



# THE GEI MGP Reporter

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## Is Naphthalene a Carcinogen?

By Jim Roewer, Executive Director, USWAG

In December 2000, the National Toxicology Program (NTP) released results of a rat inhalation cancer bioassay of naphthalene that found an increased number of nasal tumors. These studies led USEPA to review and propose revisions to the Agency's Integrated Risk Information System (IRIS) database that include cancer risk factors for naphthalene. Since USEPA's IRIS database is a primary tool used by federal and state regulators to establish site remediation requirements, the Agency's on-going review and proposed revisions to IRIS will likely influence how naphthalene is regulated in the future.

Naphthalene is a polycyclic aromatic hydrocarbon (PAH) that is associated with various coal and oil-derived materials and is often present in soil, water, and air at industrial and other sites – including manufactured gas plant (MGP) sites. A reassessment of the toxicological potential of naphthalene may lead to significantly altered regulatory requirements applicable to the manufacture, use, management, and disposal of naphthalene.

The Utilities Solid Waste Activities Group (USWAG) has explored the potential regulatory implications of recent toxicological studies of naphthalene. One potential outcome is that federal and state regulatory “target values” for the remediation of naphthalene in air, soil, and water could change. Needless to say, if naphthalene becomes the driver at MGP site cleanups there would be profound operational and economic impacts on the utility industry.

USEPA's review and related industry advocacy efforts have highlighted scientific uncertainty concerning the extrapolation of the toxicological studies in question to humans. This uncertainty has prompted the EPA to consider whether additional studies are needed before adopting the proposed cancer risk factor for naphthalene.

At the same time, USWAG joined with other industry stakeholders to form the Naphthalene Coalition. The goal of the Coalition is to build consensus regarding the state of the science for naphthalene. The Naphthalene Coalition has successfully pressed EPA to defer finalization of

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# Editorial

## Permissible Exposures

By Jerry Zak, GEI Consultants, Inc.

When the results of soil vapor, ambient air, and indoor air samples are validated they typically confirm the “negative” that we expected in the first place. Usually, however, regulatory authorities need analytical non-detects (or detection of unrelated compounds) before they can tell the local community that their health is not at risk and our client, Yoyodyne Tech, is not responsible for the impacts in any case. In the meanwhile, Yoyodyne is spending thousands of dollars a week to prove the negative at multiple sites.

We’d like to break this costly cycle. It’s understandably difficult to do in a residential setting, but should be easier in commercial and industrial settings. Unfortunately, most state-specific soil vapor screening guidelines remain conservative and drive additional sampling.

But consider several federal and independent air “standards”. The first are the Occupational Safety and Health Administration (OSHA) Permissible Exposure Limits (PELs). The second are the National Institute for Occupational Safety and Health (NIOSH) Time Weighted Averages (TWAs). The third are the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs). These standards have little or nothing to do with soil vapor, ambient air, or residential settings. We are not suggesting they should be used for those media or that setting, but a remarkable abyss is created by their existence when no other standards are available, as follows:

- The OSHA PEL for ethylbenzene is 435 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ).
- The NIOSH TWA for ethylbenzene is 435  $\mu\text{g}/\text{m}^3$ .
- The ACGIH TLV for ethylbenzene is 435  $\mu\text{g}/\text{m}^3$ .
- The “background” indoor air concentration for ethylbenzene in one state is 6.4  $\mu\text{g}/\text{m}^3$ , 68 times lower than the previous three organizations.

In short, three respectable organizations with a mission to protect human health set an identical, protective ethylbenzene standard for an informed adult worker (eight hours a day, five days a week), but a state agency requires additional sampling and analysis when ethylbenzene is present in indoor air at a minimal concentration of 6.5  $\mu\text{g}/\text{m}^3$  (67 times lower than the PEL, the TWA, and the TLV).

