

USE OF COAL TAR BASED ASPHALT SEALANTS AND POTENTIAL ENVIRONMENTAL IMPACTS

PRESENTED TO THE CITY COUNCIL COMMUNITY INVOLVEMENT COMMITTEE
DECEMBER 16, 2009



REVIEW OF ASPHALT SEALANTS AND PAH'S

- ASPHALT SEALANTS CAN BE CATEGORIZED INTO TWO TYPES — COAL TAR BASED AND ASPHALT BASED
- COAL TAR SEALANTS (CTS) CONTAIN APPROXIMATELY 3.4% TO 20% PAH'S AND ASPHALT SEALANTS CONTAIN 0.03 TO 0.66% (CITY OF AUSTIN)
- COAL TAR IS A BY-PRODUCT OF THE DISTILLATION OR BURNING OF COAL TO PRODUCE COKE OR GAS (STEEL PRODUCTION)
- POLYCYCLIC AROMATIC HYDROCARBONS (PAH'S) ARE A FAMILY OF CHEMICALS THAT ARE FOUND IN CRUDE OIL AND COAL DEPOSITS AND ARE ALSO FORMED BY THE INCOMPLETE COMBUSTION OF FUELS AND SUBSTANCES SUCH AS WOOD, COAL, DIESEL, FAT AND TOBACCO.
- SOME PAH'S HAVE BEEN DETERMINED TO BE HIGHLY CARCINOGENIC
- PAH'S ARE LISTED #8 ON THE CERCLA LIST OF MOST HAZARDOUS SUBSTANCES
- THE CITY'S MS4 STORMWATER PERMIT MANDATES THE CITY TO REDUCE THE DISCHARGE OF POLLUTANTS TO THE DRAINAGE SYSTEM — TOXICITY IS A CONCERN IN SOME STREAMS

EXPOSURE LINKS BETWEEN PAHS AND HUMANS BY WAY OF COAL TAR PARKING LOT SEALANTS

- RAINFALL - RUNOFF
- WIND AND SUN – DUST
- TRACKING ON VEHICLES/SHOES
- WORKERS IN DIRECT CONTACT
- INHALATION – FUMES/DUST
- SKIN CONTACT – DIRECT, AIR, WATER
- INGESTION – WATER/FOOD
- SNOW PLOWING CAN RESULT IN SCRAPING OFF THE MATERIAL



COMPLETED STUDIES REGARDING CTS AND ENVIRONMENTAL IMPACTS

- UNITED STATES GEOLOGICAL SURVEY (USGS) – 2005
Particles in runoff from CTS lots had concentrations of PAH's 65x higher than from unsealed parking lots and more than 5x higher than asphalt sealed lots. PAH's in area streams matched more closely with CTS PAHs. Concluded the majority of PAH's in area streams was attributed to runoff from sealcoated parking lots.
- CITY OF AUSTIN, TEXAS, *JOURNAL OF THE N. AMER. BENTHOLOGICAL SOC.* - 2007
Found a correlation between increased PAH levels in stream sediment downstream of CTS parking lots and the health of stream macroinvertebrate communities
- ARTICLE PUBLISHED IN *ECOTOXICOLOGY* - 2006
Study links CTS runoff to decreased amphibian development
- USGS – 2008
Study in 9 cities showing greatly elevated PAH levels in dust samples from CTS lots compared to asphalt sealed and unsealed lots and showing a correlation to elevation PAH levels in lake sediment samples in the central and eastern U.S. where CTS are more prevalent as compared to samples in the west where asphalt sealants are more prevalent.





COMPLETED STUDIES REGARDING CTS AND ENVIRONMENTAL IMPACTS

- USGS – ONGOING

STUDY OF PAH LEVELS IN DUST INSIDE APARTMENTS SERVED BY PARKING LOTS WITH CTS. INITIAL RESULTS ARE SHOWING SIGNIFICANTLY ELEVATED LEVELS AS COMPARED TO APARTMENTS WITH LOTS WITH NO CTS. STUDY HAS NOT YET BEEN COMPLETED AND PUBLISHED.

- EPA – ONGOING

ACCORDING TO PUBLISHED CORRESPONDENCE BETWEEN THE CITY OF AUSTIN AND EPA, IT IS ANTICIPATED EPA WILL BE CONDUCTING A STUDY OF HEALTH RISKS WITH INITIAL FINDINGS IN APPROXIMATELY 18 MONTHS.





