

ECOMISTER

EVAPORATOR



Solid Waste Industry Solutions
Next Generation Leachate Disposal Technology



ecomister.ca

Slimline
MANUFACTURING
Engineered for the Future

LEVERAGING NATURE TO PRESERVE NATURE

The EcoMister Evaporator

Twenty five years ago, the wind and water engineering team at Slimline Manufacturing Ltd. developed the EcoMister Evaporator 1.0, the first highly effective portable Evaporator technology for the global mining industry. Since then, we have installed over 600 EcoMister Evaporator Units on sites around the globe.

The initial prototypes were developed and tested at Mascot Mine (currently owned by Barrick Gold) in 1996, in Hedley BC, Canada. The goal of the project was to harness and dramatically accelerate the natural process of evaporation, while sequestering any and all contaminants from the pond, allowing the site to undergo bioremediation, and return to its natural state.

BEFORE:



THE PROOF IS IN THE POND

The Mascot Mine in Hedley BC, in 1999. Slimline Engineers developed and tested the original prototypes between 1999 and 2003.

The original site of the tailings pond at Mascot Mine is now returned to near original condition.

AFTER:



THE SCIENCE BEHIND THE RESULTS

The EcoMister Evaporator

In designing the original EcoMister Evaporator (then called Turbo-Mister), the engineers at Slimline Manufacturing Ltd. accepted the following evidence, proven in separate studies at Virginia Tech and OhioState University, as truths:

The smaller the water particle, the faster it will evaporate, but with a proportionate increase in the potential for “drift”. “Spray droplet size is by far the most important factor affecting drift. Spray droplet diameters are measured in micrometers. A Micrometer is 1/25,000 of an inch, and is usually referred to as a micron. For reference, the thickness of a human hair or a sheet of paper is roughly 75 microns.”



To achieve maximized evaporation while minimizing the potential for drift, the EcoMister exposes the maximum volume of water particles to air.

POWER CONSUMPTION ANALYSIS/HD30 SINGLE PACK

Calculated based on a \$0.06 US dollar per kWh

EVAPORIZATION AND PUMP EFFICIENCY FOR 7 MONTHS {210 DAYS} *

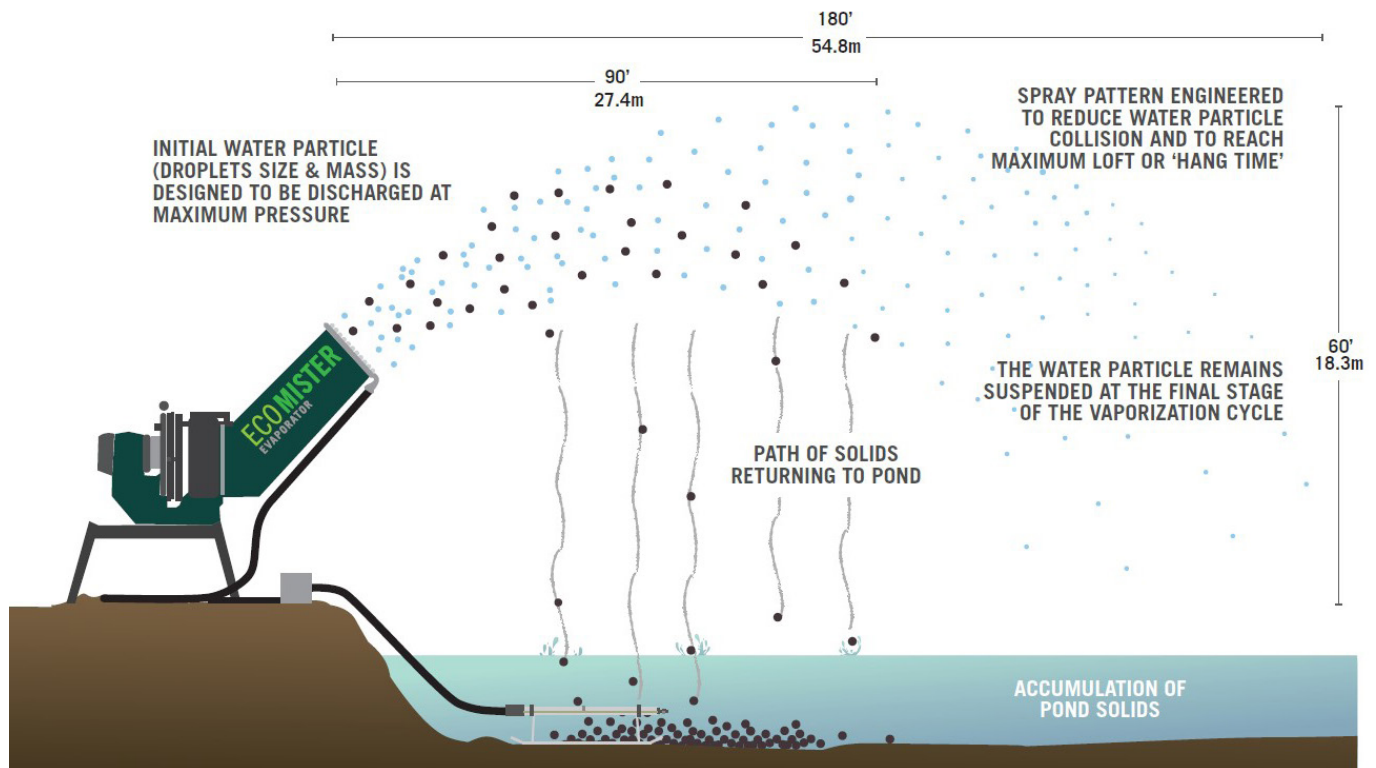
- Total Gallons Evaporated Over 210 Days= 10,019,934 US Gallons
- 5,112 total hours
- \$9,790.50 Total cost per 7 month evaporation season
- \$0.001 cost per US gallon

