Five Benefits of biottta®

1. **It’s Cost-Effective.** biottta® exerts low O&M and life-cycle costs due to the low energy demand, high water recoveries, and lack of brine waste.

2. **It’s Green.** biottta® is a low-energy system that eliminates nitrate from the environment rather than concentrating it, which eliminates high-strength brine streams and the addition of salt to a given watershed. It also can achieve water recovery rates greater than 96 percent.

3. **It’s Robust.** Hydraulic and water treatment performance is independent of raw water quality and treatment goals and is insensitive to wide swings in operating conditions.

4. **It’s Flexible.** biottta® can remove multiple contaminants in a single reactor and across a two-stage process. Nitrate, perchlorate, hexavalent chromium, selenate, arsenic, uranium, and many VOCs can be removed without multiple add-on unit processes.

5. **It’s Straightforward.** biottta® is comparable in design and operation to conventional granular media filtration. In addition, the biottta® system is highly automated, reducing the need for extensive (and expensive) operator attention.

Full-scale biottta® systems use steel pressure vessels that can be sized to meet any capacity.

What is biottta®?

biottta® stands for biologically-tailored, two-Stage, treatment approach and is the latest Carollo-developed technology to help municipalities and public agencies cost-effectively treat contaminated groundwater sources to improve local and regional water supplies.

Carollo’s biottta® process uses naturally-occurring bacteria to treat a wide range of groundwater contaminants while eliminating traditional, environmentally harmful waste streams, increasing water recovery rates, and reducing treatment costs.

For more information on biottta® consulting services or purchase, please contact us through our website or email address below.

carrolo.com/innovation/biottta
biottta@carollo.com

facebook.com/CarolloEngineers
@CarolloTweets
The biottta® system has a two-stage approach that facilitates the removal of multiple contaminants without generating high-strength, high-volume waste.

**The Six Steps of the biottta® System**

1. **Nutrient addition:** Automatic control of electron donor and phosphorus requirements to achieve microbial degradation of contaminants.
2. **Anoxic/anaerobic bioreactor:** Degrades/removes nitrate, perchlorate, hexavalent chromium, selenium, and many VOCs.
3. **Interstage reoxygenation:** Adds dissolved oxygen to the water and releases trapped nitrogen gas bubbles, if necessary.
4. **Interstage particle conditioning:** Facilitates the removal of sloughed biomass across the aerobic biofilter.
5. **Aerobic biofilter:** Degrades/removes residual carbon nutrient, hydrogen sulfide, some VOCs, and sloughed biomass.
6. **Backwash system + peroxide dosing system:** Controls biogrowth to minimize headloss and maintain uniform hydraulic conditions.

**What Does biottta® Look Like?**

System capacities range from 25 gpm to 25 mgd and up, to treat a single well or a large wellfield.
Five Benefits of biottta®

1. **It's Cost-Effective.** biottta® exerts low O&M and life-cycle costs due to the low energy demand, high water recoveries, and lack of brine waste.

2. **It's Green.** biottta® is a low-energy system that eliminates nitrate from the environment rather than concentrating it, which eliminates high-strength brine streams and the addition of salt to a given watershed. It also can achieve water recovery rates greater than 96 percent.

3. **It's Robust.** Hydraulic and water treatment performance is independent of raw water quality and treatment goals and is insensitive to wide swings in operating conditions.

4. **It's Flexible.** biottta® can remove multiple contaminants in a single reactor and across a two-stage process. Nitrate, perchlorate, hexavalent chromium, selenate, arsenic, uranium, and many VOCs can be removed without multiple add-on unit processes.

5. **It's Straightforward.** biottta® is comparable in design and operation to conventional granular media filtration. In addition, the biottta® system is highly automated, reducing the need for extensive (and expensive) operator attention.

What is biottta®?

biottta® stands for biologically-tailored, two-Stage, treatment approach and is the latest Carollo-developed technology to help municipalities and public agencies cost-effectively treat contaminated groundwater sources to improve local and regional water supplies.

Carollo's biottta® process uses naturally-occurring bacteria to treat a wide range of groundwater contaminants while eliminating traditional, environmentally harmful waste streams, increasing water recovery rates, and reducing treatment costs.

Full-scale biottta® systems use steel pressure vessels that can be sized to meet any capacity.

For more information on biottta® consulting services or purchase, please contact us through our website or email address below.

[carollo.com/innovation/biottta](http://carollo.com/innovation/biottta) biottta@carollo.com  
facebook.com/CarolloEngineers  
@CarolloTweets