



## AEM Hydrogeologist Tony Gordon, P.G.

Tony Gordon is well known to a number of our clients, having worked on a number of their projects, in some cases, for 15 to 18 years. His experience in geology, hydrogeology, and geochemistry provides a sound basis for understanding complex geological sequences, groundwater flow, and contaminant migration.

Tony is a senior scientist with AEM and a valuable member of the AEM team. He is a registered Professional Geologist in a number of states, including Georgia, Tennessee, North Carolina, Alabama, and Virginia.

Tony received a BA degree in geology in 1984 from Humboldt State University and an MS degree in geochemistry from Eastern Washington University. After obtaining his academic credentials, Tony worked for a large national environmental and engineering company and was involved with the investigation and assessment of complex geological and hydrogeological conditions.



AEM was formed in 1988 and Tony joined us in 1990, making him one of our most senior, and most valuable, employees. His experience is put to use daily on projects for our clients where a thorough knowledge of geology is required to address the complex bedrock and coastal plain geology found in the southeastern United States.

In addition to his project-related work, Tony serves as our Manager of Field Operations. He schedules and tracks our various field activities to ensure that staff are available to perform necessary work within client and regulatory schedules. As a senior scientist and staff member, Tony

serves as a mentor to our junior staff, providing training and guidance in performing field procedures such as groundwater monitoring, sample collection and identification, and advanced investigation techniques such as permeability testing and *in situ* pressure testing.

Another area where Tony's experience is invaluable is the planning and implementation of subsurface drilling programs. His extensive experience in this area allows AEM to develop the most economical investigative plans that use a variety of drilling and sampling techniques that are selected based on site-specific conditions. At times this may require conventional drilling equipment, which is usually more economical, or state-of-the-art techniques such as roto-sonic, which is more expensive but faster. The exact method selected must balance cost and schedule, and site complexity, and Tony is our "go to" man where this is an issue.

### Inside this issue:

- Technology Section: Remediation of Soils and Groundwater by Surfactant-Aided Soil Washing** 2
- Georgia EPD Proposes to Reissue NPDES General Permits** 3
- Formaldehyde Emissions from Composite Wood Products** 3
- Listing Amendment for F019 Wastewater Treatment Sludge** 3
- About Us....** 4

## AEM Staff to Attend Environmental Law Summer Seminar

AEM president Janet Hart and vice presidents Loring Pitts and Michael Brock will again attend the annual Environmental Law Summer Seminar sponsored by the Institute of Continuing Legal Education in Georgia and cosponsored by the Environmental Law Section of the State Bar of Georgia. The seminar is a two-day event, held at the Crown Plaza Hilton Head Island Beach Resort. This year the seminar will be held on August 1-2, 2008.

The Program Chair for this year's event will be Martin A. Shelton, Chair of the Environmental Law Section of the State Bar of Georgia. Mr. Shelton is with Schulten, Ward & Turner, LLP, Atlanta, Georgia.

The seminar typically provides a number of presentations related to environmental issues, general legal areas, and regional topics, pre-

sented by experts in these areas. This year is no different. Some of the topics include the resurrection of CERCLA contribution, including Atlantic Research, recent developments in U.S. EPA Region VI enforcement trends, a panel discussion regarding Georgia's Water Plan, and environmental regulation through the use of zoning and other local land use controls. A complete listing of presentations and discussions can be found on the web at <http://www.iclega.org/programs/pdf/environment.pdf>.

Janet, Loring, and Michael are looking forward to attending this event, and AEM will again have a booth in the lobby where they can meet with old acquaintances and clients and provide information about AEM. If you plan to attend, please visit our booth.

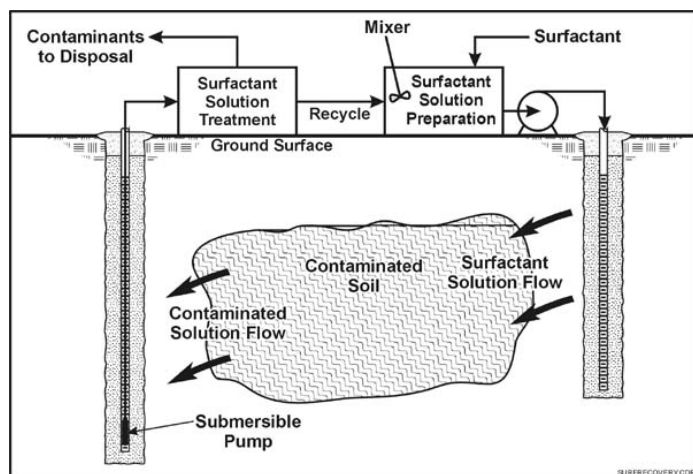
We look forward to meeting with you, discussing upcoming regulatory trends, and discussing any questions that you may have related to environmental issues. We will be happy to provide you with information regarding our experience and qualifications and to discuss any particular environmental problems that you have or may need to address in the future.

Although the seminar was specifically developed to present and discuss legal issues, the setting, at South Carolina's beautiful Hilton Head Island, is worth the trip. There are a number of activities not only for the participants but also for the family.

