

CASE STUDY

Wastewater Treatment Removal of microplastics in wastewater



Client: NSW
Government



Removal of
microplastics
from commercial
laundry
wastewater

Infinite Water has developed a scalable and efficient solution for the removal of plastic microfibrils in wastewater, preventing them from being released into the environment.

The Challenge

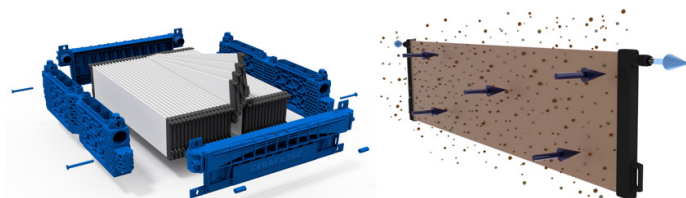
A significant amount of microplastics are released into the environment from laundries everyday. The NSW Government was looking for new and innovative ways to remove microplastics from the effluent released by commercial laundries. It was critical that the solution:

- 1) Improved the overall quality of the treated effluent to maximise re-use
- 2) Minimised volume of waste discharged to the environment
- 3) Could treat high temperature laundry wastewater for re-use to avoid heat loss and reduce energy consumption.

Our Solution

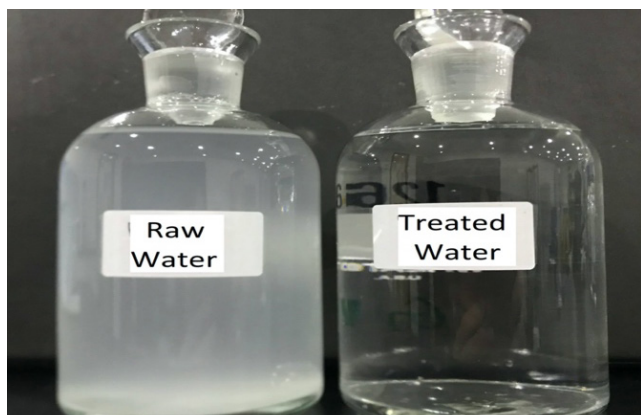
Infinite Water developed a compact, modular and scalable solution incorporating the next generation flat sheet submerged ceramic membrane technology. The alumina (Al_2O_3) membrane filters have a pore size of $0.1\ \mu m$ and reject all particles that are a larger than $0.1\ \mu m$. Smaller particles can be agglomerated through coagulation which makes pin flocs large enough to be rejected by the membrane.

The membrane modules can be stacked on top of each other and in parallel trains to build capacity.

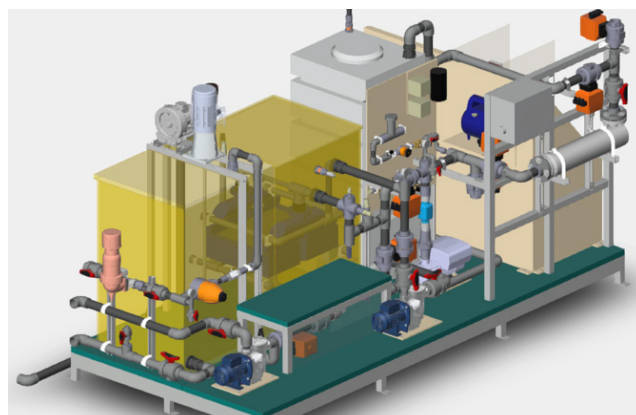


Wastewater Treatment

Removal of microplastics in wastewater



Raw water and treated water



3D image of the microplastics treatment plant

System Performance

The process achieved:

- ▶ greater than **99.3% removal** of all microplastics
- ▶ High quality of recycled water with reduced turbidity and neutralised pH
- ▶ **Up to 90%** reduction in potable water use

The system also improved other physical properties and chemical characteristics of the wastewater by reducing:

- ▶ Phosphorous
- ▶ Suspended Solids
- ▶ Organic content
- ▶ Pathogens

Incoming wastewater was treated at high temperatures (typically 30-40 deg C) without cooling, resulting in energy savings for laundry facilities.

Additional Treatment

If required, the treatment process can easily be fitted with suitable downstream **polishing** stages to further improve treated water quality or target selected contaminants of concern.

Operational costs (OPEX)

Operational costs for treating laundry effluent are circa \$1 per m³. Therefore, expenditure on water is significantly reduced as more water is recycled.

Return on investment (ROI) is circa 2 years.

Applications

The treatment technology can be applied to wastewater produced by any sector or industry that directly or indirectly releases microplastics into the environment. These include:

- ▶ Commercial laundry services
- ▶ Municipal wastewater tertiary treatment
- ▶ Primary and secondary producers of microplastics such as manufacturers of:
 - » Pharmaceuticals
 - » Textiles
 - » Electronics
 - » Consumer goods
 - » Food packaging