

A Proven Process

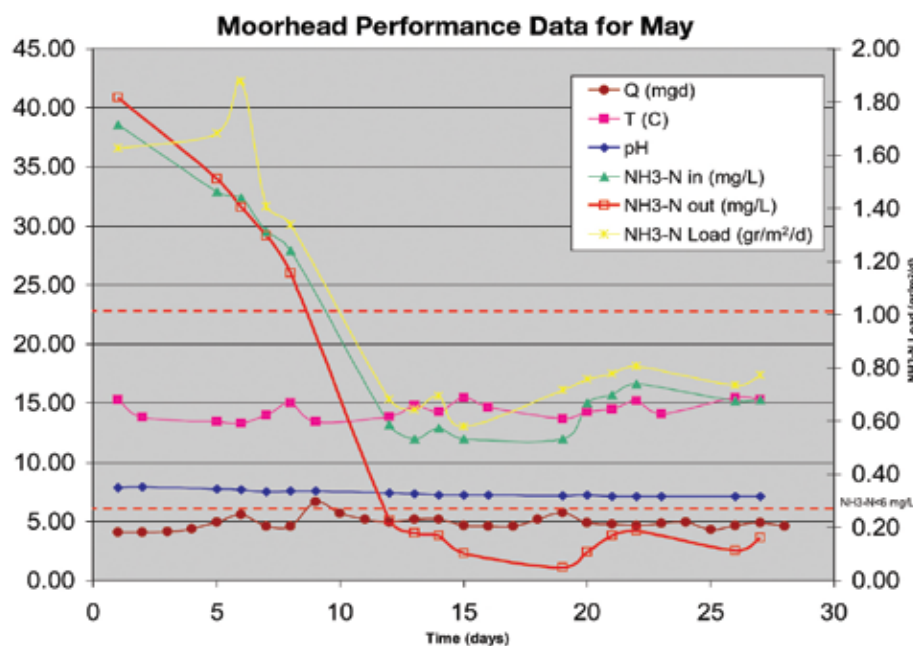
By Jack Gardiner

Moorhead Wastewater Pollution Control Facility (WPCF), located in Moorhead, Minn., is one of the oldest installations using moving-bed bioreactor (MBBR) technology to clean the wastewater generated in its community, treating 6 million gal per day of wastewater.

Through a comprehensive evaluation of technologies conducted in 2002, the Headworks Bio ActiveCell media and the innovative design process proposed by the company's engineering team were compared against other biological wastewater treatment processes, including conventional methods. After piloting the comparative technologies and completing a five-month pilot program testing the effectiveness of ActiveCell biofilm

Wastewater pollution control facility achieves success with MBBR installation

Table 1. The MBBR process provides high nitrification even during cold winters.



media, the ActiveCell MBBR process was selected as the most efficient, cost-effective upgrade solution for this large municipal wastewater treatment plant (see Table 1).

WPCF in Action

The full-scale WPCF was engineered and designed by CDM and retrofitted an existing aerated pond. The ActiveCell media portion of the plant was commissioned in March 2003. The biofilm carriers are used for a separate-stage MBBR nitrification system designed to nitrify ammonia. They meet seasonal compliance standards of less than 4 mg/L NH₃ for effluent discharge to the Red River. The ActiveCell separate-stage nitrification process at Moorhead WPCF has been featured in a number of Water Environment Federation Technical Exhibit and Conference technical papers over the past five years.

The separate-stage MBBR nitrification process uses free-floating biofilm carriers that provide 450 sq meters/cu meters of active surface area (402 sq meters/cu meters internally protected). It has provided many advantages to the WPCF, including the ability to operate on a single pass without the need for a postclarification process typically required in conventional treatment systems to provide and maintain a mixed liquor suspended solids concentration for activated sludge processes.

Positive Results

The self-regulating biofilm process is self-sloughing and requires minimal operator attention. The ActiveCell process is capable of providing high-rate nitrification even during exceptionally



The ActiveCell MBBR process was selected after a five-month pilot program; it has the ability to operate on a single pass without the need for postclarification. The system provides high-rate nitrification and requires minimal operator attention.



cold water conditions at the Moorhead location and meets the stringent seasonal discharge parameters during the early days of spring. The ActiveCell process is expandable by adding additional biofilm carriers and increasing the air supply to the diffuser system.

“Since commencing operation, our MBBR has proven to require very minimal operator attention, effectively nitrifies even during the cold winters in

Moorhead and adapts well to fluctuations in loading,” said Andy Bradshaw, utilities engineer, city of Moorhead. **MT**

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