



THE GEI MGP Reporter

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Naphthalene: Changes in Cancer Status and Regulatory Implications

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Naphthalene is a commercially important hydrocarbon which is produced from coal tar and petroleum. It is used mainly as an intermediate in the production of phthalic anhydride, naphthalene sulfonates and dyes and to a lesser extent as a moth-repellent.

Cancer studies on mice and rats indicate an increased development of cancerous tumors as a result of exposure to naphthalene. No studies have been conducted on the cancer-causing effects of naphthalene on humans.

In 2002, the International Agency for Research on Cancer ("IARC") classified naphthalene as "possibly carcinogenic to humans (Group 2B)." In 2004, the National Toxicology Program ("NTP") classified naphthalene as "reasonably anticipated to be a human carcinogen."

Once a chemical's status under NTP, IARC, or 29 C.F.R. part 1910, subpart Z (the section addressing material safety data sheet requirements for the Occupational Safety and Health Administration ("OSHA")) indicates that the chemical is a carcinogen or potential carcinogen, the U.S. Environmental Protection Agency

("EPA") refers to these chemicals as the "OSHA carcinogens."

Under CERCLA, the EPA conducts Superfund risk assessments to determine how threatening a hazardous waste site is to human health and the environment. The risk assessment is conducted to evaluate whether action is warranted under CERCLA, to establish cleanup levels, and to determine the residual risk posed by response actions.

EPA originally presented guidelines for assessing human health toxicity values generally recommended for use in risk assessments in "Risk Assessment Guidance for Superfund Volume I, Part A" ("RAGS"). The primary source for toxicity information related to a particular chemical is now found in the Integrated Risk Information System ("IRIS"), an electronic database maintained by EPA. IRIS health assessments contain EPA consensus toxicity values. IRIS is the first tier of the recommended hierarchy as the generally preferred source of human health toxicity values. The second tier includes EPA's Provisional Peer Reviewed Toxicity Values ("PPRT-

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Editorial

Coal Tar — A Global Commodity

By Jerry Zak, Project Manager, GEI Consultants, Inc.

In June 2006, in Fanshi County, Shanxi Province of China, a truck loaded with 80 tons of coal tar overturned and lost much of its nearly 16,000 gallon load. The tar flowed downhill to the Dasha River, which feeds the Wangkuai reservoir in Baoding, a city of 10 million. The problem has been since contained; however, this accident highlights how coal tar remains a current and important global commodity.

Coal tar production in the US has declined sharply in the last 20 years due to environmental constraints and economic realities - its cheaper to produce elsewhere. China is one of those cheaper places. For all we know, the coal tar in the overturned truck was on its way to the US.

MGP in the Movies

The next time you watch the original 1954 Godzilla movie, starring Raymond Burr, keep your eyes out for a scene near the end of the movie with the cast standing on shore in front of an MGP as Godzilla goes into Tokyo Bay.



MGP Reporter

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Vs”) and the third tier includes other toxicity values such as values from the California Environmental Protection Agency and from the Agency for Toxic Substances and Disease Registry (“ATSDR”).

CERCLA requires that ATSDR develop jointly with EPA a list of hazardous substances most commonly found at facilities on the CERCLA National Priorities List (“NPL”); prepare toxicological profiles for each list substance; and assure the initiation of a research program to fill identified data needs associated with the substances. During the development of toxicological profiles, Minimal Risk Levels (“MRLs”) are derived to identify target organs or the most sensitive health effects for a specific duration for a given route of exposure. MRLs are not intended to define clean-up or action levels.

In August, 2005 ATSDR released a Toxicological Profile for Naphthalene, 1-Methylnaphthalene, and 2-Methylnaphthalene.

The EPA uses risk assessment information to develop remediation goals that provide crucial targets for successful remedial alternative to meet. Preliminary remediation goals (“PRGs”) are used for screening purposes and final RGs are used to set the remedial action goals to be attained by the selected remedy.

