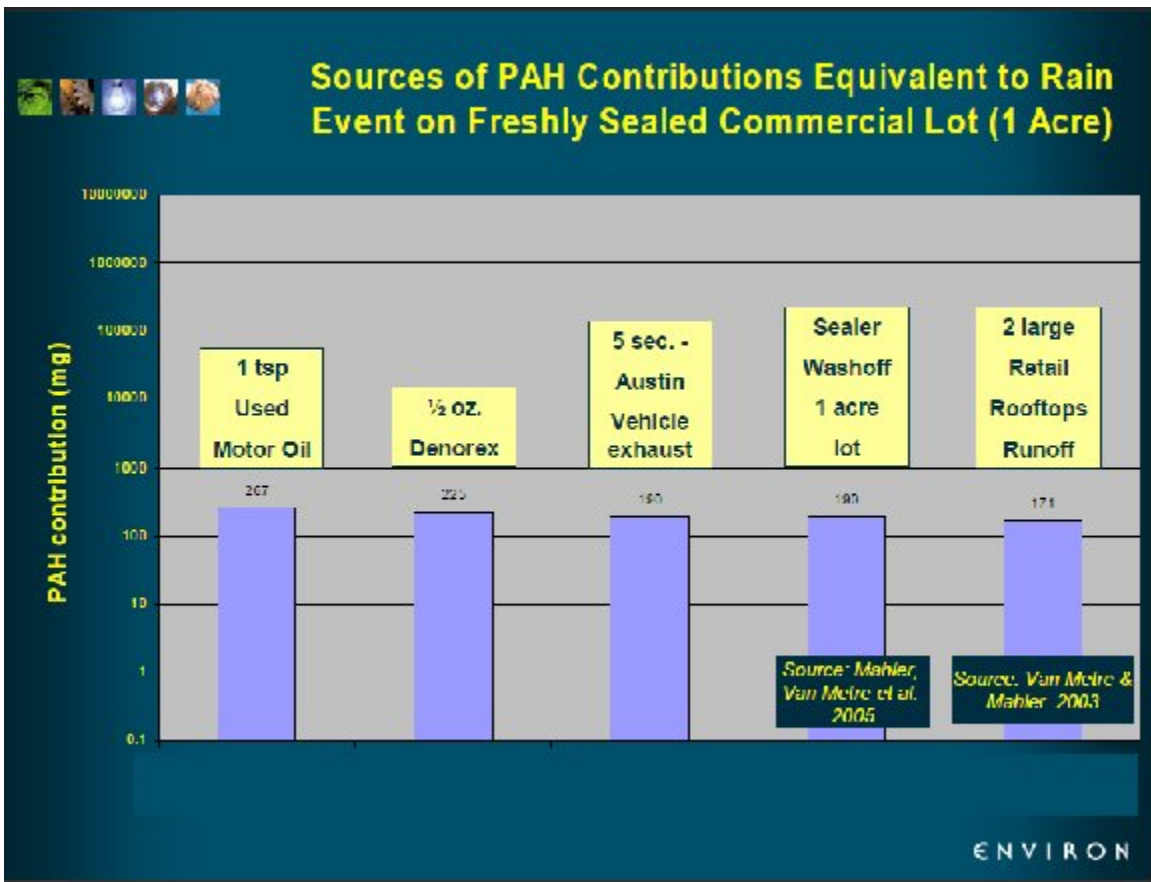
-Graph 3: Sources of PAH contributions equivalent to rain event on freshly sealed commercial lot (one acre):



Graph 1



Graph 2



Graph 3