BISHOPWATER

Case study:

Potato processor treats and reuses wash water with simple, affordable dewatering system

- Agricultural wash water: solids capture and water reuse
- Bishop Solids Management Solution
- Ontario, Canada

The challenge:

Finding a better way to remove TSS from wash water

Washing annual harvests of commercially grown root vegetables or tubers can produce a challenging waste stream that is laden with high concentrations of soil particles, plant debris and nutrients such as nitrogen and phosphorus.

An Ontario-based grower was producing up to 25,000 L/day (6,600 gallons) of this kind of wash water and discharging it to an onsite storage pond, which enabled the solids to settle and the water to infiltrate into the soil.

But even after passing through a series of settling tanks, the solids concentration in the water reaching the pond was still quite high—up to 1.4%.
This caused the pond to fill quickly with solids and diminished its storage capacity, increased the risk of overflow and the possibility of releasing high-TSS, nutrient-rich water into the environment.

The grower needed a simple, affordable way to achieve better solids removal from the wash water and eliminate the risk of overflow from the pond. Ideally, the process would also produce high quality water that could be reused in the washing process.

The solution:

Geotextile container with polymer treatment captures solids and filters water

In 2016 Bishop Water installed its Solids Management Solution, an easy-to-operate, low-energy system that uses Geotube® geotextile containers, specially selected polymers and gravity to collect and consolidate solids in the wash water, while releasing low-TSS filtrate.

The system is installed inside the process building, which enables it to operate year round. The process continues to use the settling tanks, but instead of sending the supernatant to the storage pond it is transferred to two 5,700 L (1,500 gal) mixing tanks.

Water samples from the Bishop Solids Management Solution show raw wash water (left), one minute after the addition of coagulant (centre) and treated filtrate from the Geotube® container (right.)

The Bishop Solids Management Solution removes up to 99% of the TSS from the wash water and releases clear filtrate that can be reused in the washing process.

Once the container is full, the consolidated solids can be reapplied to fields for continued agricultural use.

Once the tanks are full, a batch dewatering process begins. The contents are mixed then the homogeneous slurry is pumped to the Geotube dewatering container, which is set up on a sloped, concrete dewatering pad and surrounded by a low berm.

As the wash water is pumped, Bishop Water's compact, low-maintenance, VEPAS™ (Venturi Emulsion Polymer Activation System) adds polymer directly to the sludge line to coagulate the solids and accelerate the dewatering process.

A single Geotube container, 13.7 m (45 ft) in circumference and 17.3 m (57 ft) in length, provides sufficient storage and dewatering capacity to handle about 2.5 million litres (660,000 gal) of wash water, or about a year of operation.

The results:

99% TSS removal produces reuse-quality filtrate

Geotubes are made from a woven polyethylene yarn, which not only provides strong, reliable containment, it also enables filtration through the microscopic openings in the engineered textile. Combined with the optimal polymer selection and dose, the Bishop Solids Management system retains as much as 99% of the TSS and releases clear filtrate. Since commissioning the system, the grower can handle all aspects of soil separation from wash water indoors and no longer requires the use of the storage pond.

This clear filtrate is collected in the laydown area and pumped to an 11,350 L (3,000 gal) tank, where it is stored until it is reused for washing produce. This sustainable new source of wash water has enabled the grower to significantly reduce its demand on the local potable water supply.

The soil that is captured in the Geotube container dewaters to a solids concentration of 15 to 20% within a few hours and continues to dewater for as long as it remains in the bag.

Once the bag is full, the grower can open the container and reapply the soil to fields for continued agricultural use.

The VEPAS eliminates the need for mixers and aging tanks so operators can clean the system in just a few minutes and quickly have it ready for the next batch run.

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