## Remediation of Soils and Groundwater by Surfactant-Aided Soil Washing

Surfactant flushing is a remediation process that consists of cycling an injected chemical solution through zones of the subsurface contaminated by non-aqueous-phase liquids (NAPLs). The chemical surfactant is typically mixed on site, injected, then recovered using either vertical wells or horizontal drainlines. Upon contact with the NAPL, the surfactant solution will bring about an increase in the aqueous solubility of the contaminants and increase the removal efficiency. Increased solubility and dissolution allows more effective removal of the source of contamination using conventional pump-and-treat techniques.

Depending on the particular chemical formulation, surfactants increase the physical mobilization of the NAPL. Regardless of whether the primary removal mechanism is solubilization, mobilization, or a combination of the two, fluids must be recovered from the subsurface and either treated on site or shipped off site for disposal. Methods of on-site treatment might include biological treatment or air stripping. Efficient and cost-effective treatment of produced fluids is currently one of the biggest challenges facing this technology. Current studies suggest that treatment and recycling of the surfactant may be key to establishing a more effective process. A typical surfactant system is conceptualized in the following figure.



The implementation of a surfactant “flood” is a very aggressive method of recovering contaminants from the subsurface. The advantage of this technology compared to certain other groundwater remediation technologies is the potential to remove large amounts of NAPL in a relatively short time. However, there are risks associated with the implementation of this technology, including the potential to worsen the extent of contamination through uncontrolled vertical NAPL mobilization, the potential short-term risk of exposure due to the elevated contaminated concentrations in groundwater, and the possible need for long-term containment of un-recovered contaminants.

### Key Concepts

Although surfactant use is a proven technology, its success, like other remediation technologies, is subject to the laws of chemistry and physics and must be designed for any particular site based on geological and hydrogeological conditions, the physical nature of

the contaminant, and overall requirements and goals of the project. Key aspects and considerations for surfactant use are as follows:

- Surfactants are chemical agents that alter the properties of solution interfaces. They can be added to an aqueous solution and injected into an aquifer to bring about both an increase in NAPL solubility and a decrease in NAPL-water interfacial tension.
- The increase in total aqueous solubility that occurs in a surfactant system is always associated with a decrease in interfacial tension.
- Surfactants chosen to increase NAPL solubility without achieving ultra-low interfacial tensions are employed in a solubilization “flood.” Surfactants chosen to achieve ultra-low interfacial tensions are employed in a mobilization flood. Solubilization surfactants may still lower interfacial tension enough to cause some NAPL mobilization.
- Surfactant molecules have both a hydrophilic and a hydrophobic portion, and they are generally classified as either anionic, cationic, or nonionic.
- The relative influence of the hydrophilic and hydrophobic portions of the surfactant molecule can be characterized by the surfactant charge density and the hydrophile-lipophile balance (HLB) number.
- If sufficient surfactant is added to aqueous solution, aggregations of surfactant monomers called micelles will form. This occurs at the critical micelle concentration (CMC). A thermodynamically stable solution of micelles is referred to as a microemulsion.
- Contaminants can partition into the interior of the micelle, thereby increasing the total aqueous solubility of the contaminant by a process referred to as micellar solubilization.
- The degree of solubility enhancement achieved by a surfactant can be characterized by the micelle-water partition coefficient and the molar solubilization ratio (MSR).
- Care should be taken in utilizing equilibrium partitioning relationships when designing a surfactant flood because the solubilization process is rate-limited for some systems.
- The degree of interfacial tension lowering required to mobilize NAPL can be characterized by the capillary number, the bond number, and the total trapping number.
- The distribution of surfactant and fluid phases in a surfactant-water-NAPL system can be characterized by ternary phase diagrams. Depending on the surfactant selected and the aqueous phase chemistry, either a Winsor Type I, Type II, or Type III system will result. The Winsor Type III system is associated with a middle-phase microemulsion and ultra-low interfacial tensions.
- The performance of a surfactant in the subsurface is dependent on temperature, sorption, degradation, the aqueous geochemistry of the injection water, and the surface chemistry of aquifer solids.

AEM has successful experience implementing surfactant-aided soil washing at our clients' UST sites to achieve No Further Action status. If you have any questions regarding this technology, please contact Jeff Cook at AEM at 404-329-9006.

## Georgia EPD Proposes to Reissue NPDES General Permits

Georgia EPD—June 9, 2008

The Environmental Protection Division (EPD) of the Georgia Department of Natural Resources is proposing to reissue NPDES General Permits No. GAR100001, No. GAR100002, and No. GAR100003 for storm water discharges associated with construction activity as defined in the Code of Federal Regulations and the Georgia Rules and Regulations for Water Quality Control. The proposed NPDES General Permits will authorize the designated construction activities to discharge storm water into waters of the State of Georgia. The permit area of the proposed NPDES General Permits is state-

wide. The NPDES General Permits would be valid for a maximum of five years.

