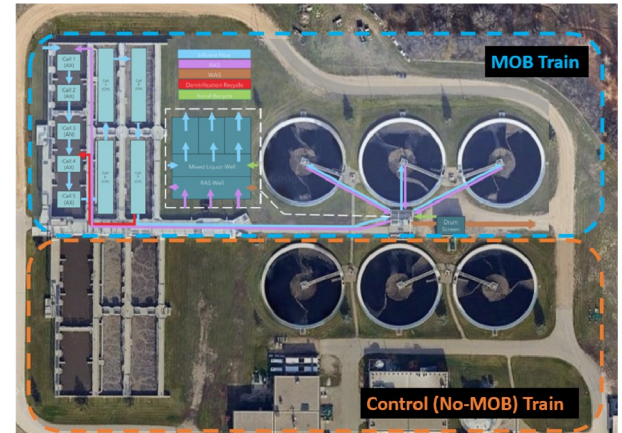


THE CHALLENGE:

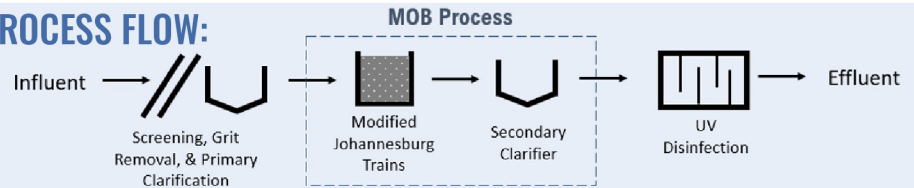
Saskatoon WWTP, located in Saskatchewan, Canada, has historically been limited to seasonal nitrification, achieving ammonia removal in the warmer months but struggling to sustain it through winter. The obvious fix of increasing solids residence time (SRT) to keep the slow-growing nitrifying population alive at cold temperatures is easier said than done. The longer SRTs needed for winter nitrification would have increased solids loading to the secondary clarifiers. This concern is compounded by the fact that cold temperatures independently drive poor settleability and sludge bulking at the Saskatoon WWTP, making clarifier performance the least reliable, precisely when the highest SRT burden is placed on it. With a year-round ammonia permit on the horizon, the facility needed an intensification solution that could deliver winter nitrification, while also resolving the settleability limitations that had made nitrifying SRTs unattainable.



FACILITY OVERVIEW:

Facility Flows	94 MLD (25 MGD) Average Flow 190 MLD High Flow Event Simulated
Effluent Goals	- Improve settleability for capacity and increase wet weather resilience - Maintain treatment - TSS < 25 mg/L - TP < 0.75 mg/L
Project Goals	- Achieve cold weather nitrification and ammonia less than 3.0 mg/L - Manage higher solids inventory and maintain clarification performance - Improve clarifier flow throughput - Stabilize winter SVI - Validate peak flow throughput

PROCESS FLOW:



WHY THE MOB PROCESS WAS CHOSEN:

The MOB Process was selected in part for the well-established settling benefits of the BioKARRIER media. When first added to an activated sludge system, the ballasted settling characteristics of the media immediately improve settleability and stabilize SVI within 24–48 hours. As the biofilms begin to mature, the mobile carriers become enmeshed in the suspended solids, and the settling velocity of the entire sludge blanket increases substantially, directly relieving clarifier stress. To isolate and quantify these benefits, the BioKARRIER media was installed in only one train, leaving the second as an unmodified control for direct comparison.

The Saskatoon demonstration delivered compelling evidence of this effect. Following media installation in March 2024, the MOB Train SVI dropped rapidly and stabilized below 80 mL/g. This was a reduction of more than 50% compared to pre-demonstration winter averages. The MOB Train SVI remained consistently low through seasonal variability, while the control train saw winter SVI climb back above 180 mL/g. Peak flow testing further validated the clarifier resilience of the MOB Train. With solids loading rates exceeding the design of 180 kg/m²/day, the effluent TSS in the MOB train remained below 10 mg/L even with one clarifier temporarily removed from service. The data collectively demonstrated that improved settleability is not incidental to the MOB Process; it is a core and reliable outcome.

WHAT WAS ACHIEVED:

	Stabilized poor winter settleability and increased clarifier capacity
	Reduced average SVI by 22% year-round and 30-50% in winter months
	Prevention of solids washout during simulated peak high-flow event
	Managed solids loading to the clarifiers while achieving cold weather nitrification
	Retrofit installation without facility downtime

WHAT THE MOB PROCESS CAN DO FOR YOU:

- Increased Clarifier Capacity
- High Loading Process Stability
- Full-Scale Demonstrations and Retrofits
- Stabilized Settling Performance

