High Capacity MBR Sewage Treatment System

This compact, easy-to-operate newterra Membrane Bioreactor (MBR) system combines activated sludge biological treatment with our advanced MicroClear™ ultrafiltration flat sheet membrane technology. The self-contained, high capacity system is comprised of four ISO-certified 40’ shipping containers (high cube) and requires an area of only 15 x 15 m (excluding equalization tank/lagoon and permeate storage).

This system, from our innovative BLOC MBR Series, is designed to treat 1,000 m³/day (or higher) of typical wastewater – the amount produced by a population of approximately 2500 to 6000 people (capacity will vary depending on the loading and flow rates of a specific application). The system features a fully automated PLC control system with touch-screen HMI to simplify operation and maintenance, as well as advanced telemetry for remote control, monitoring, and diagnostics.

Reuse Quality Permeate

High quality treated sewage effluent (TSE) is suitable for many reuse applications, including:
- Food crop irrigation
- Surface water reservoir augmentation
- Groundwater recharge of potable aquifer
- Landscape irrigation
- Toilet flushing

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Unlike conventional activated sludge systems that rely on gravity-based settlement of the mixed liquor, **newterra** membrane bioreactor (MBR) systems use ultrafiltration (UF) membranes as a physical barrier against the passage of all particulate solids. This allows MBRs to operate at four times the concentration level of mixed liquor suspended solids (MLSS) of conventional systems. As a result, MBR systems are very resilient to changes in influent quality, and require a much smaller system footprint — typically only 25% of that required by a conventional system.

**Inlet**
A submersible pump supplied with the system is placed in an existing wet well, equalization tank, wastewater storage tank or lagoon. The inlet pump is controlled by the PLC, and a fine screen protects the membranes from large solids in the inlet stream.

**Anoxic Zone**
The anoxic zone is kept mixed while maintaining a low level of dissolved oxygen. Denitrification occurs when specific microorganisms convert nitrates to nitrogen. Additionally, the anoxic stage recovers alkalinity, aids in stabilizing pH, and reduces aeration demand.

**Aerobic Zone**
Wastewater flows by gravity to the aerobic zone, where dissolved oxygen is controlled to an operator set-point to optimize the biological process. Fine bubble air diffusers keep the aeration tank mixed and maximize oxygen transfer to the mixed liquor. This allows biological oxidation of influent organics and ammonia. pH is monitored continuously and alkali can be added, as required, if it drops. Alum can also be added to precipitate phosphorus. The MLSS is then transferred to the membrane tank.

**Membrane Filtration**
Permeate is drawn through the membrane plates of the patented **newterra** MicroClear™ flat sheet UF membrane cassettes using a slight vacuum of 0.1 to 0.2 bar. Vacuum and flow rates are continuously monitored by a transmitter, providing instantaneous measurements of membrane flux and permeability. As indicated in the charts above, the treated sewage effluent (permeate) quality is excellent — suitable for direct discharge or reuse applications.

**System Performance**
**Wastewater Characteristics and Effluent Quality**
The system is designed to treat a broad range of wastewater, with hydraulic capacity varying with the strength of the sewage — from high-flow/low-strength to low-flow/high-strength wastewater.

Achievable permeate/effluent quality is shown in the table below.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Achievable Permeate Quality</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOD₅</td>
<td>&lt; 5</td>
<td>mg/L</td>
</tr>
<tr>
<td>TSS</td>
<td>&lt; 1</td>
<td>mg/L</td>
</tr>
<tr>
<td>Fecal Coliform</td>
<td>0</td>
<td>CFU/100ml</td>
</tr>
<tr>
<td>pH</td>
<td>7 - 9</td>
<td>s.u.</td>
</tr>
<tr>
<td>FOG</td>
<td>&lt; 1</td>
<td>mg/L</td>
</tr>
</tbody>
</table>
A Global Water Technology Leader

**newterra** is recognized as a leader in the development of modular treatment solutions for water, sewage, wastewater and groundwater remediation for industrial, municipal, land development, commercial & residential markets. Our heritage of innovation in providing clean water solutions dates all the way back to 1863. Over that time, **newterra** has grown to over 200 people and we’ve installed thousands of treatment systems – some of which operate in the most extreme conditions on the planet.

Full Control from Start to Finish

At **newterra**, we take full control of virtually every aspect of the treatment systems we build – from process design and engineering to manufacturing, installation, operations and ongoing parts & service support. That also includes manufacturing our own MicroClear® UF membranes in **newterra’s ISO 9001:2008 certified facility.** This award-winning approach ensures **newterra** treatment systems meet our high standards for quality and on-time delivery.

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**200+ Employees**
**40+ Professional Engineers**
**10,000+ Installations Worldwide**

**Burlington, ON**
Engineering & Sales Office

**Brockville, ON**
Head Office & Manufacturing Facility

**Calgary, AB**
Sales Office & Service Center

**Macon, GA**
Manufacturing Facility

**Venice, FL**
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**Trooper, PA**
Engineering & Sales Office

**Santiago, Chile**
Sales Office & Service Center

**Langgöns, Germany**
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