



Vol. 28, No. 3

Update to Clients

Update

Natural and Enhanced Bioremediation Applications to Large Spills & Local Projects

During the Kuwait-Iraq War of 1991, approximately 150 million gallons of crude oil spilled into the Persian Gulf. The slick traveled south where much of it washed ashore on the Abu Ali peninsula in Saudi Arabia. Although the Abu Ali peninsula was the most impacted segment of the coastline, most of the Saudi coast was affected to some degree.

In spite of the many issues that have arisen over recent months regarding how to manage and clean up the massive amounts of oil spilled into the Gulf of Mexico by the explosion at BP's Deepwater Horizon oil rig, there is substantial scientific understanding of methods of cleaning up spilled oil. The problem in the Gulf is complex -- the well location is deep, the quantity of oil spilled dwarfs most other spills, the coastline is full of complex and delicate salt marsh ecosystems.

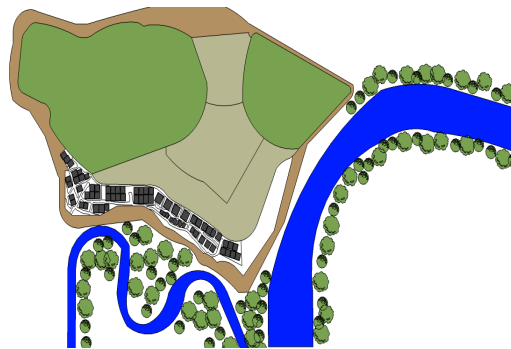
The spill in the Gulf of Mexico shares some characteristics with the spill in the Abu Ali peninsula, but it differs in several respects as well. Perhaps most notably, both spills occurred in warm climates. Temperature has a dramatic impact on how

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SAI Assists NERC Middlesex Solar I, LLC, with Design and Installation of Solar Panels at Edgeboro Landfill

SAI recently provided landfill expertise to NERC (North American Electric Reliability Corporation) Middlesex Solar I, LLC (NERC) for the design and installation of solar photovoltaic (PV) panels on the surface of the closed and capped Edgeboro Landfill in Middlesex County, New Jersey. The portion of the landfill selected is approximately twenty-seven acres and faces south, to maximize the amount of sunlight on the panels. NERC intends to install approximately 9,000 solar PV panels, which are expected to generate roughly four MW of electricity. The resulting "green" energy will be sold back to the power grid.

SAI's thorough knowledge of the landfill's cap cover design, grading and existing engineering controls proved invaluable in the design of the solar array. In addition, SAI assisted NERC with developing a site plan that optimized the area for the solar installation. SAI's experience in landfill stability and settlement analysis was helpful in assessing the appropriate solar panel stabilizing technique. Staff



Above, an artist's rendering of the solar PV panel installation design (shown in black) at the Edgeboro Landfill in Middlesex County. The Raritan River is on the right, the South River is on the left, and the solar array is above the South River. Below, a photograph of the panels situated on the slope of the landfill.



engineers also performed a veneer stability analysis to determine how best to prevent the solar panels from sliding along the side slopes of the landfill. Finally, hydraulic capacity calculations were performed to determine whether the solar installation would require enhancement of the stormwater management system.

SAI is obtaining the required permits for the project, including a Disruption of a Solid Waste Facility permit from the NJDEP and an SESC certification from the Freehold Soil Conservation District. The firm is assisting NERC with obtaining the Approval of the East Brunswick Township Planning Board.

Clean and green energy generated by these solar panels will supplement the energy soon to be generated at the landfill from the combustion of landfill gas. Generation of energy by two renewable energy sources

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Groundbreaking ceremony for new Mercer Courthouse. *see page 2*
Latest Developments in LSRP. *see page 3*



SAI Invited to Groundbreaking Ceremony for New Mercer County Courthouse

Solar Panels

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simultaneously at the site will serve as a model of sustainable energy production for sanitary landfills across New Jersey and the United States. SAI is proud to be a part of these cutting-edge energy initiatives at the Edgeboro Landfill.

Oil

Bioremediation

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nature responds to oil that seeps into a marine/wetland ecosystem, which in turn provides clues to us about how to manage such cleanups. At both sites, naturally-occurring bacteria that consume oil can be found in the ecosystem. These bacteria respond to elevated levels of petroleum in the environment by stepping up their metabolic processes to break down the oil. This has been happening for some time to the oil in the Gulf of Mexico.

However, this spill differs from the spill in Abu Ali in that those naturally-occurring bacteria are located around fissures on the ocean floor. Because this oil slick is pervasive throughout the water column, the impact of the bacteria is unclear. Also, the oil in Abu Ali made landfall rather quickly, whereas in the Gulf of Mexico, because of the depth of the water at the spill site,

The Mercer County Court House is perhaps one of the best known buildings in Mercer County. This impressive sandstone building, with its pediments, columns and arches, occupies an important downtown location, but, unfortunately, it is not equipped for business in the 21st century. In order to continue serving the public in the most efficient manner possible, the Mercer County Improvement Authority (MCIA) commissioned the construction of a new courthouse directly behind the current criminal courthouse, which is located at South Broad and Market Streets in downtown Trenton. It is the largest public project in Mercer County history.

