

CASE STUDY

Biolac® & SuperScraper®
Cincinnati/Northern Kentucky Airport



Deicing Fluid Run-off Treatment System

Overview

Airports located in cold areas have to face winter weather challenges. Ice and snow adversely affect aircraft capability to fly and maneuver on the ground.

At the Cincinnati/Northern Kentucky International Airport operations, propylene glycol and ethylene-glycol based products are used to deice airplanes. Acetate and formate-based products are used to deice runways and taxiways.

All these chemicals present in deicing materials exert a significant oxygen demand in the environment. Nearly a million gallons of deicing fluid are used during the winter at the Cincinnati / Northern Kentucky airport. If left untreated, this mixture of water and deicing fluid can cause prejudicial effects on the surrounding environment.

Challenge

At the application pad, deicing fluid is collected and recycled. However, during taxiing and takeoff, 20 to 40% of the fluid is lost from each plane. Stormwater and snowmelt result in up to 5 million gallons per day (MGD) or more of runoff containing as much as 30,000 pounds of biochemical oxygen demand (BOD), equivalent to the wastewater generated by 176,000 people.

If untreated, this contaminated runoff could pollute the groundwater around the airport property. Other potential environmental concerns include fish toxicity, odor problems, and soil contamination.

The existing wastewater treatment system at the airport, a sequencing batch reactor (SBR), did not perform well in colder weather when the

incoming wastewater temperatures fell below 8.5 Co.

The consulting engineer at URS in Cincinnati was tasked with finding a biological treatment system capable of handling a wide range of hydraulic and organic loadings at low temperatures while providing a low cost stand-by capability. The consultant was faced with comparing the cost of de-rating the existing equipment, doubling the capacity, and adding an equalization basin to meet the capacity. The second option was to install a Parkson solution to handle the total wastewater capacity, which would combine a Biolac® wastewater treatment and the SuperScraper® sludge removal systems.

The Biolac system is an innovative activated sludge process using extended retention of biological

solids to create an extremely stable, easily operated system. The capabilities of this technology far exceed ordinary extended aeration treatment, providing superior efficiency. The design ensures the lowest cost construction and guarantees operational simplicity.

The SuperScraper, on the other hand, is the most efficient, low-maintenance, bottom sludge scraper available. The SuperScraper's easy design and construction facilitate installation and minimize maintenance and power requirements.

Solution

After extensive evaluation, the URS engineer selected the Parkson solution. The Biolac system, was installed in three concrete basins, two with a volume of 5.5 million gallons each, and a smaller one with 3.0 million gallons.

In addition, Biolac clarifiers with the Parkson SuperScrapers were selected for settling the biomass, and controlling the return sludge. A total of 23 Biolac aeration chains were installed in the aeration basin, and a glycol feed system was incorporated to assure a food supply for the biomass during the low load and stand-by conditions. The existing SBR tanks were incorporated into the installation, by converting them into sludge storage reservoirs.

Installation was done during the summer and fall 2006 to be able to start the system for the winter season. No major complications were faced during the installation of the system and compliance was achieved immediately.

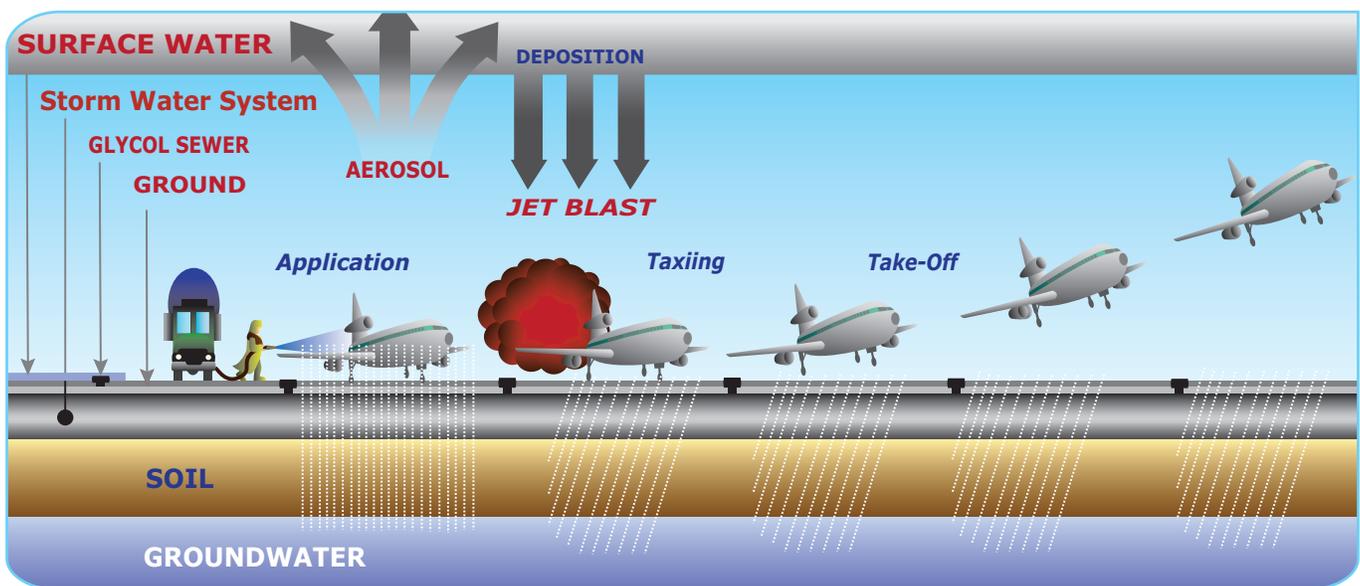
Results

The Biolac system has performed as designed since start-up during



the winter of 2006/2007. It has consistently met the 50 mg/l BOD discharge limit that was required, and the treated effluent is now directly discharged into nearby Gunpowder Creek, without adverse effects on the environment.

In fact, dissolved oxygen levels in the creek have increased and are now sustaining a healthy fish population. ■



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