True, at the OSHA/NIOSH/ACGIH job sites the workers inhaling ethylbenzene have been educated about it and given the choice to avoid it (i.e., use controls or find another job). The point is this: federal agencies are saying (and already have in print) that breathing ethylbenzene at 435  $\mu\text{g}/\text{m}^3$  for eight hours a day, five days a week, is unlikely to irreversibly affect the health of workers. We also have some state agencies requesting additional data because inhaling 67 times less might be a risk - even in commercial or industrial settings, where the only people are adult workers, and their presence is generally limited to eight hours a day, five days a week.

We’ve begun to describe the PELs, with appropriate qualifications, in site characterization reports where the reviewing regulatory agencies do not have “standards. Some agencies feel that the discussion is irrelevant or inappropriate. We disagree. We believe it throws light into the abyss. In the absence of other accessible standards, how can an uninformed reader develop context?

## Speak Up

Reader, Claude M. Masse of VHB, e-mailed to let us know about a recent article he read where he learned of an interesting use of coal tar. In the May/June 2009 edition of *Eastern Fly Fishing*, the “Pioneers and Legends” section had an article titled “Seth Green (1817-1888), Father of American Fish Culture”. Here’s the excerpt: “The only known way to transport fish eggs long distances was in buckets of water, which were clumsy and heavy and required constant changes of water, especially for trout and salmon. Seth and Monroe Green devised a special type of box that would carry eggs damp instead of being surrounded by water. The boxes were **treated with coal tar** to prevent fungus infections, and not only did they weigh about 50 pounds (as opposed to 120 pounds for water-filled cans) but fish could now be transported for as long as four months, opening up a whole new world (and in some cases a Pandora’s box) in the introduction of fish species far from their native waters.” Email us with your coal tar discoveries: [dunites@geiconsultants.com](mailto:dunites@geiconsultants.com).

## MGP Reporter

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the draft IRIS risk assessment to allow for additional scientific/toxicological information to be developed.

## Naphthalene State of the Science Meeting (NS3)

In October 2006, the University of Nebraska, EPA, and The Naphthalene Coalition sponsored a symposium on the state of naphthalene science (NS3). The purpose of NS3 was to discuss what is known and unknown about the potential human carcinogenic risk posed by exposure to naphthalene at environmentally relevant doses. The meeting identified gaps in scientific knowledge and proposed specific and targeted research projects that would resolve these scientific uncertainties.

Independent expert scientists participating in NS3 ratified the Naphthalene Coalition's scientific concerns with EPA's draft 2004 risk assessment by agreeing that:

- Naphthalene is itself neither toxic nor carcinogenic at environmentally-relevant doses; metabolism of naphthalene is required to elicit an adverse response.
- Naphthalene-induced tumor formation is unlikely unless there is cytotoxicity, suggesting there is a threshold level of concern for naphthalene.
- Concentrations of naphthalene used in bioassays are orders of magnitude higher than those faced by even the most exposed individuals in the population.

The two most important scientific issues and questions identified during the symposium were:

- Whether metabolism of naphthalene generates toxic metabolites in humans in the tissues of concern. In other words, is naphthalene likely to be carcinogenic in humans at any level?
- Whether significant cell death is required to elicit tumor development and whether sufficient cell death will result from exposures at environmental levels. In other words, is naphthalene a threshold carcinogen?

All these conclusions, issues, and questions are consistent with previous public comments by the Naphthalene Coalition, independent scientists, other public health agencies, and members of EPA's peer review panels.

A number of the papers presented at NS3 were submitted to the *Journal of Regulatory Toxicology and Pharmacology* and published as a special issue of the Journal (Volume 51, Issue 2, Supplement 1).

## Naphthalene Research Committee

At the conclusion of NS3 there was wide agreement on the most important scientific issues associated with naphthalene toxicity. Symposium participants suggested a research agenda aimed at addressing those issues. Working in conjunction with EPA, the Naphthalene Coalition developed a research plan to address the questions that would allow EPA to reduce uncertainty in the draft IRIS draft risk assessment.

To formally support those research activities, the Naphthalene Coalition re-organized as the Naphthalene Research Committee. USWAG continues to support this effort, along with coalition allies: American Petroleum Institute, Asphalt Institute, the Association of American Railroads, the Naphthalene Council and Electric Power Research Institute (EPRI). The Committee's multi-year research program builds on findings of the NS3. It is designed to improve understanding of the potential cancer risk of naphthalene and its metabolites and support appropriate revisions to the IRIS Tox Profile.

