ENVIRONMENTAL NEWS, REGULATIONS, & TECHNICAL DISCUSSIONS

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Atlanta Environmental Management, Inc.

Newsletter

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EPA Proposes to Slash Mercury Emissions from Cement Plants

Washington, D.C.
April 21, 2009

EPA is proposing to significantly reduce mercury emissions from Portland cement kilns, the fourth-largest source of mercury air emissions in the U.S. The proposal would set the nation's first limits on mercury emissions from existing Portland cement kilns and would strengthen the limits for new kilns.

The proposed standards also would set emission limits for total hydrocarbons, particulate matter, and sulfur dioxide from cement kilns of all sizes and would reduce hydrochloric acid emissions from kilns that are large emitters.

"We can save more than a thousand lives each year, sharply reduce mercury and other toxins in our air and water, and work with industry to encourage innovations and good ideas that are already out there," said EPA Administrator Lisa P. Jackson. "Mercury and other chemicals flowing into these communities are health hazards for children, pregnant mothers, local residents and workers—people who deserve protection."

Mercury in the air eventually deposits into water, where it changes into methylmercury, a highly toxic form that builds up in fish. Americans are primarily exposed to mercury by eating contaminated fish. Because the developing fetus is most sensitive to the toxic effects of methylmercury, women of childbearing age and children are regarded as the population of greatest concern.

The majority of the toxic emissions at cement kilns come from the burning of fuels and heating of raw materials. When fully implemented in 2013, EPA estimates that this rule would reduce annual emissions by at least:

- Mercury—11,600 pounds, a reduction of 81 percent
- Total hydrocarbons—11,700 tons, or 75 percent
- Particulate matter—10,500 tons, or 96 percent
- Hydrochloric acid—2,800 tons, or 94 percent
- Sulfur dioxide—160,000 tons, or 90 percent

EPA estimates that the benefits of this proposed rule will significantly outweigh costs.

The proposal is in response to a request to reconsider the December 2006 emissions standards for Portland cement manufacturing facilities.

EPA will take public comments on the proposal for 60 days after publication in the Federal Register. EPA will hold a public hearing on the proposal if one is requested. Hearing requests must be received within 15 days of publication in the Federal Register.

More information is available on line http://www.epa.gov/ttn/oarpg/t3pfpr.html

For air permitting assistance or for questions regarding this proposed rule, please contact Terry O'Heron at AEM (terryoheron@aem-net.com)

Low-Reactivity Volatile Organic Compounds Deregulated

U.S. EPA, Washington, D.C.
January 21, 2009

Tropospheric ozone, commonly known as smog, occurs when volatile organic compounds (VOCs) and nitrogen oxides (NOX) react in the atmosphere. Because of the harmful health effects of ozone, EPA and state governments limit the amount of VOCs and NOX that can be released into the atmosphere. The VOCs are those organic compounds of carbon that form ozone through atmospheric photochemical reactions. Different VOCs have different levels of reactivity—that is, they do not react to form ozone at the same speed or do not form ozone to the same extent. Some VOCs react slowly, and changes in their emissions have limited effects on local or regional ozone pollution episodes.

It has been EPA's policy that organic compounds with a negligible level of reactivity should be excluded from the regulatory definition of VOC, so as to focus VOC control efforts on compounds that do significantly increase ozone concentrations. EPA also believes that exempting such compounds creates an incentive for industry to use negligibly reactive compounds in place of more highly reactive compounds that are regulated as VOCs. EPA lists these negligibly reactive compounds in its regulations [at 40 CFR 51.100(s)] and excludes them from the definition of VOCs.

EPA labels a VOC as negligibly reactive based on a comparison with ethane. That is, compounds that are less reactive than, or equally reactive to, ethane under the assumed conditions may be deemed negligibly reactive. Compounds that are more reactive than ethane continue to be considered reactive VOCs and are therefore subject to control requirements. The selection of ethane as the threshold compound was based on a series of smog chamber experiments that underlay the 1977 policy.

Propylene carbonate has been used in cosmetics, as an adhesive in food packaging, and as a solvent for plasticizers, synthetic fibers, polymers, and aerially applied pesticides. Huntsman Corporation submitted a petition to EPA on July 27, 1999, requesting that propylene carbonate be exempted from VOC control based on its low reactivity relative to ethane.