QUESTIONS RAISED REGARDING COMPLETED STUDIES

- SCIENTIFIC PROOF
- LACK OF ISOLATING THE PARKING LOT AS THE SOLE SOURCE OF PAH'S IN THE USGS STUDY
- COST AND DURABILITY ISSUES
- CRITICAL LEVELS THAT LEAD TO BIOLOGICAL IMPAIRMENT AND HUMAN HEALTH CONCERNS





PRESENCE OF PAH'S IN LOCAL STREAM SAMPLES

- CITY HAS TESTED FOR PAH'S AND RESULTS HAVE BEEN BELOW DETECTIBLE LIMITS
- PAH'S ARE LIPOPHILIC (DISSOLVE MORE EASILY IN OILS THAN WATER) AND TEND TO CLING TO SEDIMENT PARTICLES. A SEMI-PERMEABLE MEMBRANE DEVICE (SPMD) ASSISTS IN ACCURATELY DETECTING PAH'S AND SEDIMENT SAMPLING IS A BETTER METHOD OF DETECTION
- A 1999 STUDY DONE BY MDNR REVEALED SOME SAMPLES WITH HIGH LEVELS OF PAH'S IN SEDIMENT ON JONES BRANCH. MDNR SUGGESTED FURTHER SIMILAR TESTING OF SEDIMENTS FOR PAH'S TO BEGIN TO ADDRESS TOXICITY AND IMPAIRED MACROINVERTEBRATE POPULATIONS THAT HAVE BEEN IDENTIFIED IN SOME SPRINGFIELD STREAMS.
- A 1999-2000 USGS STUDY ON PEARSON AND WILSONS CREEKS REVEALED PAH'S IN BASE FLOWS AND RUNOFF. ALL SAMPLES TAKEN WITH SPMD SHOWED PAH'S PRESENT AND FURTHER TEST CONFIRM THE SAMPLES TO BE GENOTOXIC DUE TO PAH'S AND VOC'S.





CITIES/COUNTIES THAT HAVE BANNED THE USE OF CTS

- CITY OF AUSTIN, TEXAS
- DANE COUNTY, WISCONSIN (MADISON)
- WASHINGTON D.C.
- LITTLE USE FROM THE ROCKY MOUNTAINS WEST
- LOWE'S AND HOME DEPOT HAVE ONLY ASPHALT BASED SEALANT ON THE SHELF (BLACK JACK BRAND)

Is an asphalt sealer the same thing as a blacktop sealer? What about tar?

A blacktop driveway and an asphalt driveway are the same thing—asphalt is the more “technical” term. Asphalt is naturally black in color, so you’ll hear sealers referred interchangeably as “blacktop sealers” or “asphalt sealers.” However, the “tar” terminology is not applicable to Gardner or Black Jack brands. It refers to an ingredient called Coal Tar. **Gardner and Black Jack products have been upgraded from older coal tar-based technologies into better performing asphalt based formulations.**





LETTER SENT TO INDUSTRY PRODUCERS/ DISTRIBUTORS/CONTRACTORS

- 23 LETTERS WERE MAILED OUT ON DEC 3
- RECEIVED RESPONSES FROM 5 (4 LOCAL)
- ONLY 1 MEMBER OF LOCAL INDUSTRY HAD KNOWLEDGE OF STUDIES THAT HAD BEEN COMPLETED
- REPORTED FROM 3 APPLICATORS THERE IS NEAR 100% USE OF CTS AND FROM 1 APPLICATOR NO USE OF CTS



PRICE AND PERFORMANCE OF CTS TO ASPHALT BASED SEALANT

- HAVE RECEIVED INFORMATION RANGING FROM THE PRICE BEING COMPETITIVE TO CTS BEING 50% HIGHER .
- BASED ON LIMITED RESEARCH IT APPEARS THE PRICE OF BOTH MATERIALS HAS FLUCTUATED GREATLY IN THE LAST 2 YEARS DUE TO WIDE FLUCTUATIONS IN CRUDE OIL PRICE AND STEEL/COAL/COKING DEMANDS AND PRICES (MORE RESEARCH NEEDED).
- HAVE RECEIVED INFORMATION RANGING FROM PERFORMANCE OF CTS BEING 50% BETTER TO ASPHALT BASED BEING BETTER. THIS IS TIED TO PRICE AND IS COMPLICATED BY MANY DIFFERENT GRADES AND VARIETIES OF MATERIAL (MORE RESEARCH NEEDED).
- ASPHALT SEALCOATING DIRECT STATES ON WEB PAGE THEY SELL BOTH PRODUCTS BUT ASPHALT PRODUCTS ARE SAFER, BECOMING MORE POPULAR AND ARE NOW MORE COST EFFECTIVE

POSSIBLE SHORT TERM APPROACH

- CONTINUE TO RESEARCH SPECIFIC QUESTIONS THAT REMAIN
- PROVIDE INFORMATION AND GAIN FEEDBACK FROM THE LOCAL ASPHALT SEALANT INDUSTRY
- CONTACT CITY OF AUSTIN TO LEARN MORE ABOUT THEIR EXPERIENCES AND PROGRAM
- PROVIDE INFORMATION AND GAIN FEEDBACK FROM OWNERS OF LARGE PARKING LOTS SUCH AS:
 - GOVERNMENT ENTITIES
 - SPRINGFIELD R-12
 - UNIVERSITIES
 - CHAMBER OF COMMERCE
 - LARGE RETAIL CENTERS
 - LARGE INDUSTRIAL CENTERS
- SEEK VOLUNTARY REDUCTION OF CTS AND REEVALUATE AT THE END OF THIS PROCESS