UN Water

SECURING SUSTAINABLE WATER FOR ALL

www.unwater.org
GOAL 6

ENSURE AVAILABILITY AND SUSTAINABLE MANAGEMENT OF WATER AND SANITATION FOR ALL

SUSTAINABLE DEVELOPMENT GOALS
More at sustainabledevelopment.un.org/sdgsproposal
Ecosystem Infrastructure

Modular Ecosystems for Wastewater Treatment and Bioremediation

Ecological Engineering
SDG Goal 6.2 Adequate & equitable sanitation & hygiene for all
SDG Goal 6.3 Improve water quality by reducing pollution
TYPICAL APPLICATION
1. Concrete steel or gabion as well as most other waterway edge types, vertical irregular or sloped
2. Suitable for locations with changing water levels
3. Recreational, amenity and habitat applications

KEY BENEFITS
1. Attractive waterscape planting
2. Ideal habitat for fish and biodiverse aquatic life
3. Adapts to changing water level conditions
4. Low maintenance water feature

TECHNICAL
2. Long lasting stainless steel 304 and PE Tough Floats™
3. Adjustable curvature system to match waterway contours
4. Surface and sub-surface bio-media
5. Rapid Installation

MULTIPLE PATENTS PENDING
Manila
SDG Goal 6.3: Eliminate dumping and minimise release of hazardous materials.
SDG Goal 6.3 Increase recycling & safe reuse globally
SDG Goal 6.4 Substantially increase water-use efficiency and ensure sustainable withdrawals
GOAL 9

BUILD RESILIENT INFRASTRUCTURE, PROMOTE INCLUSIVE AND SUSTAINABLE INDUSTRIALIZATION AND FOSTER INNOVATION

SUSTAINABLE DEVELOPMENT GOALS
More at sustainabledevelopment.un.org/sdgsproposal
BIOMIMICRY

Natural Engineering of Aquatic Ecosystems
Dynamic Media Biofilm System

Natural solution to a technical challenge
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Influent</th>
<th>Effluent</th>
<th>Effluent</th>
<th>Treatment Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow</td>
<td>m3/d</td>
<td>213,795</td>
<td>213,795</td>
<td>213,795</td>
<td></td>
</tr>
<tr>
<td>BOD mg/l</td>
<td></td>
<td>17</td>
<td>5</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>COD mg/l</td>
<td></td>
<td>30</td>
<td>11</td>
<td>44</td>
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<tr>
<td>NH3 mg/l</td>
<td></td>
<td>8</td>
<td>4</td>
<td>3</td>
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<tr>
<td>Reaction Rate Constant at 20°C</td>
<td></td>
<td>1.06</td>
<td>1.06</td>
<td>1.06</td>
<td>Constant</td>
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<tr>
<td>Temperature of wastewater</td>
<td>°C</td>
<td>33.5</td>
<td>24.5</td>
<td>12</td>
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<td>Reaction Rate Constant at temperature t°C</td>
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<td>1.69</td>
<td>1.26</td>
<td>1.56</td>
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</table>

**Treatment Calculations**

\[ Cn = Cm \times \left(1 + k(Vs/Qm)\right) \]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Influent</th>
<th>Effluent</th>
<th>Effluent</th>
<th>Treatment Targets</th>
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<tbody>
<tr>
<td>% age Reduction</td>
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<td>54%</td>
<td>47%</td>
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<td>n</td>
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<td>1</td>
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<tr>
<td>Mn</td>
<td>17</td>
<td>8</td>
<td>30 mg/l</td>
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<tr>
<td>Min</td>
<td>3,665</td>
<td>1,710</td>
<td>6,414 kg/d</td>
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<tr>
<td>Xs</td>
<td>300,000 m3</td>
<td>300,000 m3</td>
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<tr>
<td>Qm</td>
<td>213,795 m3/day</td>
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<tr>
<td>HRT</td>
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<td>Concentration at Reactor n</td>
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<td>1,988</td>
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<tr>
<td>Min - Mout</td>
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<td>1,093.24</td>
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SDG Goal 6.5 Implement integrated water resources management across all sectors
Attenuation
Infiltration
GOAL 11

MAKE CITIES AND HUMAN SETTLEMENTS INCLUSIVE, SAFE, RESILIENT AND SUSTAINABLE

SUSTAINABLE DEVELOPMENT GOALS
More at sustainabledevelopment.un.org/sdgsproposal
SDG Goal 6.6 Protect & restore water-related ecosystems
SDG Goal 6.6a Expand international cooperation & capacity building support to developing countries in water and sanitation
SDG Goal 6.6b Strengthen the participation of local communities for improving water & sanitation management
Thank you – from two River Warriors!
Michael Shaw

Front Desk: (44) 0 1309678100
Mobile (44) 0 7790969827
michaelshaw@biomatrixwater.com

www.biomatrixwater.com