Dimethyl carbonate (DMC) may be used as a solvent in paints and coatings, as a methylation and carbonylation agent in organic synthesis, and as a fuel additive. EPA received a petition from Kowa America Corporation on July 29, 2004, seeking an exemption from the regulatory definition of VOC for DMC. This petition asserted that DMC is less photochemically reactive than ethane and asked for the exemption on that basis.

Therefore, stating that they are negligibly reactive in the formation of tropospheric ozone, EPA has removed the industrial chemicals propylene carbonate and dimethyl carbonate from its list of VOCs. The effect of EPA's action is twofold. One, it relieves states of the obligation to consider these chemicals when writing state implementation plans (SIPs) developed to attain the ozone national ambient air quality standard (NAAQS). Second, it removes one regulatory barrier that would inhibit use of the chemicals by industry.

Additional information about these air quality revisions is available at the following URL: www.epa.gov/EPA-AIR/2009/January/Day-21/a1150.htm

EPA Administrator Reinstates Full TRI Reporting Requirements

Washington, D.C.
April 21, 2009

EPA Administrator Lisa P. Jackson signed a final rule to reinstate stricter reporting requirements for industrial and federal facilities that release toxic substances that threaten human health and the environment. "People have a right to information that might affect their health and the health of their children—and EPA has a responsibility to provide it," said Administrator Jackson. "Restoring the TRI reporting requirements assures transparency and provides a crucial tool for safeguarding human health and the environment in our communities."

The goal of TRI is to empower citizens, through information, to hold companies and local governments accountable in terms of how toxic chemicals are managed. EPA compiles the TRI data each year and makes the information available through several data access tools, including the TRI Explorer and Envirofacts. There are other organizations that also make the data available to the public through their own data access tools, including Unison Institute, which puts out a tool called "RTKNet," and Environmental Defense, which has developed a tool called "Scorecard."

The TRI program has expanded significantly since its inception in 1987. The Agency has issued rules to roughly double the number of chemicals included in the TRI to approximately 650. Seven new industry sectors have been added to expand coverage significantly beyond the original covered industries, i.e., manufacturing industries. Most recently, the Agency has reduced the reporting thresholds for certain persistent, bioaccumulative, and toxic (PBT) chemicals in order to be able to provide additional information to the public on these chemicals.

Armed with TRI data, communities have more power to hold companies accountable and make informed decisions about how toxic chemicals are to be managed. The data often spur companies to focus on their chemical management practices because they are being measured and made public. In addition, the data serve as a rough indicator of environmental progress over time.

The final rule reinstates Toxics Release Inventory (TRI) reporting requirements that were replaced by the TRI Burden Reduction Rule in December 2006. The 2009 Omnibus Appropriations Act, signed by President Obama on March 11, 2009, mandated that prior TRI reporting requirements be reestablished. These changes will apply to all TRI reports due July 1, 2009.

TRI is a publicly available EPA database that contains information on toxic chemical releases and waste management activities reported annually by certain industries as well as federal facilities. The December 2006 TRI Burden Reduction Final Rule expanded Form A eligibility for non–persistent, bioaccumulative, toxic (non-PBT) chemicals to 5,000 pounds and allowed use of Form A for the first time for PBT chemicals under limited circumstances. This rule was met with concern over the availability of required data under the Emergency Planning and Community Right-to-Know Act (EPCRA) and resulted in a lawsuit by 13 states to restore the TRI Form A thresholds and usage to what they were prior to the 2006 rule.

Following the rule signature, all reports on PBT chemicals must be submitted on the more detailed Form R. For all other chemicals, the shorter Form A may only be used if the annual reporting amount is 500 pounds or less and less than 1 million pounds of the chemical was manufactured, processed, or otherwise used during the reporting year. TRI-ME software and other reporting assistance materials are being revised and will be available soon. TRI reports for 2008 are due on July 1, 2009.

More information on TRI is available at http://www.epa.gov/tri/

EPA to Consider Green Cleanup Standard Initiative

U.S. EPA Office of Solid Waste and Emergency Response
(March 2009)

EPA is considering options to develop a voluntary standards and verification system that evaluates and recognizes efforts to maximize the net environmental benefit of cleaning up contaminated sites. These standards for "green cleanup" would guide and stimulate efficient, cost-effective, and low-impact site remediation by encouraging property owners, developers, and communities to go beyond state and federal requirements for cleanup as well as land revitalization projects.

