

BIO SOLIDS NEWS

News and Information from the Virginia Biosolids Council • November 2013



Ed Wallis, Stafford Regional Airport director, shows areas earlier treated by biosolids.

Biosolids rehabilitate soil at Stafford airport—*again*

It's not unusual for a challenge or two to surface when doing site development for a major commercial or industrial construction project. What is unusual, however, is to uncover large amounts of acid sulfate soil, which results in acres and acres of barren land that will not support any vegetation.

When the topsoil is removed, the sulfides oxidize to produce sulfuric acid, iron oxides/hydroxides and sulfate precipitates. The resulting soil is highly acidic (pH less than 4.0), and is often associated with acidic, metal-laden surface runoff.

This was the problem in Stafford County in 1998 during the development of the area's new regional airport, which sits atop one of the major acid producing geologic formations in the Commonwealth.

After conventional landscaping efforts failed, the Airport Authority asked Virginia Tech soil scientists to analyze the problem and develop a rehabilitation program to remediate the acid sulfate soil and promote the growth of a vegetative cover.

"It was an important effort for us," said Ed Wallis, airport director, "since we could not just stand by and watch the acid damage our facilities, erode the soil and impact

natural habitats. Much of the site looked like a wasteland, which was certainly not the impression of the county we wanted to give those flying into the airport."

After much discussion and deliberation, the Airport Authority decided to implement a plan that utilized lime-stabilized biosolids to raise the pH and add organic matter to the soil. The application rates were based on the amount of lime in the biosolids that was needed to raise and permanently stabilize the pH, rather than on nitrogen rates, which are used for agriculture. The material was incorporated into the soil and seeded once in late spring and then again in early fall due to drought. Tech scientists monitored the project.

The application of biosolids was met with some resistance by the public, said Wallis, mainly because of concerns about odor. The result, however, was the establishment of productive topsoil over much of the site and a lot of lessons learned from that initial application.

"I became a true believer in the benefits of biosolids after our work on the site proved so successful," said Wallis. "But the experience also taught us to be much more proactive in our future community relations."

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The Virginia Biosolids Council supports the recycling of biosolids in Virginia through information and education on the beneficial use and safety of biosolids. The Council is supported by municipal wastewater treatment plants, land application and composting companies and biosolids users, and is available as a resource to those who need information about the recycling of biosolids.

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This fall, biosolids were again applied at the Stafford Regional Airport site to remediate small areas that were still suffering from the acid sulfate soil, mainly slopes, and to add nutrients to soil that had become vegetated after the 2002 biosolids application. Some areas had also been disturbed by recent construction and required another round of treatment.



Acid sulfate runoff can damage concrete and metal and affect local water quality. Note the brown water and stains on the concrete.

Dr. Lee W. Daniels, professor of environmental soil science in the College of Agriculture and Life Sciences at Virginia Tech, who was involved with the initial application, and his team were asked to develop a prescriptive plan for the site. The approval of this plan involved state regulatory agencies, including the Department of Environmental Quality (DEQ), which oversees biosolids regulations, and the Department of Conservation and Recreation (DCR), which oversees nutrient management planning.

According to Dr. Daniels, approximately 20 acres that were still suffering from acid sulfate runoff received the higher lime application rate. Another 320 acres, which had been earlier remediated and had good stands of grass, received an agricultural rate of biosolids, which was based on the nitrogen needs of the grass.

“This time, the slopes have responded well to the biosolids and have produced good stands of grass,” he said, “However, we do have to monitor carefully to make sure that the results last.”

Fall application of the biosolids and seeding contributed to the good results, according to David Simons, vice president of Nutri-Blend, Inc., the application project manager and permit holder. Simons said that biosolids application took place during September and October, an ideal time for the germination of cool weather grass seed and the establishment of strong root systems.

Application was done by Milton Wright Trucking, a land application company based in Woodbridge, VA.

“We had great weather, and our contractors did a great job making sure the material was applied and incorporated into the soil each day,” Wallis said. “The results will not only benefit the airport, but will greatly benefit our

neighbors and the environment by preventing the runoff of acid sulfate into nearby streams.”

During the application there was only one odor complaint, said Wallis, which was immediately investigated by DEQ, which found no offensive odors from the biosolids. Most of the biosolids were produced by the DC Water Blue Plains treatment facility, which has invested millions of dollars during the past few years to reduce off-site odors to nearly non-detectable levels. A smaller quantity came from the Washington Suburban Sanitation Commission’s Piscataway treatment plant in Prince Georges County, MD.

Wallis attributes the positive response from the community to advance planning and implementation by all the parties involved in the project. “We wanted to make sure that everyone was completely aware of our plan, so we made sure that all of the parties were on board—the Airport Authority, local officials, state officials, our contractors and the public utilities providing the biosolids. We went to great lengths to communicate our action plan to our neighbors and the larger community,” said Wallis.

The Stafford airport is a 550-acre facility that can accommodate 75,000 annual operations and 100 based aircraft, including corporate business jets. It is owned and operated by the Stafford Regional Airport Authority, an independent authority comprised of representatives from Stafford and Prince William Counties, and the City of Fredericksburg.



A spreader applies biosolids to barren land at the Stafford Regional Airport. The rate of application is much higher than for agricultural land in order to raise the pH of the acidic soil and provide organic material. The biosolids are incorporated into the soil immediately after application.

Information on the Stafford Regional Airport can be found at: www.staffordairport.com

Information on the remediation of acidic sulfur soils can be found at: www.landrehab.org

For more information, go to www.virginiabiosolids.com



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