EPA staff involved in the IRIS review continue to show a great deal of interest in the research, and EPA's most recent revision of the IRIS TRACK schedule for naphthalene targets 2010 for EPA review of the draft IRIS risk assessment for naphthalene. This schedule will allow the NRC's research efforts to be incorporated into the IRIS assessment.

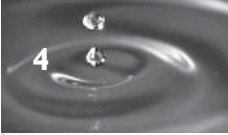
## Naphthalene Research Review – Interim Results

Last summer, the NRC met to review the results of recent naphthalene health effects research and to discuss possible future research directions.

So, what have we learned so far? Preliminary research findings show the induction of olfactory lesions in rats, with some evidence of threshold dose and reversibility of the impact, as well as some tumorigenic effects of higher-level exposures in both live rodents (i.e., rats and mice) as well as in vitro rat and primate (i.e., monkey) tissues. However, the apparent changes in the subject organisms/tissues occur at exposure levels of 10 parts per million (ppm) and greater - a level at which metabolic saturation occurs. This indicates that naphthalene's metabolic pathway - the formation of biologically-active metabolic breakdown products - plays a critical role in potential carcinogenesis.

The Obama Administration has pledged that science will guide its regulatory decisions.

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## GEI Adds Five Senior MGP Professionals to Utility Group

GEI Consultants, Inc. has hired five senior engineers with extensive in-the-trenches experience in Manufactured Gas Plant (MGP) site investigation, engineering design, remedy implementation, client service, and regulatory savvy. The five have been involved with MGPs since the early 1980s, as MGP sites and site management issues took a huge part on the environmental stage. They have been working together since they were a team at Remediation Technologies, Inc. (RETEC), during the late 1990s. GEI welcomes these former competitors and is proud to offer their unique skills and personalities to our utility clients.

The five are John Finn, P.E. located in Ithaca, NY; Roger Hathaway, P.E. and Timothy Olean located in Glastonbury, CT; Alfred Leuschner located in Woburn, MA; and Dave Work located in Montclair, NJ. Each senior expert brings significant technical and management expertise to GEI's existing MGP practice.



John T. Finn, P.E. has specialized in MGP remediation and remediation of contaminated sediments for over 24 years. His strengths include client relations and the negotiation of regulatory issues. He particularly enjoys building high-performance, multi-disciplinary teams focused on remediation engineering. Most recently, John held the positions

of remediation engineer, account manager and operations manager. Active in numerous professional organizations, he is a Licensed Professional Engineer in the states of New York, Georgia, and Washington. He graduated from the University of Connecticut with a bachelor's degree in chemical engineering and from Cornell University with a master's degree in agricultural engineering with a focus on waste management. John joins GEI as a Senior Manager and will be working in the Ithaca, New York area.



Roger Hathaway, P.E. has spent over 20 years in the field of environmental remediation with a primary focus on compliance management programs. He specializes in the management of manufactured plant site remediation programs, urban property remediation, urban waterways, regulatory negotia-

tions, and stakeholder communications. In addition, he has been heavily involved in the public relations and communications coordination for two utilities in New York State. Responsibilities for this project include developing communication strategies, regulatory negotiations and the management of MGP remediation in a complex political environment. Roger is a licensed Professional Engineer in the State of Maine and has a bachelor's degree in chemical engineering from Rensselaer Polytechnic Institute. He is located in GEI's Glastonbury, Conn. office.



Alfred Leuschner is a recognized leader in the MGP/Utility Market with over 30 years of experience.

One of his key responsibilities will be to help expand GEI's MGP/Utility practice. Al has provided typical consulting services to the industry with work in investigations, feasibility studies, engineering design and liability cost estimating. His capabilities also extend to bringing innovative remedial technologies to field scale applications at MGP sites. It is in this area that he is widely published. Al received his bachelor's degree in civil engineering from the University of Vermont and his master's degree in environmental engineering from Cornell University. He is located in GEI's corporate headquarters in Woburn, MA.



