biottta®
BIO TREATMENT PACKAGED PLANTS

FOR MUNICIPAL DRINKING WATER

AN ENVIRONMENTALLY-FRIENDLY SOLUTION FOR THE REMOVAL OF INORGANIC AND ORGANIC CONTAMINANTS FROM GROUNDWATER
Benefits of choosing biotta® include:

- Multiple contaminant removal in a single integrated treatment process with proven performance;
- Sustainable design resulting in low energy consumption and high water recovery rates;
- The treatment process does not require extensive operator experience or attention;
- No hazardous waste residual, concentrated waste, or brine discharge; process is environmentally friendly;
- Low plant life cycle costs.

How biotta® works

Naturally – occurring treatment processes are accelerated in the bioreactor where microorganisms present in the raw water are given precise levels of food and nutrients to enhance their capabilities of removing contaminants. The vessels contain granular activated carbon which creates an ideal environment for the bacteria to reproduce and thrive. The microbes destroy the contaminants or reduce them to no harmful forms and the result is clean, safe drinking water.
biottta® addresses a wide range of contaminants to below observable levels using the fixed bed treatment which fosters microbial specialization across a wide range of redox conditions. A few of the contaminants tested and addressed by biottta are listed in the table to the right.

**Typical Drinking Water Treatment Results**

<table>
<thead>
<tr>
<th>Inorganics</th>
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<tbody>
<tr>
<td>Nitrate NO₃</td>
<td>&lt; 1 mg/L N</td>
</tr>
<tr>
<td>Perchlorate ClO₄</td>
<td>&lt; 0.2 μg/L</td>
</tr>
<tr>
<td>Hexavalent Chromium Cr VI</td>
<td>&lt; 0.5 μg/L</td>
</tr>
<tr>
<td>Total Chromium Cr</td>
<td>&lt; 5 μg/L</td>
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<table>
<thead>
<tr>
<th>Volatile Organic Compounds</th>
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</thead>
<tbody>
<tr>
<td>Dibromo Chloropropane (DBCP)</td>
<td>&lt; 0.1 μg/L</td>
</tr>
<tr>
<td>Trichlorethylene (TCE)</td>
<td>&lt; 0.1 μg/L</td>
</tr>
<tr>
<td>Tetrachlorethylene (PCE)</td>
<td>&lt; 0.1 μg/L</td>
</tr>
<tr>
<td>Carbon Tetrachloride (CTET)</td>
<td>&lt; 0.1 μg/L</td>
</tr>
<tr>
<td>1,1-Dichloroethene (1,1-DCE)</td>
<td>&lt; 0.1 μg/L</td>
</tr>
<tr>
<td>1,2,3-Trichloropropene (1,2,3-TCP)</td>
<td>&lt; 0.005 μg/L</td>
</tr>
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<table>
<thead>
<tr>
<th>Qualitative Characteristic</th>
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<tbody>
<tr>
<td>Turbidity</td>
<td>&lt; 0.3 NTU</td>
</tr>
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</table>

Groundwater supplies requiring a few hundred thousand gallons per day to a few million gallons per day are addressed with the combination of model sizes and multiplying treatment trains.

**The biottta® packaged plants are offered in three models:**

- 8, 10, and 12 corresponding to the diameter of the vertical pressure vessels.

- **The biottta® 8 model** is delivered on a pre-manufactured skid which includes process pipes, controls and instrumentation for reduced engineering and site integration.

- **The biottta® 10 and 12 models** are delivered with less pre-manufactured equipment with the benefit of a reduced footprint for larger installations.

**biottta® 8 Skid-Mounted Series**

- Pre-engineered packaged plants
- Rapid installation with packaged skid equipment
- Multiplicity in plant design
- 90 point Factory Acceptance Test (FAT)

**biottta® 10 and 12 Modular Series**

- Flexibility with site installation
- Advanced engineering
- Lowest equipment capital per gallon
- Compact footprint
Traditional Groundwater Treatment of Multiple Contaminants

Air Stripping → GAC Adsorption → Ion Exchange → To Distribution

Hazardous Waste Water Residuals

biottta® Process for Multiple Contaminant Removal

biottta™ → To Distribution

Non-Hazardous Waste Water

**Standard Features**
- Remote operation, controls, and data management
- Positive feedback of process valves, water flow, and chemical delivery
- NSF International (NSF 61) components
- Underwriters Laboratory (UL) electrical control panel
- Air wash and scour
- Annual service agreement
- Performance guarantee
- Responsive delivery of nutrients

**Optional Features**
- Wastewater management system for up to 99.5% water recovery
- Waste wash water equalization tank
- Mechanical seismic calculations
- American Society of Mechanical Engineers (ASME) vessels
- Booster pump package
- Higher pressure rating options from 100 to 150 psi
- Exterior installation
- Plant operation or extended service agreement

biottta® is patented under U.S. Patent Nos. 9,580,341 and 9,856,160, with other patents pending.