For years, a parking garage stood behind the existing courthouse on the footprint of the site for the new courthouse. Once the garage was demolished, SAI was retained by the MCIA to perform a geotechnical subsurface analysis of the proposed building site, and as a result was invited to the groundbreaking ceremony held on June 2 of this year. SAI Vice President for Geotechnical Services, Dr. Amira Fahim, P.E., and

Project Manager Randy S. Kertes, CPG, PG, oversaw the geotechnical and geohydrologic work for this project.

SAI's tasks for the MCIA included performing a complete subsurface evaluation, designing both deep and shallow foundations (to provide flexibility to the building's planners and architects), and summarizing the findings and designs in a comprehensive Geotechnical Report.

According to Mercer County Executive Brian M. Hughes, "This 141,000-square-foot building will be one of the most progressive, environmentally friendly structures in the state, and will boost [Mercer's] economy by creating hundreds of construction jobs. In addition, the new courthouse will provide a healthy and modern environment for the many employees who will work there and the public that will visit." SAI is proud to have participated in such an



From left to right are Brian Hughes, Mercer County Executive; Wayne DeAngelo, President of the Mercer/Burlington Building Trades Council; the Honorable Linda Feinberg, Mercer County Assignment Judge; and John Thurber, Chair of the MCIA.

Oil Bioremediation

the oil is taking longer to reach the coastline.

SAI was retained by the Royal Commission for Jubail & Yanbu, Saudi Arabia, to assess the extent of the contamination from the spill and analyze the feasibility of using bioremediation techniques to clean the con-



An artist's rendering of the new criminal courthouse building.

taminated sediments. [To read the complete history of this project, please go to our website, www.sadat.com.] SAI performed a feasibility study to examine different methods of bioremediation, including the addition of nutrients to increase the rate at which the

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Please Join Us

Once again, SAI will be hosting a booth at the 2010 League of Municipalities conference in Atlantic City from November 15 - 19. While you're making the rounds, stop by booth 746 and say Hello!

Latest Developments in LSRP Program

In the wake of the implementation of the Licensed Site Remediation Professional (LSRP) program a year ago, reform efforts are underway to align and coordinate guidance documents with the new regulations. The next step in the process is the complete re-writing of the Technical Requirements for Site Remediation (TRSR).

The initial version of the TRSR adopted in 1993 was relatively short in length and focused on a performance-oriented process. At the time, this was a significant departure from an entirely site-specific process where two projects on the same block could have completely different requirements. Seventeen years later, the TRSR have grown to 202 pages in which NJDEP has attempted to regulate every possible scenario. In many cases, the regulatory roadblocks have kept resolvable cases from reaching a conclusion.

The purpose of the reform is to reduce the existing regulations to the minimum NJDEP enforceable requirements, while the specific method(s) of achieving compliance are transferred from regulation to guidance. This will give the LSRP the opportunity to derive his or her own site specific rationale for compliance and issuing the Response Action Outcome (RAO). NJDEP cannot rescind the RAO if the final remedy is protective. At this time, NJDEP has established two stakeholder committees, one for the TRSR itself and another for the guidance. The guidance stakeholder committee is divided into fifteen small subcommittees to deliberate on the specific documents. Some of these, such as vapor intrusion, have included an ongoing effort to revise existing guidance. Other areas, such as the need to develop guidance for clean fill certification, will now have guidance for the first time.

Oil Bioremediation *Continued from Page 2*

bacteria could process the oil, and adding more and different, non-native bacteria to the environment. This second process is known as bioaugmentation. After the results of the feasibility study were compiled and analyzed, SAI provided the Royal Commission with a recommendation that focused on a combination of bioremediation methods designed to speed up the cleanup efforts. The Royal Commission adopted these recommendations, and the clean-

The end result will be that, under the direction of a competent and informed LSRP, moving a case forward will become less restrictive, provided that the basic tenant (assuring that a protective remedial alternative has been adopted) has been met. The Site Remediation Reform Act established a hierarchy of stature, regulation, and guidance for LSRPs to follow to issue the RAO. Should the LSRP choose to seek a variance from existing regulation or deviate from the established guidance, then the NJDEP will be consulted regarding the rationale and methodology.

Clear, definable change is happening with the implementation of the LSRP program. Change is not necessarily a bad thing and it is certainly necessary in this case, but it is also fraught with potential pitfalls and dangers. The transition to the LSRP program will be one of continued change as the business adjusts to the expectations and liabilities of the program. As existing guidance is revised or new guidance is developed, your LSRP will have the tools and wherewithal to adapt within the context of the statutory and regulatory structure. Close coordination with NJDEP and the Licensed Site Professional Remediation Association will be needed to understand the new paradigm. SAI's LSRPs are working with NJDEP and the LSRPA to provide our clients with the most current information available.