* Using the pan evaporation data from: <http://www.wrcc.dri.edu/htmlfiles/westevap.final.html>, a US government site, we have calculated the performance of the HD30 from the Beowawe U of N Ranch in Nevada.

PRECISION ENGINEERING. PREDICTABLE RESULTS.

The EcoMister Evaporator at Work

Harnessing the natural process of evaporation is the future of wastewater disposal. The EcoMister Evaporator series from Slimline Manufacturing uses our patented Turbine technology to loft wastewater into the air, creating optimal 'hang time', and allowing nature to evaporate the water, while the solids are returned to the pond.



The EcoMister Evaporator generates 160 km/hour (100 MPH) air velocity through the wind tunnel, the nozzles propel the liquid exposing the maximum volume of water particles to the air creating optimal hang time, outperforming the competitors.

Key Differentiators

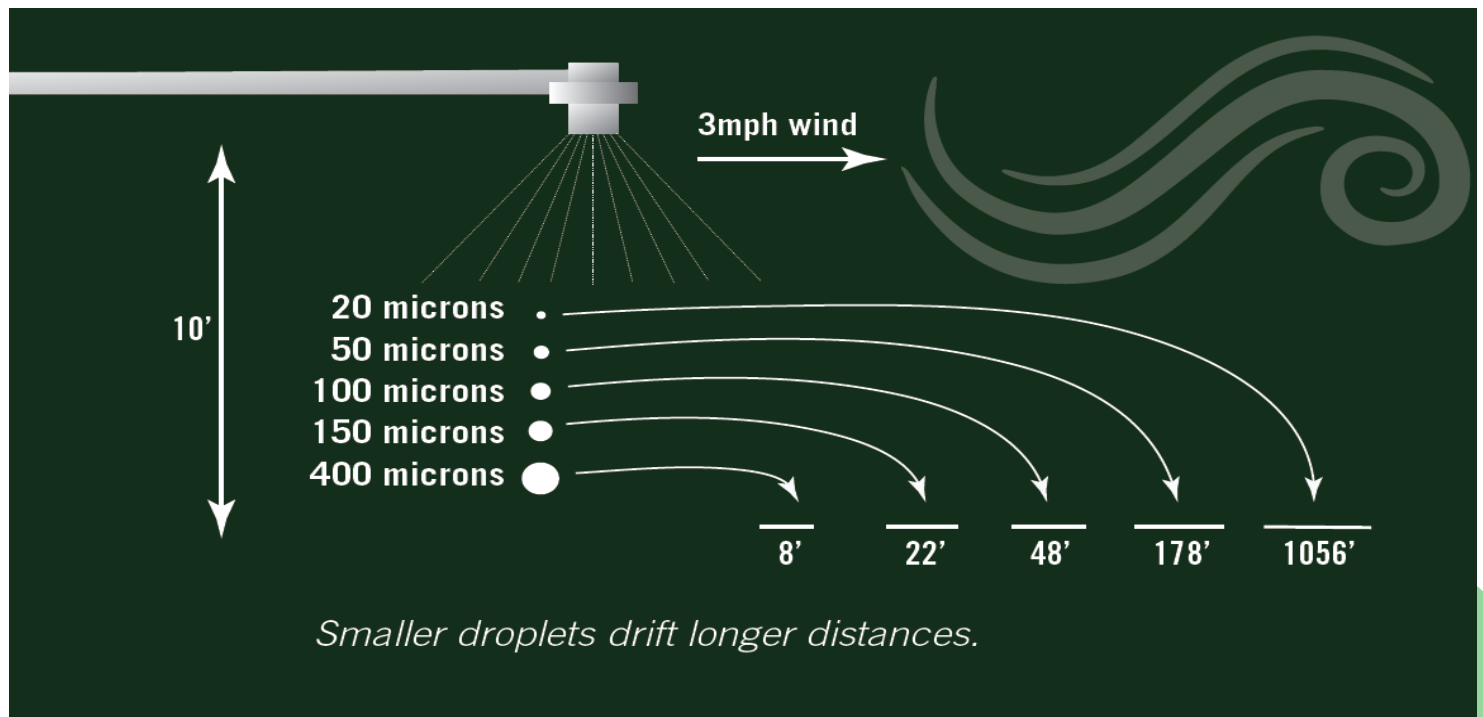
- Longevity in the Harshest Environments
- Best in Class Evaporation
- Low Operating Costs
- Flexibility

PRECISION ENGINEERING. PREDICTABLE RESULTS.

