

# Pilot Case History: Cement Dust Filtration from Water



## Background

In 2003, an aggregate products manufacturer contacted Purifics to purify and control the water used during the manufacturing process. At this site, stone cutting operations utilized up to 100m<sup>3</sup>/day of water for tool cooling and dust suppression, and spent water contained high concentrations of aggregate fines, dust, and other workplace debris which was drained into the lay down yard. This created a wet, untidy work environment and runoff (discharge) issues. The water discharge had the attention of the Environmental Regulatory Authority who was mandating corrective action. The client then began the process of engineering an expensive settling pond until Purifics offered a cost effective alternative solution.

## Challenge

The client required a simple, variable flow water reuse system that would reduce water consumption as well as reclaim water and sub-micron fines. For reuse, the water had to be free of any particulate and color that could wear or jam the nozzles on the cutting equipment, or color or foul the architectural stone. Purifics proposed a novel CUF system that would fit the existing plant operations while allowing the client to cut costs and reduce waste.

TREATMENT REQUIREMENTS	Influent	Effluent
Nominal Flow Rate	100m <sup>3</sup> /shift	On demand
Peak Flow Rate	1m <sup>3</sup> /min	On demand
Solids	Debris and micron size	< 1 micron size
Colour	Variable	No Colour



Cutting machinery utilized water for coolant and dust suppressant



Beveling Line with Collection Trench and Water Distribution Line

## Solution

Purifics installed a fully automated and remotely supported CUF system. In this application, a fixed volume of water (10m<sup>3</sup>) is used in a closed-loop process where it is continuously used, cleaned, and recycled directly into the 60psi water distribution manifold by the CUF system. The system was sized for the steady state load of 400l/m (100gpm), but customized with a built-in surge capacity of 1m<sup>3</sup>/min (250gpm).



## Benefits

The client experienced many benefits from the CUF installation. CUF is not vulnerable to abrasion or separation failure and it provides pressurized redistribution of water for optimal reuse. Not only was CUF customized to suit the client's needs, it was also designed to be compatible with the existing machinery components at the facility. Ultimately, the chemical-free, waste-free CUF increased plant efficiency and safety, while providing a clean, environmentally friendly facility. CUF has a 20 year product lifespan, so our client can enjoy the benefits it brings for years to come.

## Results

Once installed, the client benefited from the low lifecycle cost of the CUF system. CUF also lowered the client's total consumption, disposal, and labour costs by \$72/day. The efficiency of the CUF system **eliminated**:

- Retention ponds
- Regulatory approval
- Third party environmental sampling
- Quarterly compliance reports to regulatory authorities

In 2006, as the business grew and production increased, the client built a new plant based on the CUF system for water reuse.



Finished product

**Cuf** is a unique water purification system designed to separate silt or particulate from water to facilitate **complete product recovery** and **water reuse with no backwash**. The closed-loop process is ideal for manufacturing, construction, mining, petrochemical, and agricultural processes, where large quantities of water are used regularly. By providing a quick and easy method for product recovery and water reuse, CUF helps companies reduce costs and achieve competitive advantage. Applications include:

- TSS removal in drinking water
- Silt removal or slurry recovery
- Fines recovery from cutting and grinding processes
- Wash water filtering and reclamation
- VSS & TSS removal in waste water
- Oil removal & Tailings water recovery in the oil sands



Samples



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