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Project Profile

TRIECA 2017

*Removal of Suspended Sediments during a
Pond Dewatering using PAM Treatment
Train: a Case Study Approach*

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March 2017*





Project Profile

Outline:

1. Project Background
2. How Polymer Works
3. Selection of Polymer
4. Treatment Method and Setup
5. Results





Project Background

Project Profile

Install Date	July, 2016
Location	Highway 407 Extension Courtice Ontario
Scope of Work	▪ Supply and install sediment removal process using Clearflow Polymer ▪ Objective was to remove suspended solids from pond water before discharging to local receiving watercourse
Challenge	▪ 26 million litres of water pumped using a single 150mm (6") pump ▪ Meet local regulatory guidelines ▪ The process needed to run with little to no intervention.

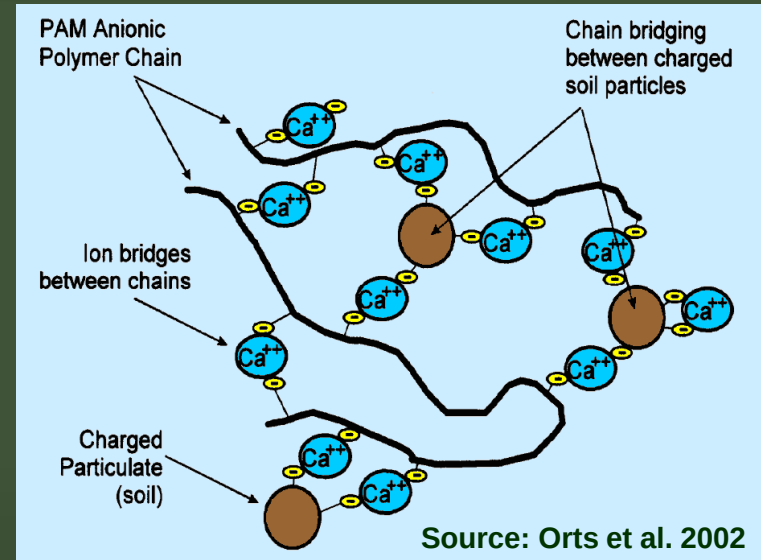




How Polymer Works

Project Profile

- Water Lynx™ polymer blocks and Treated Geo-Jute™ contain anionic polyacrylamide (PAM)
- PAM is safe, easy to use, and very effective at solids removal, achieving rates up to 95%
- Called anionic because it has a net negative charge, allows it to bind with positively charged soil particles
- Other contaminants bound to the soil particles are also removed from suspension





Selection of Polymer

Project Profile

Jar Test Procedure

1. A sample, representative of the water/ suspended sediment within the pond is collected.
2. Approximately 100mL of sample is poured into a jar and a piece of water lynx block is added to the jar, with several samples jars and several different polymers tested within each jar.
3. Each jar is observed to determine the polymer which best flocculates the suspended solids
4. An NTU meter is used to confirm the before and after clarity of the each sample jar. The polymer which provides the best results is selected.



