



**Genotech Inc. USA**



**Total Water Management**

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## **WASTEWATER SOLUTION**

### **BioDenitrate**

**Application:** beneficial microorganisms for denitrification in wastewater.



**BioDenitrate / EW5900**

## BioDenitrate Application sheet

EW5900

### Genotech BioDenitrate

BioDenitrate is a biological formulation of beneficial microorganisms for denitrification in wastewater. BioDenitrate is used in a variety of industrial and municipal wastewater treatment plants to improve denitrification efficiency and stability.

#### **Benefits**

In the past decade, there has been an increased regulatory focus on nitrogen in wastewater. Nitrogen generally comes into municipal wastewater streams from human waste and food waste. Specialized industrial streams, as well as landfills, can also contain high concentrations of nitrogen.

If untreated, nitrate that enters the environment can stimulate eutrophication and algae blooms. In turn, this can diminish light penetration, lower or deplete oxygen in the receiving stream, and may lead to toxicity if certain algal species bloom.

Conventional biological nitrogen removal generally requires two processes: nitrification and denitrification. Nitrification is the conversion of ammonia to nitrate. Denitrification is the conversion of nitrate to nitrogen gas. Biological nitrogen removal can be performed in a variety of treatment configurations. Regardless of the treatment system, all require an aerobic zone for converting ammonia to nitrate and an anoxic zone for converting nitrate to nitrogen gas.

For years, Genotech's BioAmonia has been the industry standard for nitrification. Genotech now offer BioAmonia, a specialized blend of microorganisms for enhancing a microbial community's ability to denitrify.

#### **Performance**

BioDenitrate rate is an effective solution for starting up a denitrification reactor. A large manufacturer nuclear reactors generates 380 cubic meters per day (0.1 MGD) of "pickling" wastewater containing the 4,000 mg/L nitrate (as N) needed to start up the denitrification reactor that was recently added on to wastewater operations – see fig 1 below. They filled a 1,500–cubic meter (400,000-gallon) tank containing wastewater and glycerin as a carbon source. The goal was to have denitrification start on its own before taking on any flow. After 12 days of diluting and mixing, there was no change or detectable biological activity. The engineering company in charge recommended BioDenitrate rate to speed things up. Within 4 days, denitrification began to occur, and nitrate levels dropped from around 500 mg/L to less than 50 mg/L. This was followed by a quick spike in nitrite, before the process was completely



underway. After the start-up was complete, the unit was consistently able to achieve less than 1 mg/L of effluent nitrate.

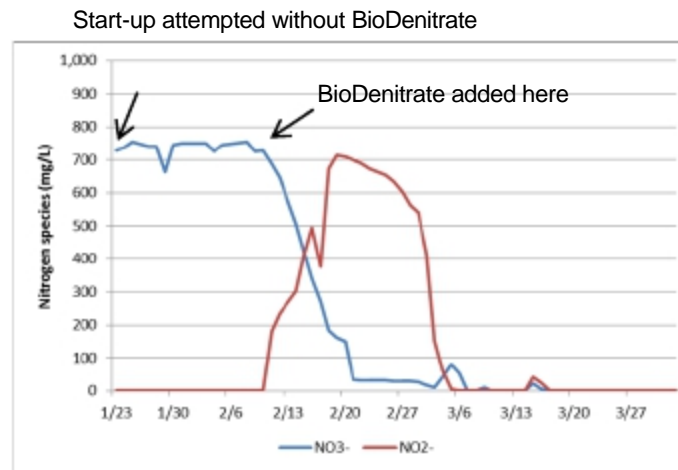


Fig. 1 Improved start-up at an industrial site with high strength wastewater.

BioDenitrate rate is useful for improving denitrification efficiency and stability. A 1.1 MGD, a municipal plant was experiencing erratic denitrification efficiency ranging anywhere from 95 to 77% removal over a 30-day period prior to the addition of BioRemove – see Fig 2 below. Over the next 10 days, efficiency steadily increased from 77% to above 90% and stayed between 90 and 95% for the next 45 days.

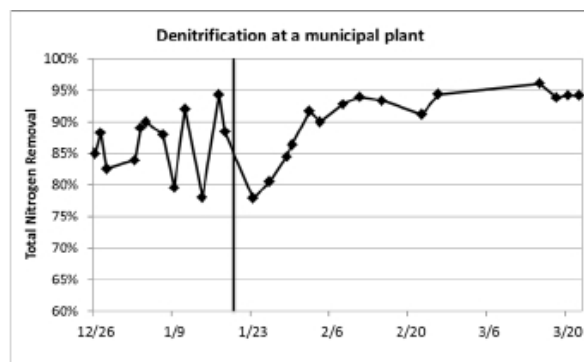


Fig. 2. Improved denitrification efficiency at a municipal plant.

## **Recommended use**

BioDenitrate rate can be used for multiple applications, including daily dosing to maintain healthy denitrifying populations, increased dosing during high nitrogen loading or upsets, and seeding during plant startups.

BioDenitrate rate is added directly to the anoxic zone of a denitrifying system. The microorganisms in

BioDenitrate rate perform best within the pH range 6.0–9.0 with the optimum near 7.0. The minimum temperature use BioDenitrate rate is 15°C. BioDenitrate rate can be used with a variety of carbon sources, including sodium acetate, glycerin, and glucose.

The dosage rate for BioDenitrate rate is dependent on a number of variables, including wastewater flow and total nitrogen loading. During the initial seeding period, an increased dosage is used to quickly establish BioDenitrate rate organisms in the system. When the denitrifying microbial community is properly grown, regular dosing is necessary to maintain an accelerated level of biological activity. Specific dosing recommendations are determined based on plant-specific conditions.

## **Product characteristics**

BioDenitrate rate is available as a dry tan powder.

## **Safety, handling, and storage**

Store in a cool, dry place. Avoid inhalation of dusts. Wash hands thoroughly with soap and water after handling. Avoid contact with eyes.