EPA's Office of Solid Waste and Emergency Response (OSWER) is working with private and public partners to foster the use of best management practices (BMPs) for green remediation at contaminated sites throughout the United States. OSWER is documenting the state of BMPs, identifying opportunities for improvement, establishing a community of BMP practitioners, and developing mechanisms and tools to help site cleanup and reuse stakeholders make informed decisions about "green cleanup" strategies.

A green cleanup standard would increase the use of green approaches by:

- Providing uniform definitions, consistent methods, mutual expectations, and common goals that can be used by all state and federal cleanup programs without modification to current policy, guidance, or regulation
- Offering a consistent approach that overlays the various regulatory frameworks making it easier for the regulated community to implement
- Rewarding responsible parties for the extra effort involved in green cleanups
- Offering a framework for the new tools being developed to evaluate impacts from cleanups
- Building upon existing state and local government incentives being developed for green cleanups

OSWER and regional offices are also currently working with state agencies to develop a framework outlining the desired outcomes of a potential green cleanup standards and verification system.

Potential Components of a Green Cleanup Standard:

- Energy use and efficiency—Minimize total energy use and maximize use of renewable energy
  - ◊Use of energy-efficient equipment
  - ◊Power cleanup equipment through on-site renewable energy sources
  - ◊Purchase commercial energy from renewable resources
- Water use and efficiency—Minimize water use and impacts to water resources
  - ◊Maximize water recycling—Capture clean and treated water for reuse (i.e., aquifer recharge or irrigation)
  - ◊Employ best management practices for storm water
- Land and ecosystem enhancements
  - ◊Integrate anticipated site use or reuse plans into cleanup strategy
  - ◊Minimize areas requiring activity or use limitations
  - ◊Minimize unnecessary soil and habitat disturbances or destruction
  - ◊Restore or create habitat using native species and local materials
- Material consumption and waste generation
  - ◊Minimize consumption of virgin materials
  - ◊Use recycled products
  - ◊Minimize waste generation
  - ◊Segregate and reuse or recycle materials, products, and infrastructure
- Long-term stewardship
  - ◊Maximize long-term system performance through periodic evaluation, maintenance, and optimization
  - ◊Ensure responsibility and monitoring of institutional and engineered controls
  - ◊Minimize energy use and waste generation during monitoring

Benefits for site owners may include federal and state agency recognition, enhanced public acceptance and corporate reputation, and possible qualification for government tax credits, loans, or rebates. Benefits to cleanup programs include increased sharing and leveraging of resources to develop, implement, and promote greener cleanups.

More information is available at EPA's CLU-IN Technology website: http://www.clu-in.org/greenremediation

Mycoremediation: Fungi's Role in Remediation of Soil and Groundwater Contaminants

Mycoremediation is a form of bioremediation, the process of using fungi to return an environment contaminated by pollutants to a less contaminated state. One of the primary roles of fungi in the ecosystem is decomposition, which is performed by the mycelium. The mycelium secretes extracellular enzymes and acids that break down lignin and cellulose, the two main building blocks of plant fiber. These are organic compounds composed of long chains of carbon and hydrogen, structurally similar to many organic pollutants.

Not only can these fungi be used to break down harmful pollutants in the environment, but they can also act as filters for the environment. Mycofiltration is a similar process, using fungal mycelia to filter toxic waste and microorganisms from water in soil. Mycofiltration could be used in buffer zones around streams, which would filter the run-off from farms, highways, and suburban zones. The key to mycoremediation is determining the right fungal species to target a specific pollutant.

Potential applications for mycoremediation technologies include:

- Agricultural waste reduction
- Creation of buffer zones
- Nonpoint source pollution reduction in watersheds
- Contaminated sediment cleanup
- Reduction of material relegated to confined disposal facilities
- Decontamination
- Minimization of contaminants from road run-off

Contaminants under investigation include petroleum, fertilizers, pesticides, explosives, and a wide assortment of agricultural, medical, and industrial wastes. In field applications, the natural microbial community participates with the fungi to completely break down contaminants to carbon dioxide and water. Higher wood-degrading fungi are particularly effective in breaking down aromatic pollutants, as well as chlorinated compounds.

The three types of fungi—saprophytic, parasitic, and mycorrhizal species—vary in use for the type of bioremediation processes.