Untreated - 80.8 NTU



Treated - 4.18 NTU



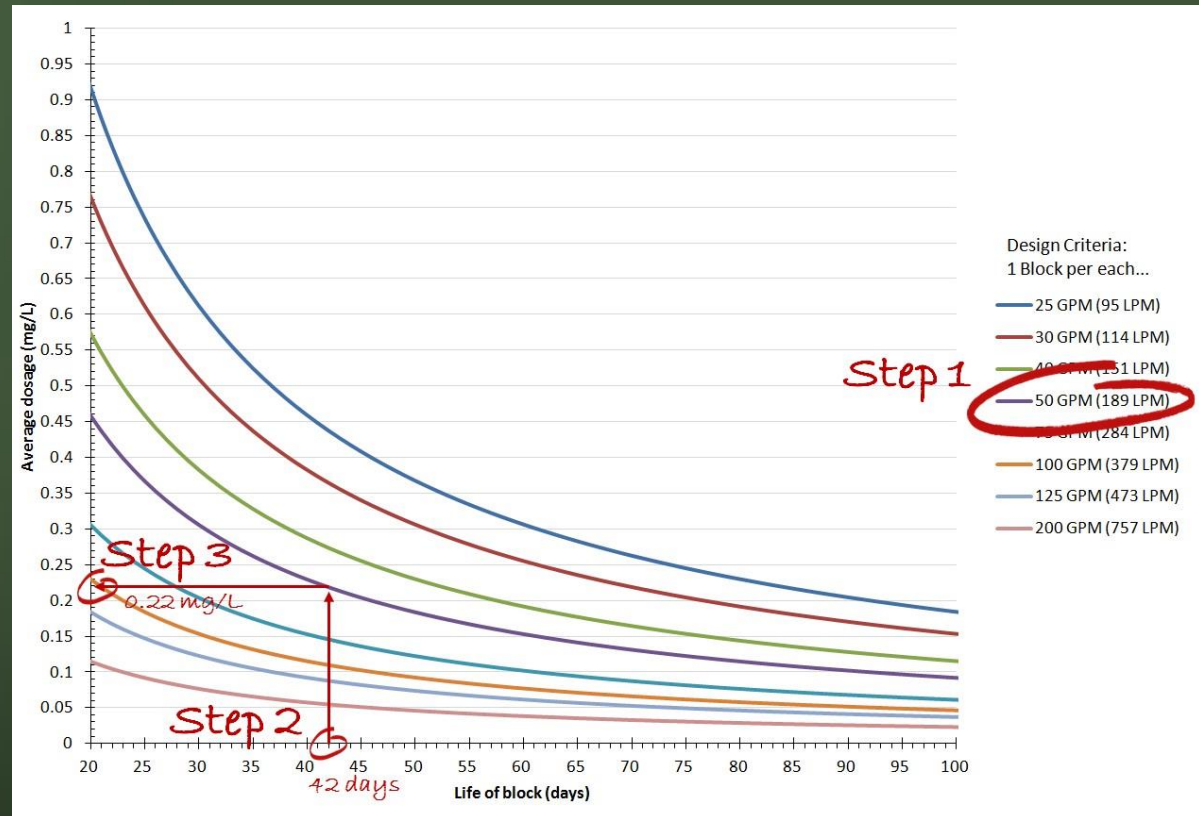


Water Lynx release rates

Example:

Water Lynx polymer blocks used in a ditch flowing at 500 US gallons per minute.

- Typical design is 50 gpm/block
- Requires 10 Water Lynx blocks.
- Conservative estimate is to assume the blocks will be completely used up in 6 weeks.
- Go to curve on chart to determine average dosage of 0.22mg/L