Timothy J. Olean is a service line manager for remediation, construction and operations with over 21 years of experience. He has extensive experience in program construction management and project management, subcontractor management and cost control for large-scale remediation construction projects. He is also well versed in alternative development, review and selection, detailed cost estimating, and project design and constructability review, all as they relate to remediation services. Tim obtained his bachelor's degree in engineering management from the University of Vermont and will be located in GEI's Glastonbury, Conn. office.



Dave Work is a professional engineer in the states of New York, New Jersey and Connecticut. He has over 12 years of experience in environmental engineering and project management focused specifically on operations management, engineering design, construction, strategic planning, program/project management, process improvement and business development. His technical experience is centered on the environmental construction activities of large site manufactured gas plants in heavily urbanized environments. Dave received his bachelor's degree in civil engineering from Lehigh University and his master's of science degree in civil engineering from the University of Massachusetts. He will work from GEI's Montclair, New Jersey office.



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Additional research to better compare the cross-species metabolic activities and assess impacts at lower exposure levels to better define any dose-response relationship will continue through 2009.

The Obama Administration has pledged that science will guide its regulatory decisions. The research sponsored by the NRC should provide EPA with the scientific information necessary to produce a final IRIS Tox Profile for naphthalene that reflects actual toxicity, and that should result in the most appropriate regulatory treatment for naphthalene-related cleanups. [As reported in the Summer 2006 MGP Reporter, if EPA changes the chemical toxicity values for naphthalene, the change could result in "reopeners" at federal and or state sites previously deemed to require no further action.]

### Questions or Comments?

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## Newsbriefs

### Coal Tar Ignites Debate

In Sandusky, Ohio, a "coal tar plume is proving to be a sticky issue" for cleanup along the city's shoreline. Under the current remediation plan, the city would build a wall down to the bedrock to block the coal tar plume from advancing toward the water. But based on a number of factors, local brownfields consultants believe the coal tar might be in the bedrock, and consequently it would just go under the wall. They have suggested drilling on city property to get samples from the bedrock. The city has grant money for further assessment, which would include drilling. Representatives from the EPA say the city needs to do more research. *Sandusky Register*, 4/16/2009

### Industrial History Preserved in Photographs

TROY, NY — The city's vibrant industrial past has a polluted legacy that's slowly being cleaned up in South Troy. Crews began tearing down dilapidated buildings Monday on what is now commonly called the King Fuels site. But before it was known for its fuel tanks, the spot was where the deck plates for the USS Monitor were made in the Civil War and where the American steel industry got its start with the Besser Steel plant built in 1865 off Water Street. It wasn't steel that polluted the 15-acre tract just 200 yards north of the Menands Bridge. It was the manufacture of gas from coke in the early 20th century. From those operations which produced gas that was

pipled as far away as Glens Falls and Amsterdam for power, an estimated 120,000 cubic yards of coal tar was produced and left at the site. Before the city started the demolition, which will cost \$300,000 to \$500,000, it cooperated with P. Thomas Carroll, executive director of the Hudson Mohawk Industrial Gateway, to document the historic aspects of the property. A photographer from the Historic American Engineering Record spent two days on the site in March. "The city of Troy is to be commended for agreeing to procure professional photographic documentation of the industrial sites on the South Troy waterfront before their demolition," Carroll said in a statement. *Times Union*, 4/14/2009.

### Coal Tar was a winner at Science Fair

Five Montana, Chief Joseph Middle School students won a four-day trip to Yellowstone National Park for presenting one of the top 10 overall projects at the regional fair. For having outstanding energy projects, NorthWestern Energy awarded \$50 to Jason Baide for his hydro-electric generator built from scratch and \$75 to Galen Swain for his project on plants and coal tar. The successful students are among 60 at CJMS taking new "science access" classes this year. Other winning topics were bone mineralization; avalanches and whether germs are more likely to spread among younger or older children. *Bozeman Daily Chronicle*, 4/16/2009