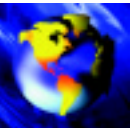




System Application



SMITH & LOVELESS INC.

www.smithandloveless.com

Chemical Plant's Groundwater Problem Gets Solved FAST[®] by S&L



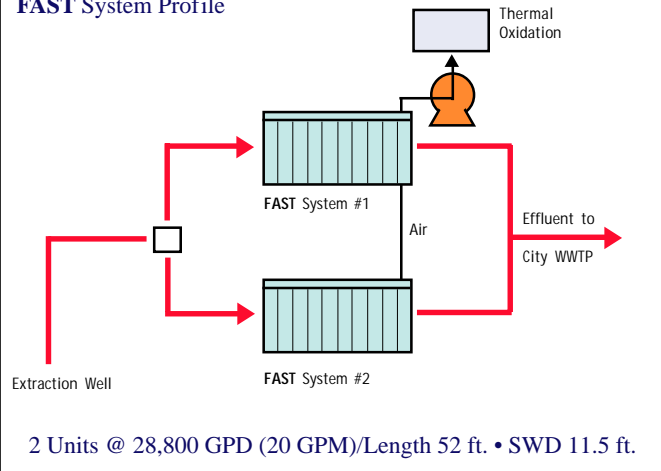
Application Profile: Plastics MFG./Michigan
S&L Equipment: FAST[®] WWTP
Installed: 1993

A petrochemical facility in Michigan discovered that paint residue and solvents had been leaking into a nearby aquifer. Included in the contaminants were Acetone, Toluene, Methyl Ethyl Ketone, and Xylene. The level of contamination varied slightly, but overall it was considerable. **Table 1** demonstrates the initial COD levels of the contamination with a summary of concentrations in mg/L. After many weeks of study, the hydrogeological conditions were established and a cleanup plan was formulated. Several methods were discussed at length, including steam stripping, U-V peroxide, suspended growth and rotating biological contacters. Instead, the group chose an above-grade, fixed-film biological treatment system with in-situ vapor recovery.

The fixed-film process selected to solve the contamination problem was the **FAST** process, designed and manufactured by Smith & Loveless Inc. It was able to meet the following important criteria during a 60-day pilot test: (1) Flexibility in loading (2) Low sludge production (3) Physical space constraints (4) Cost. The **FAST** bacteria are "fixed" to the system's media, increasing the sludge age. This longer sludge age results in *flexibility* (bacterial resiliency) when shock loads occur. It also *produces far less sludge for disposal* than alternative processes because the bacteria are thriving on the media and are not suspended in the wastewater. Less sludge is produced because of the density, allowing secondary bacteria to metabolize the sludge. Because the **FAST** process increases the bacterial concentration, the required tank sizing is lessened. Therefore, *physical space demands* are significantly less than typical activated sludge processes, potentially reducing *capital expenditure* for materials and site.

The complete submittal, fabrication and delivery time took a mere 14 weeks. Because the **FAST** units were pre-engineered and factory-built, little field work was required for final installation (prior to start-up). Most important, however, were the results the new system achieved. **Table 2** demonstrates the success of the system, which was better than anticipated. Contaminant concentrations in the effluent sent to the city were below detectable limits, resulting in removal efficiency of 99.96% and better.

FAST System Profile



FAST System Design Parameters and Profile

Table 1 — Initial COD Levels Influent Concentrations (mg/L)

Constituent	Avg.	Max.
Acetone	1120	3500
Ethylbenzene	3	7
Isopropanol	380	2600
MEK	260	800
4-Methyl-2-Pentanone	13	60
Toluene	290	450
Xylene	5	30
Methylene Chloride	<10	10
Trichlorethylene	2.5	2.5
COD Total	5500	7500

Table 2 — Effluent COD Levels

Constituent BDL	Avg. in PPM
Acetone	<0.050
Ethylbenzene	<0.001
Isopropanol	<0.300
MEK	<0.050
4-Methyl-2-Pentanone	<0.500
Toluene	<0.001
Xylene	<0.001
Methylene Chloride	<0.005
Trichlorethylene	<0.002
COD Total	30

E-mail: answers@smithandloveless.com • Phone: 913.888.5201 • FAX: 913.888.1017

Smith & Loveless Inc. System Innovators for global pumping, water and wastewater treatment