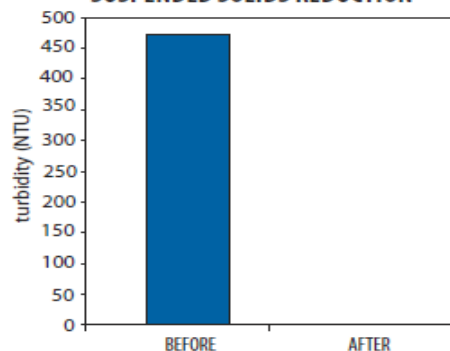




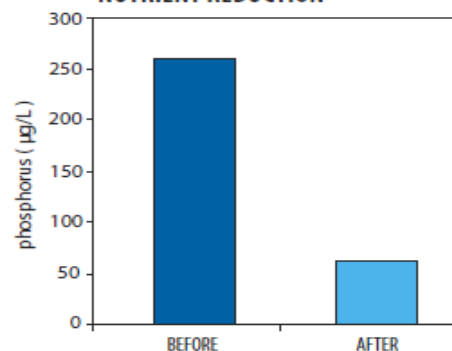
Example of Water Lynx Product Results

Project Profile

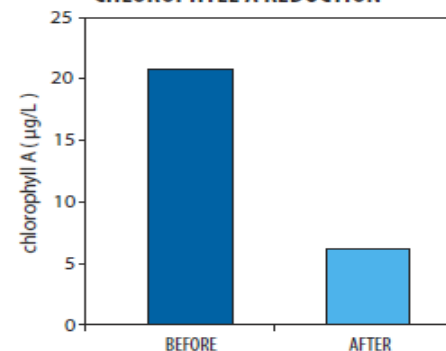
SUSPENDED SOLIDS REDUCTION



NUTRIENT REDUCTION

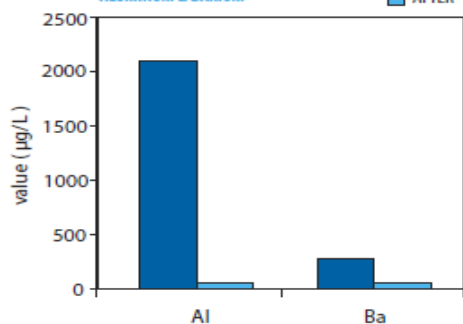


CHLOROPHYLL A REDUCTION



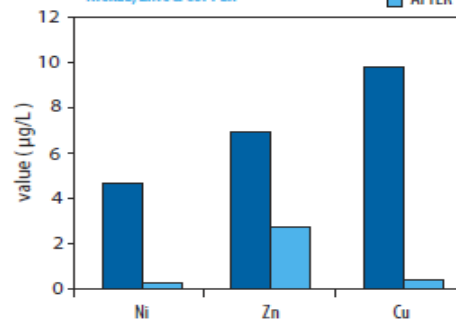
METAL REDUCTION

ALUMINUM & BARIUM



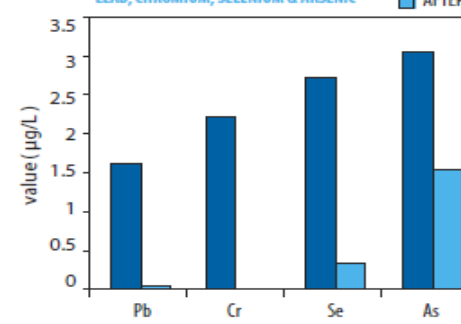
METAL REDUCTION

NICKEL, ZINC & COPPER



METAL REDUCTION

LEAD, CHROMIUM, SELENIUM & ARSENIC





Pond Site

Project Profile





Treatment Method and Setup

Project Profile

Components included:

- Clearflow Pipe Reactor “Bazooka”™
- Water Lynx™ polymer blocks
- Treated Geo-jute™ materials
- Ten- Cate Geotubes®
- Pumps and hoses to carry flow
- Liner for clarifying ditch





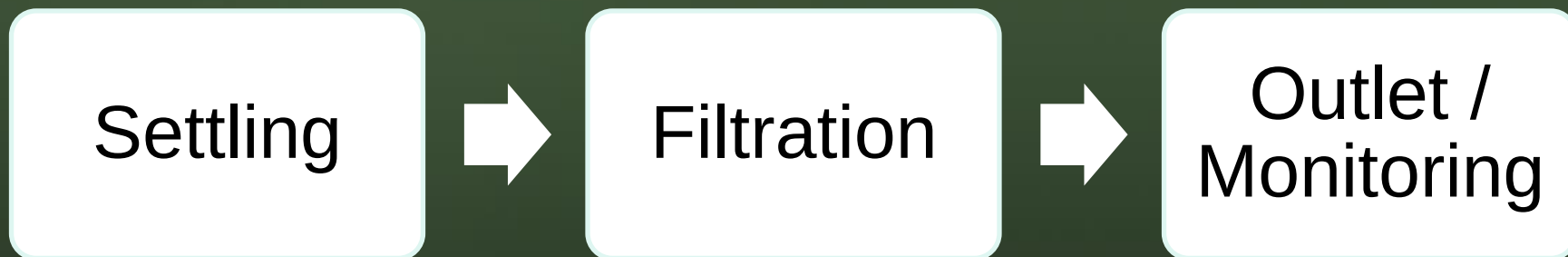
Its all in the process!

