

Bio²Bloc System Removes Ammonia During Cold Season at Elverson, PA

The Borough of Elverson, PA is located in south central Pennsylvania. A quiet rural community, the WWTP was built to serve the needs of the small population base and surrounding business. The plant was constructed to support a designed flow rate of 75,000 GPD. BOD coming into the system averages 240 mg/L and influent ammonia averages 30 mg/L. After many years of successful performance, Pennsylvania's Department of Environmental Protection reduced ammonia discharge limits to 1.5 mg/L and 4.5 mg/L for the summer and winter respectively.

The plant's flow is channeled through three lagoons. Total plant capacity between the lagoons is approximately 3.6 million gallons with a retention time of approximately 48 days. Each of the lagoons is equipped with a small 10HP floating aerator (splasher). The system has never failed to accomplish BOD removal within permit limitations since its inception. With a reduction in NPDES limits for effluent ammonia, however, the Borough had to seek a method of removing the extra ammonia – particularly during cold weather months when system effluent can contain as much as 20 mg/L of ammonia. Working with the borough's engineers (Spotts, Stevens, & McCoy of Reading, PA) the decision was made to install FBC's Bio²Bloc system.



The FBC Bio²Bloc system was based on the use of seven Bio²Bloc floating modules. Powered by a single 5HP positive displacement blower, the system was installed in two days by a factory installation crew. The system was designed to provide sufficient fixed-film nitrification capacity to bring effluent ammonia below NPDES limits. Media beds were pre-seasoned for faster formation of the bio-film necessary for nitrification. The system was installed in mid March, 2002. Water temperature was at 4 °C and the ammonia effluent was 15 mg/L. By the first week of April, ammonia effluent levels were under 1.5 mg/L - **meeting their summer limit with water temperatures of 5 to 7 °C!**