

WASTEWATER TREATMENT *MBBR & MBR TECHNOLOGY*

AN ENVIRONMENTALLY SOUND APPROACH TO WASTEWATER TREATMENT



Typical “in-ground”
MBBR facility.



Typical “outdoor uncovered”
MBBR facility.



Our wastewater treatment plants can effectively reduce pollutants to ensure the most stringent discharge limits are met.

THE MBBR AND MBR PROCESS

The Moving Bed Biofilm Reactor (MBBR) water treatment technology is an attached growth treatment process. MBBR wastewater package plants are efficient, effective, and economical turnkey wastewater treatment solutions.

MBBR technology is designed to enhance the activated sludge process by providing a greater biomass concentration in the aeration tanks, thus reducing the reaction basin size. This improves volumetric nitrification rates and accomplishes denitrification in the aeration tanks by having anoxic zones within the biofilm.

Sapphire Water’s MBBR technology achieves a high mineralization of organics, leaving little surplus sludge. As a result, fewer system cleanings are required.

When used with our ultrafiltration (UF) modules, a MBBR process becomes a Membrane Bio-Reactor (MBR), capable of meeting the most demanding of wastewater treatment goals.

KEY FEATURES

- Capacities range from 1 to 20,000 m³/day
- Suited to warm and cold climate conditions from +40°C to -55°C
- Designed and fabricated to suit the individual site requirements and specifications
- Packaged plants have a compact footprint, are self-contained, and easily transported
- Stainless steel construction
- Fully skid assembled
- Integrated sludge processing option
- Advanced automation options available



75 m³/day MBBR facility at the
Queen Charlotte Lodge, BC.

BENEFITS OF INSTALLING AN MBBR WASTEWATER TREATMENT SYSTEM

- Modular design makes scaling up or down very simple
- Plug and play features minimize installation time
- Fully automated MBBR systems are easy to operate and maintain
- Superior effluent quality makes disposal effortless
- Odourless and noiseless operation
- Low sludge production
- **Costs can be up to 40% less than those of comparable plants**
 - Reduced site work to install system
 - Low operating costs
 - Low power consumption
 - Reduced maintenance and cleaning requirements



The 1,200 m³/day wastewater treatment plant at the Harmony Beef Processing Plant uses seven different treatment stages to filter their wastewater.

It utilizes UF membranes and biological filtration to create a Membrane Bio-Reactor (MBR) system.

This incredible facility recycles 85% of its wastewater back into the meat processing system!

APPLICATIONS

MBBR and MBR technologies have many applications, such as wastewater treatment for small to medium sized communities, mobile work camps or military camps. In many jurisdictions, the high-quality effluent released from Sapphire Water's MBBR systems exceeds the quality standards required to be discharged into rivers, streams, and even lakes. Additional uses for effluent include:

- Irrigation
- Street cleaning and dust control
- Process water
- Water supply for cooling towers

SIGNIFICANT PROJECTS

**Harmony Beef Processing Plant, Alberta
2017**



System: MBBR / UF (MBR) Wastewater System (7 treatment stages: Mechanical, Primary, Secondary (MBBR), Tertiary, Effluent Polishing, Effluent Disinfection, Sludge Treatment)

Permeate Flow: 1,200 m³/day

Water Quality:

Parameter	Raw Sewage	Effluent
Sodium (mg/L)	131.6	10.2
Bicarbonate (mg/L)	190	23.5
Sulfate (mg/L)	150	1.6
Chlorine (mg/L)	150	4.5
TDS (mg/L)	766	52.8
BOD ₅ (mg/L)	600	< 5
TSS (mg/L)	100	< 5
Phosphorus (mg/l)	10	<0.02

**Hamlet of East Coulee
Alberta
2012**



System: In-Ground MBBR Wastewater System

Permeate Flow: 99 m³/day

Water Quality:

Parameter	Raw Sewage	Effluent
Suspended solids (mg/l)	300	≤ 10
BOD ₅ (mg/l)	230	≤ 5
N _{tot} (mg/l)	35	≤ 5 (winter) ≤ 10 (summer)
P _{tot} (mg/l)	10	≤ 0.5

**Oyen Co-Op Gas Station
Alberta
2011**



System: Underground MBBR Wastewater System

Permeate Flow: 18 m³/day

Water Quality:

Parameter	Raw Sewage	Effluent
Suspended solids (mg/l)	200	15
BOD ₅ (mg/l)	230	15
N _{tot} (mg/l)	64	30