Project Profile

Zone A: Optimal Flow Velocity 1m/sec

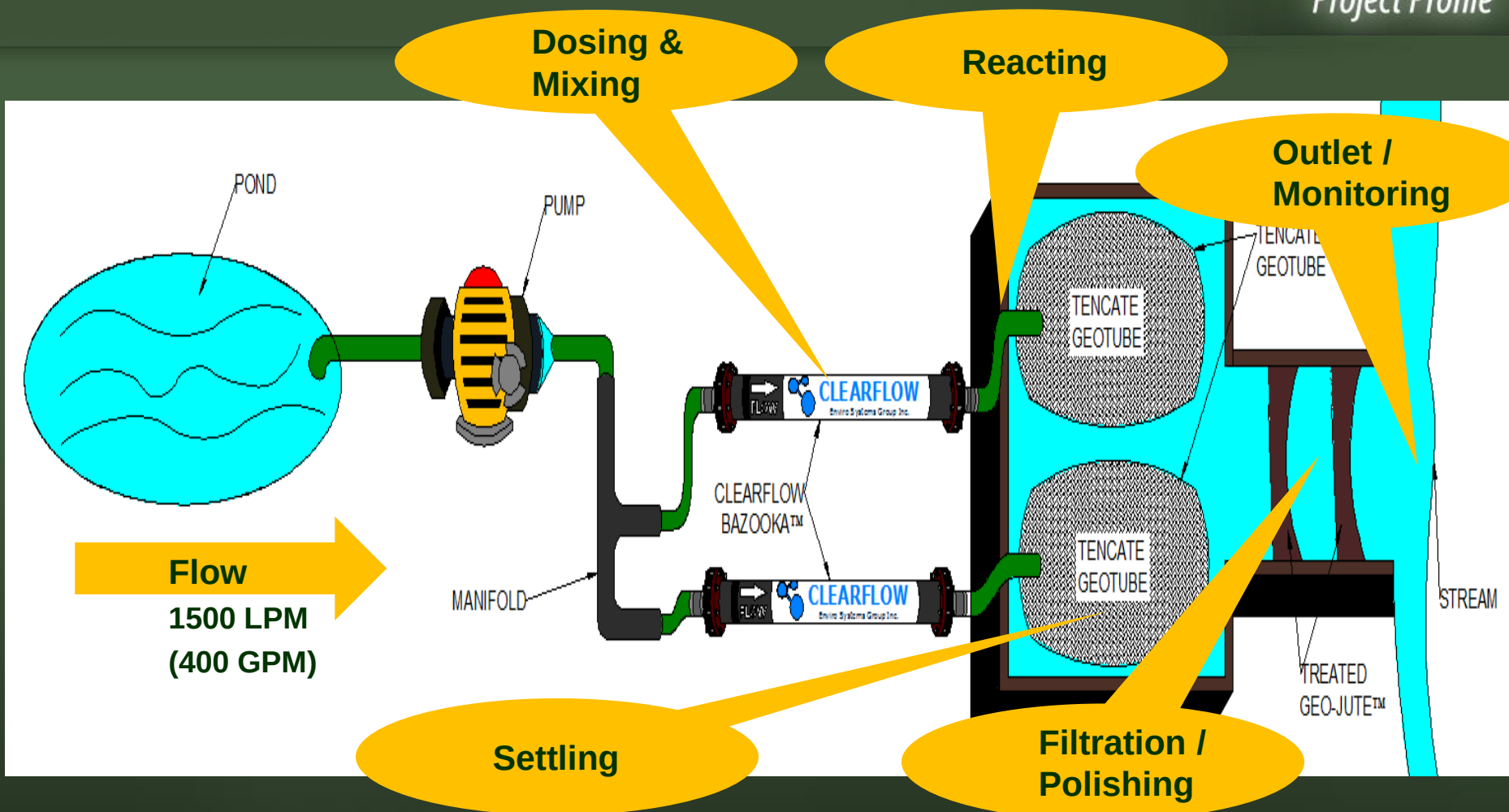


Zone B: Optimal Flow Velocity 0.15m/sec





Project Profile





Dosing & Mixing Stage using Bazooka

Project Profile





Project Profile





Settling and Filtration

Project Profile





Outlet and Monitoring

Project Profile







Summary

Project Profile

- Economically and environmentally beneficial, as the products can be reused in future dewatering projects
- Significantly decreased the amount of TSS through 3 water treatment techniques from over 700 NTU to an acceptable level of less than 15 NTU
- Ability to accommodate different sized pumps to allow for minimal dewatering time
- The pump functioned automatically and worked well with the designed system, which resulted in minimal supervision

