



PRICE AND COMPANY, INC.

# CASE FILES

Geopro® Learning Tool

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Water leaving grit pond, in-route to return water pond

## Morse Lake Gravel Extraction

Caledonia, MI Summer 2001 - Ongoing

**Problem:** Water used for tertiary washing during gravel mining operations contained sufficient suspended solids that, occasionally, the resulting processed gravels did not meet maximum P200 gradation limitations.

*Morse Lake Sand & Gravel* [Grand Rapids, MI] contacted *Price and Company, Inc.* to determine if polymers could be used to assist in clarifying the return water of their closed-loop system.

Simple field sampling and bench testing were undertaken in conjunction with Price and Company, Inc. to determine if polymer usage would be of

value. The test indicated that *Applied Polymer Systems, Inc.* [APS] **702b Floc**

When properly matched to site soil lithologies and water chemistries, one or more polyacrylamides [PAM's] will cause rapid, relatively complete flocculation and/or chelation of suspended solids within a water column. Once formed, the floc will drop, via gravity, in a quiescent water body, allowing passage of relatively clean surface waters.

**Log**® [partially hydrated form of the polymer] developed large floc within 20 seconds of being added to and mixed with the turbid site water. The resulting water achieved upwards of 98% clarity through this process.

**Solution:** *Morse Lake Sand & Gravel* placed **APS 702b Floc Logs**® at the effluent of the grit pond discharge pipe. Water passing by the **Floc Log**® slowly dissolved the anionic PAM. Continued movement toward the return water pond allowed mixing of the turbid water with the polymer, thereby enabling the desired floc to form. Floc developed in the channel dropped quickly to the return water pond bottom, allowing clean water to be pumped into the washing

operations. Each **Floc Log**® includes an embedded hemp rope with a length and securing loop extended from the block. This feature allows placement, security and replacement of the product simple. Flow quantity, determined by pump RPM setting and

pump curve calibration, dictated the number of **Floc Logs**® used.



Grit pond effluent with attached **Floc Logs**®

Because *Morse Lake Sand & Gravel* applied this use of **Floc Logs**<sup>®</sup> as a 'trial', special provisions were not taken to prevent system discharges from causing erosion along the channel from the grit pond to the return water pond or slope runoff from transporting soils into the channel [such erosion could produce untreatable, suspended solids within the water entering the return water pond]. In essence, the entire process included placement of the **Floc Logs**<sup>®</sup> within the existing system, as shown below.

**Results:** *Morse Lake Sand & Gravel* achieved the desired clean water in the return water pond using this

Pipe outfall from grit pond – **Floc Log**<sup>®</sup> location



simple **Floc Log**<sup>®</sup> system. Water clarity was significantly improved, allowing continued specification attainment. Continued desire to use the **Floc Log**<sup>®</sup> solution resulted.

**System Advantages Include:**

1. Passive system requires no pumps or labor [other than to replace **Floc Logs**<sup>®</sup> when required],
2. Inexpensive – approximate cost of \$0.00007 per gallon, and
3. Reliable – continues to work without operation management.

For more information on how **APS** polymers may be used to clarify process water, storm water and construction site discharge water, contact your **Price and Company, Inc.** Sales Representative.



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