- Saprophytic fungi use enzymes to decompose biologic material.
- Parasitic fungi are able to destroy bacteria and other pathogens.
- Mycorrhizal fungi remove substances from the biosphere.

The mycelia of fungi, like roots of plants, exude enzymes and secondary metabolites that break down molecules that otherwise might only be broken down by more toxic substances. Lignin peroxidases (enzymes), which are exuded by saprophytes, dismantle the long chains of hydrocarbons, found in the lignin of plant tissue, into simpler forms. These same enzymes also are able to break apart carbon ring structures found in petrochemicals and other harmful pollutants, such as pesticides and PCBs.

Mycoremediation may have benefits in industrial processes such as the paper industry. The process of paper production involves the removal of lignin from wood pulp. Current methods employ toxins for the removal of lignin and in the bleaching process used to overcome the discoloring effects of the presence of small amounts of lignin in paper. As discussed previously, fungi have the means, via enzyme production, to decompose just the lignin in plant material; therefore, in this instance the lignin would be removed, leaving the cellulose of wood. If fungi or their by-products were used in paper production it may be possible to eliminate a large source of pollution to the environment.

Case Study: Paul Stamets is a leading pioneer of the idea of mycoremediation or bioremediation using mushrooms. Stamets has worked with Battelle Laboratories to study the effects of mushrooms on the bioremediation of contaminants. Under the stewardship of Dr. Jack Word, Stamets and his team began a series of experiments employing the strains from his mushroom gene library, many of which were secured through collecting specimens while hiking in the old growth forests of the Olympic and Cascade mountains.

The first significant study showed that a strain of oyster mushrooms could break down heavy oil. A trial project at a vehicle storage center controlled by the Washington State Dept. of Transportation (WSDOT) enlisted the techniques from several competing bioremediation groups. "WSDOT and Battelle each funded part of this experiment, in which three bioremediation methods and untreated controls were compared. Each test-and-control mound was about 10′ x 10′ x 3′, or about ten cubic yards of contaminated soil. Two methods were applied by WSDOT and its subcontractor: one employed native bacteria, the other used engineered bacteria, and both required monthly fertilizing and tilling. Our group applied the living mycelia of oyster mushrooms." Three mounds of soil were injected with a different mixture of diesel fuel, motor oil, gasoline, and other petroleum hydrocarbons. One berm of soil approximately 8′ x 30′ x 3′ high was injected with mushroom spawn while other technicians employed a variety of methods ranging from bacteria to chemical agents. After 4 weeks, the tarps were pulled back from each test pile. The hydrocarbon-laden pile was bursting with mushrooms. Oyster mushrooms up to 12 inches in diameter had formed across the pile. Analyses showed that more than 95% of many of the PAH (polycyclic aromatic hydrocarbons) were destroyed, reduced to non-toxic components, and the mushrooms were also free of any petroleum products.

After eight weeks, the mushrooms had rotted away; however, as the mushrooms rotted, flies were attracted. The flies became a magnet for other insects, which in turn brought in birds. Apparently the birds brought in seeds. By the study's end point at twelve weeks, the total petroleum hydrocarbons had been reduced by mycoremediation, and the soil had been enriched by the treatment and by the development of a complex community. The soil was tested and shown to be nontoxic and suitable for use in WSDOT's highway landscaping.

WE HELP SOLVE ENVIRONMENTAL AND ENGINEERING PROBLEMS! PLEASE GIVE US THE OPPORTUNITY TO WORK WITH YOU.

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ABOUT US ...

AEM is a small, woman-owned business founded in 1988. Janet Hart, who has been President since 1988, continues to manage day-to-day operations that have led to our significant growth since inception and our continued success in the environmental market. Although company growth is an objective, it is our philosophy that growth is secondary to client service and quality. Put simply, the company's primary loyalty is to its clients, not to the growth of the company, unless growth provides for better client service. Building strong and lasting relationships with our clients is the most important thing that we can do to achieve our goals and ensure our future success.

AEM is committed to providing high-quality, cost-effective environmental services with a primary goal of client satisfaction. One quality that sets AEM apart from the competition is the personalized service and attention given to clients—the direct response to our clients' needs in a timely manner. We continuously work to improve the quality of our services to our clients.

AEM actively supports a number of charities including Doctors Without Borders, the U.S.O., the Antares Orphan Foundation, the Humane Society of the United States, and the Society for the Prevention of Cruelty to Animals.

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