EPA defines “slope factor” on IRIS as the slope of the dose-response curve in the low-dose region. An upper bound (i.e., the 95% upper confidence limit) on this slope is used instead of the slope itself because it is a statistically more stable number. It is the slope of a curve representing the relationship between the dose of the chemical and the cancer risk. The units of the slope factor are usually expressed as 1/(mg/kg-day). The slope factor can be used to compare the relative potency of different chemical substances on the basis of either chemical weight or moles of chemical.

In June, 2004 the EPA released a document entitled “External Review Draft Toxicological Review of Naphthalene - In Support of Summary Information on the Integrated Risk Information System (IRIS) (“Draft Review”). The Draft Review contained proposed updates to IRIS for naphthalene. The Draft Review considers naphthalene to be carcinogenic by the inhalation pathway, by not the ingestion pathway. Using EPA’s proposed toxicity values, the residential soil screening level drops from 56 mg/kg to 0.82 mg/kg. The estimated soil concentration to protect indoor air from vapor intrusion would be 0.1 mg/kg and the value to protect groundwater from leaching and migration would be 0.003 mg/kg. The vapor intrusion and groundwater values are both below levels found in natural soils and urban fills.

EPA has not released a final review for naphthalene and has not updated the IRIS values for naphthalene since 1998. The EPA is currently conducting a comprehensive review of the available environmental and toxicity data of naphthalene as part of its Federal Insecticide, Fungicide, Rodenticide Act (“FIFRA”) re-registration process. The results of this review are expected in March, 2008.

In August, 2004 California’s Office of Environmental Health Hazard Assessment (“OEHHA”) adopted a unit risk value for naphthalene of 3.4×10^{-5} ($\mu\text{g}/\text{m}^3$)-1 and an inhalation slope factor of 1.2×10^{-1} (mg/kg-day). California considers naphthalene to be carcinogenic by both the inhalation and ingestion pathways. California’s changes have filtered down within the state. In October, 2004, the San Diego Department of Environmental Health updated its Site Assessment and Mitigation Program Manual to include the new naphthalene information. California is the only state to have adopted new risk factors as this time. Florida and Pennsylvania proposed new factors but have since withdrawn their respective proposals pending completion of EPA’s review.

MTBE Example - Experience with MTBE would seem to indicate that there will be little activity or consensus in dealing with naphthalene issues until the federal government completes its evaluation of health and toxicity information. A follow-up survey of states was conducted in 2003 to gauge state responses to changes in MTBE classifications as related to state Leaking Underground Storage Tank (“LUST”) programs. The survey indicated that, while most states sample for MTBE, 33 states say that MTBE drives cleanup/investigative activities less than 20 percent of the time or never. Most states do not intend to reopen closed sites to look for MTBE contamination unless they have a reason to suspect a problem.

The preamble to the National Contingency Plan (NCP) states that EPA, in conducting five-year reviews, will not reopen remedy selection decisions unless a new or modified requirement calls into question the protectiveness of the remedy. These new conditions refer to changes in exposure pathways, changes in chemical toxicity, changes in standards, implementation of institutional controls, and expected progress towards meeting remedial action objectives. Therefore, if EPA does change the chemical toxicity values for naphthalene, there is a possibility that it could choose to reopen Superfund sites to address suspected naphthalene issues. New toxicological findings could force remedies to be revised at sites that have been cleaned up to unrestricted use, including some that have even “dropped out of the system.”

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Newsbriefs

Madison, Wisconsin Considers Ban on Coal-Tar Containing Pavement Sealers

The Winter 2006 issue of the MGP Reporter contained a Newsbrief that described how the City of Austin, Texas banned the use of coal-tar containing pavement sealers within the city limits. The ban was based on cooperative studies by the United States Geological Survey (USGS) and the City of Austin that concluded that surface water run-off from parking areas was carrying PAHs into local creeks.

