

Washwater Compliance News™

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Unique Treatment System Helps Excavator Gain Environmental Compliance For Vehicle Wash Bay Wastewater

Bowmansville, PA — Management at a major excavator/earth mover here reports successful operation of a unique contaminant removal system that treats wastewater from the wash bay it uses for its dump trucks, bulldozers, excavators, backhoes, and other vehicles.

Based on a proven electrocoagulation (EC) process that features passing a controlled electrical current through the wastewater to help remove contaminants, the system was selected as the best technology among treatment alternatives considered. It replaced a sand filtration vault that was deemed inadequate for reliable compliance with new environmental regulations governing discharge from industrial washing facilities.

“There’s no treatment system you can just put in there and forget about if you want compliance, but we believe we’ve gotten as close to that ideal as you can get with this system,” stated Richard Deeds, fleet manager for Brubacher Excavating, Inc. “It’s been working well for over a year now.”

The EC System™ technology is available through Stormwater Management Inc. (SMI) of Portland, Ore. It was installed here in March, 2003 at the same time Brubacher was adding a second high-pressure washer.

“After reading about the regulatory changes going on regarding washwater like ours, we wanted to improve on what we had before any compliance problems developed,” Deeds continued. “Since we still had no public sewer access, we knew we were staying with recycling the wash water. But we heard from others in our industry that when chemical additions and filtration were introduced for better performance, the result was a very heavy maintenance burden, with extensive daily attention required. So we were glad to hear there was this alternative available, and we had the opportunity to see it working well at a vehicle wash facility with higher volume than ours.”

Wash Bay Operation and Wastewater Treatment

Brubacher performs a full range of excavating, pipe and utility installation, roadway construction, and general earth moving activities, as well as related site development services. The company’s Class 8 dump trucks and tractors account for the most frequent use of the wash bay. Heavy earth moving equipment brought in for repair is the next most common use, followed by the firm’s pickup trucks and SUV’s.

Manually-operated, wand-type high pressure washers are operated at 4 gal/min and 3000 psi, utilizing recycled water for washing and fresh water for rinsing. Present annual usage is about 1600 hours.

The washwater in the 100-ft. long, enclosed wash bay flows down through a 5-ft. wide steel grate into a 32-in. deep pit that



Washwater in the 100-ft. long wash bay flows down through a grate into a pit that gravity feeds to a grease-trap sump. The water is pumped from there into the EC System.

gravity feeds to a grease-trap sump. When the facility was installed as environmentally compliant in 1988, it was set up with pumping of the wastewater from the sump into a sand filtration vault. There, contaminants were removed as they passed through layers of stone and sand, which in turn had to be periodically replaced to regenerate removal capacity.

Now, the wastewater is transferred from the sump into the new system, where it moves through stages of electrocoagulation, separation, and evaporation. Periodic vacuuming and disposal of about 2000 gal of water and mud in the original receiving pit continues as an ongoing part of the revised wastewater system.

“We wanted to be in compliance in advance of any attention by the regulatory authorities, so we undertook a major testing program to see where we stood with the contaminant parameters used by our county,” Deeds recalled. “The results showed we were in good shape with most of the list, but questionable with some. So we moved forward to get better.”

Deeds noted that operational issues with the previous system were also a factor.

“The original load of sand and stone in the vault lasted about four years before we had to replace it,” he said. “But our fleet was growing by about 5% a year, and had doubled by last year. Wash bay use was increasing accordingly, causing heavier loading on the sand.”

“We had also started using citric acid type solvents for cleaning, which emulsified oils so they passed through the grease trap, further loading the sand. The last time we emptied the vault, the

sand had only lasted about two years and nine months, and we realized that the operational costs were going to keep rising.”

New Treatment System

Deeds estimated that operational costs for the new system were presently about the same as for the previous system. But the costs for the new system are expected to decrease, while costs for the previous system would have increased.

“Previously, when the sand had reached its filtration capacity, it would take two or three of our guys about three days to dig up three truckloads of sand and stone, and then we had to pay a lot to have it hauled away,” he explained.

“With the new system, we have comparable out-of-pocket costs, deriving from replacement of the sacrificial anodes in the electrocoagulation cells; propane needed for the evaporator; and electricity. But anode costs have already come down a great deal from the original, plus another 10% on the most recent replacement, and should be coming down more as they develop longer-lasting anodes. Meanwhile, the new system is a lot less labor intensive. In addition, we went with the option to add an ozone generator to help minimize any odor, which appears to be working.”

“You change two cells at a time, which takes about an hour, and we’ve done that only twice for each in the first 13 months of operation,” he continued. “Once a week, we take a half hour to clear the evaporator. Other than that, we just check it briefly on a daily basis to confirm it’s all working as it’s supposed to.”

He said the capital cost for the new system had been deemed justified as a long-term investment for the company.

“We’re continuing to grow, and we needed to account for compliance for the foreseeable future,” he said. “We also checked with the state to assure the system did not require a permit to



pH-adjusted stream moves between two banks of electrocoagulation cells, where it is exposed to a controlled electrical current. Charged contaminant particles bond together. Masses comprised of emulsified petroleum elements float, while masses containing heavy metals settle.



Influent to the EC System moves through stages of electrocoagulation, separation, and evaporation. pH is adjusted in a holding tank before it is pumped to the EC cells.

operate. We’re expecting the new system, which is state-of-the-art, to last for many years, hopefully as many as 15.”

EC System Operation

The Stormwater Management Electrocoagulation System™ (EC System™) is designed to remove emulsified oils, total petroleum hydrocarbons (TPH), suspended solids, and heavy metals, resulting in water that is clean enough for reuse or discharge. It is applied as a single-method capability for removing contaminants within a range of influent waste stream concentrations, compositions, and complexities. The system is fully automatic, to help minimize maintenance costs.

In typical operation, the pH of the input stream is often adjusted in a holding tank before it is pumped between two banks of electrocoagulation cells, where it is exposed to a controlled electrical current. Charged contaminant particles bond together, emulsions of oil and grease are electrolytically broken, and heavy metals are oxidized to insoluble particulates. Micro-bubbles generated in the process float the contaminants to the surface, where they are skimmed off. The stream then moves to a separation unit for removal of any remaining floc, and then the solids are directed to the evaporator.

Systems are available to treat 5-130 gpm in a variety of marine, industrial, and commercial applications. Typical removal efficiencies are listed as lead, 97%; copper, 99%; zinc, 99%; BOD, 85%; TPH, 99%; and oil and grease, 98%.

The EC System complements another of the company’s stormwater filtration products, Stormwater Management StormFilter®, by generating consistent, high-quality effluent on higher strength wastewater, also without the use of chemicals.

Stormwater Management offers additional products for industrial applications, including the StormScreen® and StormGate Separator™. For further information, contact Stormwater Management Inc., 12021-B NE Airport Way, Portland, OR 97220, Tel. 800/548-4667, Fax 800/561-1271, industrial@stormwaterinc.com, www.stormwaterinc.com.