Rodger Ferguson, CHMM, LSRP, has issued three RAOs to date for two separate sites. Rodger is an active member of the LSRPA, the NJDEP TRSR Stakeholders committee and the NDJEP guidance committees for analytical methodology and alternate and clean fill materials, the latter of which he co-chairs. You can reach Mr. Ferguson at rferguson@sadat.com.

up was successful.

Because of its successful experience in a major bioremediation project, SAI has recently established a Joint Venture with Green Arrow Brands, LLC (GAB), of Dumont, New Jersey, a specialty bioremediation designer and cleanup contractor. GAB has

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LSRP News Flash

NJDEP is actively sending letters to those with existing ISRA cases stating that their case manager has been reassigned and recommending that they opt into the LSRP program immediately rather than wait until the May 2012 deadline. At printing, 250 existing cases have been solicited and more will follow. NJDEP is taking this action because of dwindling staff resources and to focus their case management efforts on Immediate Environmental Concerns and other high risk cases. Submissions for No Further Action may still be made up until the deadline, but NJDEP will not promise that the original case manager will review the submission, resulting in higher oversight fees.

SAI Employee Instructs at Rider

Randy S. Kertes, CPG, PG is an adjunct instructor at Rider University and is teaching oceanography this fall. Randy keeps it "fresh" by inviting guest lecturers from governmental agencies and private industry to discuss coastal processes/topics specific to New Jersey. He also presents special lectures detailing current events such as the Deepwater Horizon oil spill and the

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Photograph of marine sediments contaminated with spilled crude oil in the Persian Gulf.

SAI Teacher

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Delaware River dredging project. Randy will be instructing environmental geology in the spring of 2011 and will continue to bring his practical experience to the classroom.

Welcome!

Dr. Aziz joins SAI in the Engineering Department. He holds a Ph.D. and an M.A. in Geological Sciences from Columbia University, and a M.S. in Geology from the University of Dhaka, Bangladesh. Dr. Aziz's doctoral research focused on understanding the subsurface processes that control the transport & fate of arsenic in the groundwater of Araihasar, Bangladesh. He has a strong background in physical and contaminant hydrogeology, and his specialties include hydrogeological and geochemical investigations, groundwater modeling, GIS and remote sensing and geostatistics.



Zahid Aziz

SAI Scientist Cycles Through Southern Africa

In June 2010, SAI scientist Dr. Il Kim embarked on an 800-mile self-contained bicycle tour through northern Namibia and Botswana. Dr. Kim has had a long-standing interest in Africa, and has visited western and central Africa on previous trips. She chose southern Africa for her most recent adventure to gain insight into the various cultures of the Okavango area, including the Mbu-kushu, Subiya, Biyeyi, Herero, and Tswana peoples.

Due to the culturally immersive nature of bicycle touring she was able to experience the region on a very personal level and subsequently gained a great deal of knowledge about the locals and their way of life. "While the countless languages, artistic styles, musical forms, and architectural variations were endlessly stimulating, it was the warmth and hospitality of the people I met along the way that made the trip most memorable," stated Dr. Kim.



Top photo, Dr. Kim greets a local woman in Namibia; below, passing an elephant crossing sign in Botswana.

Congratulations!

SAI would like to announce that Lisa Thompson has been promoted to Director of Marketing for the firm. Lisa has been with SAI for three years and, among her other duties, serves as editor for this newsletter. Her promotion and assumption of responsibility for the day-to-day functioning of the tasks of the Marketing Department allow senior management to focus less on administrative duties and more on client development for the company. SAI would like to congratulate Lisa, and we are looking forward to working with her in her new role.

Multi-Lingual!

Just for fun, we took a quick office poll recently to find out just how many languages we speak here at SAI. Among our staff we have some level of knowledge of 19 world languages! They are, in no particular order:

- English
- Arabic
- Yiddish
- Hindi
- Gujarati
- Malayan
- Tamil
- Kannada
- French
- Spanish
- Quechua
- Russian
- Ukranian
- Polish
- German
- Turkish
- Italian
- Korean
- and a little Gaelic

In addition to languages, several staffers claimed fluency in certain dialects, including American, Triniglish (from Trinidad), Kiwi, and the locally popular Eaglease.

Oil Bioremediation *Continued from Page 2*

the proprietary bioremediation products and expertise needed to design bioremediation projects properly. Working together, SAI and GAB will bring the benefits of using enhanced natural processes for soil, groundwater and marine environments to petroleum cleanup projects.

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From the Editor -

If you would like to receive a full-color electronic version of our newsletter in Adobe PDF format via email, or if you want additional information about SAI and its services, please email me at: lthompson@satad.com.

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Thanks — we look forward to hearing from you.