One of the USGS researchers of the Austin report recently visited Madison, Wisconsin to share the results of the Austin study with state and local officials. The Capitol Times in Madison, picked up the story and recounted the results of the Austin studies and subse-

quent ban. Now Madison officials are evaluating a potential ban on coal tar containing pavement sealers.

According to the Capitol Times report, the Austin study compared average concentrations of PAHs washing off coal-tar-sealed parking lots to those washing off asphalt and cement lots. The Austin study found that average concentrations of PAHs in run-off from coal tar sealed pavement were sixty-five times higher than from unsealed pavement or concrete.

Additional details can be found at the following links:

<http://www.madison.com/archives/read.php?ref=/tct/2006/06/13/0606130351.php>

<http://www.madison.com/archives/read.php?ref=/tct/2006/06/16/0606160441.php>

MGP 2007 Symposium

Mark your calendars for "MGP 2007". The upcoming symposium, hosted by The Electric Power Research Institute (EPRI), is being held January 8-11, 2007 in Atlanta, Georgia at the Buckhead Hyatt. The symposium will highlight advancements in MGP site remediation, placing an emphasis on providing the latest information on data, methods, and tools for cost-effective and environmentally protective MGP management. The range of topics to be discussed includes air monitoring, characterization techniques, groundwater management, sediments management and toxicology.

For more information about the upcoming symposium, please visit EPRI's event calendar at:

<http://inter.viewcentral.com/events/customcalendar.aspx?cid=epri&pid=2>

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At MGP sites, a change in the classification of naphthalene could affect cleanups in three ways: Where soil or groundwater cleanups have been concluded, it is possible that EPA's 5-year review would indicate that the prior cleanup left in place soil or groundwater with naphthalene impacts exceeding applicable risk-based cleanup criteria. For example, EPA's 5-year review of the People's gas site in Dubuque, Iowa, included the following comment: "Toxicity of naphthalene is currently under review. EPA will monitor the situation and modify remediation levels if changes are made in reference dose(s) or if a cancer slope factor is determined." It is difficult to predict how serious the risk may be that EPA will actually reopen any MGP cleanups.

On the one hand, reopening a completed cleanup is a rare event and would not seem to be appropriate or likely where the risk is marginal. On the other hand, though, our own informal review seems to indicate that MGP cleanup contours may be well within the areas dictated by a new naphthalene standard. How these two conflicting factors will play out is not clear.

Where a site is still in the assessment or design stage, naphthalene will likely be one of the soil COCs and may affect the nature or extent of the cleanup, perhaps significantly.

For planned or ongoing groundwater cleanups, naphthalene may cause a change in the nature or extent of the cleanup. The reason for this is that naphthalene is more mobile than other PAHs, but less biodegradable than VOCs. Consequently, naphthalene may be present when other typical MGP constituents are not.

At MGP sites, it is not clear what all this means practically. Where a cleanup is concluded, it would seem to be acceptable to wait and see what the regulators end up doing. This is, for example, the approach taken by EPA. EPA's 5-year review of the People's gas site in Dubuque, Iowa, included the following comment: "Toxicity of naphthalene is currently under review. EPA will monitor the situation and modify remediation levels if changes are made in reference does(s) or if a cancer slope factor is determined."

When a cleanup is in the design or earlier phases, it makes sense to evaluate whether a change in the naphthalene standard could possibly affect the cleanup. If even the most stringent change in the naphthalene cleanup standard could not affect the nature or extent of the planned remediation, then obviously the cleanup can occur as planned. If, however, there are soil or groundwater impacts that would require a cleanup under the stricter naphthalene standard, but would not otherwise, then the analysis becomes more complicated. Assuming there are no potentially unhealthful conditions resulting from a short delay in cleanup, the question is largely economic: Is it easier and cheaper to deal with the additional areas now, or does it make more sense to wait and see what happens to the standard?

In any event, everyone associated with the MGP cleanup process should pay careful attention to this process as it unfolds.

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