



A55L AMMONIA-REDUCING BACTERIA

CONSUMES INORGANIC NITROGEN SUCH AS AMMONIA, NITRATE AND NITRITE IN MUNICIPAL AND INDUSTRIAL TREATMENT PLANTS...

A55L ELIMINATES HIGH
AMMONIA CONCENTRATIONS
IN WASTEWATER EFFLUENT

Use in poultry and meat processing plants, and petroleum refinery applications

BIOAUGMENTATION WITH A55L CAN:

- Remove nitrogen from wastewater rather than converting it to another form;
- Significantly reduce ammonia levels, usually 40-50% within 24-48 hours;
- Enhance removal of organic nitrogen i.e. amino acids, proteins, purines, pyrimidines, nucleic acids;
- Increase wastewater treatment efficiency by at least 50%;
- Reduce plant upsets from shocks;
- Eliminate expensive surcharges due to high TKN discharge levels.

PRODUCT TEST

A poultry processing plant in the U.S. had a recurring problem of excessive ammonia levels in its effluent discharge. The plant had difficulty to meet the discharge limits based on these elevated concentrations.

Daily wastewater flow to the plant was 0.85 million gallons. Typical inlet ammonia levels were 80 - 120 parts per million (ppm) of nitrogen. The influent, after primary treatment and flow equalization, flowed into a 7.5 million gallon anaerobic lagoon followed by a series of three 0.6 million gallon aerated lagoons. The wastewater was then fed to four sequencing batch reactors (SBRs). At the end of the settling cycle, the decanted supernatant - the top, treated water layer - was discharged to a creek. The plant had difficulty keeping the supernatant treated water quality uniform.

After several techniques for ammonia removal proved unsuccessful, the plant used A55L Ammonia-Reducing Bacteria. Initial seeding was done in the aeration basin, as well as in the SBRs. The plant experienced a 40% reduction in ammonia in 48 hours and the effluent discharge fell below compliance levels. Subsequent constant inoculation with A55L kept the outlet quality uniform and the high ammonia problem was resolved cost effectively. The plant started the bioaugmentation regimen in the summer of 1996 and has not exceeded the ammonia discharge limits since, even under cold weather conditions.

SPECIFICATIONS

Description	Light beige liquid
Packaging	20L/208.37kg drums
Composition	Mixed bacteria concentrate consisting of <i>Pseudomonas fluorescens</i> and <i>putida</i>
Activity	Each lot of A55L inoculant has sufficient viable <i>Pseudomonas</i> organisms to provide a minimum of 1×10^8 viable <i>Pseudomonas</i> cells/ml at shipment.
Storage and Handling	Keep in a cool dry place

**A COST EFFECTIVE
SOLUTION TO A
COMMON PROBLEM**

A55L

AMMONIA-
REDUCING
BACTERIA

BIOAUGMENTATION METHOD

The *Pseudomonas* bacteria used in A55L product are heterotrophs and utilize organic carbon as the source for food and energy. During this process, overall nitrogen removal occurs through three separate mechanisms:

- The selected *Pseudomonas* strains have a much higher carbon uptake than what is normally encountered in a wastewater treatment system. As their carbon uptake is usually higher (because they can attack a wide range of organic chemicals), the corresponding nitrogen uptake is higher. Since ammonia is available as a nitrogen source, the ammonia consumption is increased also and the discharge ammonia levels are reduced in the treated water.
- *Pseudomonas* bacteria, considered to be the most active denitrifiers, utilize nitrite/nitrate for respiration if the dissolved oxygen drops below the critical level in the aeration tank. This also results in lower nitrogen levels.
- *Pseudomonas* are capable of utilizing nitrite as well as nitrate for growth purposes if ammonia is no longer available in the system.

Bioaugmentation with A55L results in removal of nitrogen from the wastewater rather than a conversion from ammonia to nitrate or nitrite.

COMPARISON OF TREATMENT

<u>Nitrification</u>	<u>A55L</u>
Long retention time in large tanks	Short retention time in smaller tanks COST EFFECTIVE
Temperature dependent	Wider range of temperature AMMONIA REMOVAL IN COLD WEATHER
pH 7.5 or higher	pH range 6 - 8 LESS PH DEPENDENT
Ammonia conversion is not coupled with BOD/COD reduction	Ammonia, nitrite and nitrate digestion is coupled with BOD/COD reduction FASTER
Sensitive to toxic organic compounds	Consumes organic compounds NO TOXICITY PROBLEMS
Ammonia is oxidized in the presence of air	Ammonia is not oxidized LOWER OXYGEN REQUIREMENT
Nitrite/nitrate needs to be denitrified to nitrogen gas	MOST VIGOROUS DENITRIFYING BACTERIA

APPLICATION INSTRUCTIONS

The application rates for A55L are as follows:

- Initial dosage for 200,000 gallons of wastewater is 55 gallons;
- Maintenance dosage is 4.5 gallons per week.

For further information on application, contact your BIONETIX technical representative.