The EcoMister Evaporator at Work

Research has shown that there is a rapid decrease in the drift potential of water droplets greater than 150-200 Microns. Droplet size where drift potential becomes insignificant depends on wind speeds, but lies in the range of 150 - 200 Microns for wind speeds of 1-9 MPH (Bode, 1984).

Based upon findings by Virginia Tech, a water droplet size of 150 microns will fall at 1.7 ft/sec, and take 16 seconds to evaporate, requiring the droplets to fall 27.2 feet to ensure evaporation. A water droplet of 100 microns will fall 0.91 ft/sec, and take 7 seconds to evaporate, which is a drop of only 6.37 feet- opening the door for drift.



LANDFILL CASE STUDY

Project Profile Slimline Manufacturing Ltd.

EVERYTHING THAT COMES HERE, STAYS HERE

How a landfill managed by a not-for profit association exemplifies progressive fiscal, environmental, and community values.



Emile Saindon oversees a staff of 11, three stormwater ponds, and two leachate ponds, and manages the Municipal Solid Waste for two towns in southern Alberta. Pincher Creek sits in a mining, oil, and gas community in western Canada, a region hit hard by low oil price and the myriad challenges including a new pipeline to get its product to market.

Originally built in 1976, by the mid-1990s the site became a Class 2 Registered Landfill and began accepting industrial waste. Today, the Crowsnest/ Pincher Creek Landfill site manages over 100,000 metric tons of commercial and municipal waste in a typical year. Commercial contractors come from as far away as Vancouver, British Columbia, some 600 miles to the west, and from all points in between.

“We have the lowest tipping fees in Alberta” admits Emile, which is a reflection of the best in class technology, innovation, and cost containment that has been implemented to achieve the operating goals of the site.

“All of our equipment is GPS tracked by our suppliers; we don’t have downtime, we have advance notice of servicing, and we plan for every contingency;” says Emile. Operating 10 hours a day, 6 days a week, 52 weeks a year in a rugged northern climate requires some advanced planning, but it also demands innovation. “As a member of SWANA Northern Lights Chapter, and as a member of Alberta Recycling Management Authority, we have extremely high standards we are measured against. Our staff and engi-

neering partners are always looking for ways to work smarter, reduce our footprint and generate operational savings; we receive no funding from any level of Government, so working smart isn’t an option, it’s the only option.” “We’re saving \$200,000 to 250,000 a year, from a one time investment of \$75,000 all in. Our 5 year net return will be roughly \$1 million in savings:”

One of Emile’s cost-saving plans came into effect in 2016, in the form of a customized EcoMister Evaporator. (formerly known as the Turbo-Mister), from Slimline Manufacturing Ltd. an OEM company known for engineering custom wastewater management solutions.

LANDFILL CASE STUDY

Project Profile Slimline Manufacturing Ltd.

With two 55-by-55-meter (150-foot-by-150-foot) leachate ponds naturally running high in spring, the site would truck excess liquid from the ponds starting in early March to a deep-well site to be treated and disposed of, the volume of which was dependent on the severity of the winter snows and the amount of rainfall. Disposal costs averaged out at \$200,000 in low year and up to \$250,000 or more in heavier years.

Emile recalls the decision point as a small but meaningful “eureka” moment: “One of our consulting engineers suggested the evaporator as a solution, allowing us to dramatically enhance natural evaporation, and bring the pond level down by three to six inches a week.

We knew we’d need a custom application, and as our ponds are remote, we’d need a self-contained power source. The SlimLine Manufacturing Ltd.’s team created a model that met all of our criteria. For the past 2.5 years, we’ve run the evaporator 10 hours a day, six days a week, for six months each year, powered by a small diesel generator. Our maintenance costs have totaled about \$2,000, and we haven’t had to truck off a single drop out of the ponds since.”

With the small diesel generator we run the evaporator for pennies an hour, every day, all through the season?

With some highly corrosive materials contained in the ponds, Emile expected some breakdowns, even if modest in scale, but none materialized. “We haven’t even changed a nozzle”, said Emile, “after constant use over two and half years. We spent \$2,000 rebuilding the pump after the first year, because we didn’t want to take any shortcuts, but that’s about it. With the small diesel generator, we run the evaporator for pennies an hour, every day, all through the season. We’re looking at getting a second evaporator now.”

In an era where industry is being challenged to demonstrate a newfound commitment to environmental protection, and with cost minimization always the overwhelming priority, Emile and his team found a way to meet the challenge head on, saving fuel, saving money, and reducing their footprint. No wonder they have the best tipping fees in Alberta.

MSW



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Next Generation Leachate Disposal Technology

SAVE YOUR MONEY
PROTECT THE ENVIRONMENT
HARNESS THE COMBINED POWER
OF TECHNOLOGY & NATURE



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