The proposed permits will authorize the discharge of storm water from sites where construction activities occur. The proposed permits define construction activities as those disturbing a land area greater than one (1) acre or tracts of less than one (1) acre that are part of a larger overall development with a combined disturbance of one (1) acre or greater (i.e., common plan of development). EPD can require an applicant to submit an NPDES permit application for an individual NPDES permit upon written notification to the applicant. In addition to storm water

discharges, the proposed general NPDES permits authorize certain non-storm water discharges such as firefighting water and uncontaminated groundwater. The proposed general permits will be valid for a term of five (5) years. The proposed permits comply with the anti-degradation requirements in the EPD Rules and Regulations for Water Quality Control, subparagraph 391-3-6-.03. The proposed permits are being issued pursuant to the authority contained in O.C.G.A. §§ 12-5-27 and 12-5-30.

EPD will hold a public hearing on July 11, 2008, at 9:00 a.m., immediately followed by a public meeting. The public hearing and

public meeting will be held at the Atlanta Tradeport Training Room located at 4244 International Parkway, Suite 116, in Atlanta, Georgia 30354. The purpose of the public hearing and public meeting will be to present and receive formal comments for the official record on the proposed NPDES General Permits for storm water discharges associated with construction activity.

AEM will follow developments related to issuance of the NPDES General Permits. If you have any questions regarding the proposed permits or their implementation, please contact Jeff Cook or Leona Miles at AEM at 404-329-9006.

## Formaldehyde Emissions from Composite Wood Products

U.S. EPA—June 23, 2008

EPA is launching a broad effort to gain a greater scientific understanding of the potential health risks of formaldehyde's use in pressed wood products. Through this process, EPA will develop risk assessments on the potential adverse health effects, evaluate the costs and benefits of possible control technologies and approaches, and determine whether EPA action is needed to address any identified risks.

The agency plans to issue an advance notice of proposed rule-making (ANPR) in fall 2008. The agency is pursuing this course of

action following review of a petition submitted under the Toxic Substances Control Act (TSCA). The petition requested that EPA adopt nationally a California regulation to control formaldehyde emissions from composite wood products and extend the rule to include composite wood products in manufactured homes.

EPA carefully reviewed the TSCA Section 21 citizens' petition, submitted by the Sierra Club, a number of other environmental organizations, as well as a large number of private citizens, and sought comment and

additional information on the petition. EPA will work closely with the Department of Housing and Urban Development (HUD) on issues related to manufactured housing.

Under TSCA Section 21, any person may petition EPA to initiate a proceeding for the issuance, amendment, or repeal of a rule under:

- Section 4—rules requiring chemical testing;
- Section 6—rules imposing regulatory controls on chemicals;

- Section 8—rules requiring information;
- Section 5(e)—orders affecting new chemical substances; or
- Section 6(b)(2)—orders affecting quality control procedures.

A petition must be filed, and it must set forth the facts that are claimed to establish the necessity for the action requested. EPA is required to grant or deny the petition within 90 days from the day the petition is filed. If EPA grants the petition, EPA must commence a proceeding. If EPA denies the petition, the reasons for denial must be published in the Federal Register.

## Listing Amendment for F019 Wastewater Treatment Sludge

U.S. EPA—June 2008

EPA is amending the F019 hazardous waste listing to facilitate the use of aluminum in automobiles, light trucks, and utility vehicles. Using aluminum parts produces lighter vehicles capable of increased gas mileage and decreased exhaust air emissions, including a reduction in the emission of greenhouse gases.

Aluminum automotive parts must go through a metal finishing or conversion coating process

before being used in motor vehicle manufacturing. This process generates F019, an F-code listed waste, which must be managed and disposed of as a hazardous waste. F019 is one of the F-code hazardous waste listings generated from common industrial and manufacturing processes.

This amendment exempts F019 waste from being considered a hazardous waste on condition that the waste is not placed outside on the land prior to shipment to an appropriately lined

landfill. This approach encourages the use of lighter aluminum parts in motor vehicles, while protecting human health and the environment. The motor vehicle industry has incorporated aluminum into vehicle parts and bodies since the 1970s. Between 1997 and 2007, EPA granted 19 petitions for individual U.S. plants to exempt F019 from regulation through a rulemaking process called "delisting." This rule responds to the Alliance of Automob-

ile Manufacturers and the Aluminum Association, which petitioned EPA to standardize the F019 listing for all motor vehicles manufacturing plants and remove the barriers to using aluminum in automotive manufacturing.

The Federal Register Notice for this listing amendment was published June 4, 2008, and can be found on the web at [www.epa.gov/fedrgstr/EPA-WASTE/2008/June/Day-04/f12483.pdf](http://www.epa.gov/fedrgstr/EPA-WASTE/2008/June/Day-04/f12483.pdf)

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

**Contact Us:**



**2580 Northeast Expressway  
Atlanta, Georgia 30345  
Phone: (404) 329-9006  
Fax: (404) 329-2057**

**Email: [janet-hart@aem-net.com](mailto:janet-hart@aem-net.com)**

*Please visit us on the web:*

**[www.aem-net.com](http://www.aem-net.com)**

## **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 Antares Foundation, the Humane Society of the United States, the Society for the Prevention of Cruelty to Animals, and CARE.

---

**Atlanta Environmental Management, Inc.**

**2580 Northeast Expressway**

**Atlanta, Georgia 30345**