

Fuel Facility Expansion Uses Smart Paks to Protect Local Waterways

Case Study

Midsized Airport

This International Airport offers a wide-range of facilities and services, handling an average of 110 commercial arrivals and departures daily.

With a terminal designed to accommodate 1.5-million enplanements annually, the airport's Capital Plan aims to improve and maintain safety and to meet the needs of air travelers and air carriers well into the 21st Century.

With a history of being environmentally proactive and seeking cost effective solutions to stormwater pollution. The airport is widely known for its state-of-the-art Stormwater Recovery and Treatment Facility, an aircraft de-icing mitigation system that uses micro-organisms to digest propylene glycol. The process produces methane gas, which is reused as fuel to heat the incoming fluid and to speed its processing. The gas is also used to heat the treatment facility.



Project Challenge

In a concentrated effort to mitigate the effects of stormwater runoff resulting from a major upgrade to a bulk fuel facility, this international airport installed a high capacity stormwater pretreatment system featuring Smart Sponge® technology, an innovative passive absorption filtration media developed by AbTech Industries. The new system was completed in the summer of 2007 and exceeded State Pollutant Discharge Elimination System (SPDES) requirements for stormwater treatment.

A major design challenge was meeting the existing SPDES permit stormwater discharge standards for discharging large volumes of processed stormwater into a local creek, a sensitive receptor leading to a downstream drinking water intake. "The new tank dike and refueler staging area potentially increase the annual volume of stormwater processed by a factor of four," stated an engineer in private practice who served as the airport project manager for the upgrade as well as design of the stormwater management system. "This required a complete redesign of the bulk fuel facility stormwater management system." He pointed out that the traditional filter media used to absorb hydrocarbons from water for stormwater pretreatment included charcoal or Imbiber Beads, but these were not suitable for high-flow stormwater installations typically needed in airports because of their high cost and flow resistance. More scientific developments, such as the proprietary polymer technology, trademarked Smart Sponge® developed by AbTech Industries, paved the way to low-cost, high-flow rate absorption filter media.

Project Description

The Airport Authority implemented the bulk fuel facility upgrade to ensure that the international airport continues to be environmentally responsible while maintaining a reliable source of aviation fuels in all weather conditions for the foreseeable future.

The upgrade of the airport's bulk fuel refueling and storage facility included installation of a new 200,000 gallon jet fuel tank with high speed jet fuel loading and unloading pumps, a dedicated tanker truck unloading lane and a refueler staging area.

The basic design of high-capacity stormwater pretreatment system included trench-drain catch basins in the refueling areas which channel the flow of runoff through pipes to a stormwater lift station. The lift station then pumps the runoff to a vault that houses a bank of Smart Sponge absorption filters, AbTech's Smart PAK®, that effectively treat the runoff before it's discharged into surface waterways. AbTech Distributor, Clean Water Solutions, supplied the Smart Sponge® Technology filtration system, and it was installed by the project contractor.



AbTech Industries' Solution Ideal for Airports

AbTech Industries has combined a bacteria reducing agent in its filtration material that effectively reduces total coliform bacteria at the street level. The company is based in Scottsdale, Arizona, and provides communities, industries, and airports with customized solutions to control or remove petroleum products, while reducing total coliform bacteria that are threatening the quality of our nation's waterways. Several U.S. airports use Smart Sponge filtration systems to protect sensitive areas such as bulk fuel facilities and storm drains that discharge to sensitive water bodies.

The Environmental Protection Agency has included Smart Sponge technology as a Best Management Practice (BMP) under the federal environmental guidelines that apply to local and state governments. AbTech Industries has wide-ranging experience in designing and installing stormwater filtration systems at many airports and municipal stormwater systems.

Stormwater absorption filtration systems have a wide application in municipal stormwater systems. AbTech's Smart Sponge technology is currently deployed in 36 states and has proven effective in removing pollutants from flowing or pooled water, encapsulating them so they cannot be released back into the environment even under high pressure. Smart Sponge filters are typically saturated at about 250% of their dry media weight at the time of installation. The Smart Sponge technology filters are chemically selective, absorbing hydrocarbons and encapsulating fuel from the stormwater. The absorption is permanent and the saturated product does not leach or leak contaminants; rather, it transforms the contaminants into solid wastes with substantially lower disposal costs versus other systems. The result is a product that's recyclable and that provides a complete, closed-loop solution for hydrocarbon removal.

In addition, the filters are easy to maintain and replace. The bank of filters in the airport's pretreatment system can be accessed through double aluminum doors where they can be easily pulled out and weighed. The project manager has stated that under normal conditions, the filters are checked quarterly to assess their saturation level. One disadvantage of passive absorption systems is that they can be overpowered by a large spill of fuel – once they become thoroughly saturated, additional fuel could pass directly through them. In designing the airport's stormwater pretreatment system, the project manager added an oil stop valve upstream of the filter media to prepare for such an occurrence. "Most of the stormwater runoff from the aircraft refueling areas is clean enough to be processed by the Smart Sponge filters without oil separators, but we needed to prepare for all events."

The completed stormwater pretreatment system processes 250 gpm of stormwater with no bypass, ensuring that the entire flow is filtered and that the effluent quality meets the SPDES permit discharge requirements.

What Others are Saying about the Project

"AbTech's absorption filters can not only be used to polish the effluent from an oil water separator, but also can be used to replace the oil water separator in cases where the influent is relatively clean, thereby producing a superior effluent quality at a much lower capital cost," spill prevention and response program, if we don't get to a spill before it reaches the storm drain, the filters can handle them."

Airport Project Manager

For more information about the Smart Sponge® technology, visit www.abtechindustries.com or call.

