



Ammonia Reduction in Petrochemical Wastewater

Product: Ammonia Treat (AM) | Full-scale industrial WWTP, 6,000 tons/day

Ammonia Treat (AM) is a high-CFU Bacillus blend built for fast, biological ammonia removal from wastewater. Instead of relying on slow autotrophic nitrifiers, AM uses hyper-ammonia-utilizing strains that take up ammonia ($\text{NH}_3/\text{NH}_4^+$) directly, paired with denitrifying strains that convert nitrite and nitrate to nitrogen gas. That heterotrophic, denitrification-based route is why AM holds effluent ammonia within permit even when conventional nitrifying bacteria stall under load, temperature swings, or high-strength influent.

Key benefits:

- **Removes ammonia fast:** hyper-ammonia-utilizing strains lower ammonia ($\text{NH}_3/\text{NH}_4^+$), nitrite, and nitrate for cleaner effluent.
- **Lowers total nitrogen:** denitrifying strains convert nitrite and nitrate to nitrogen gas without relying on nitrification.
- **Cuts BOD, COD, and sludge:** heterotrophic strains consume carbon, reducing organic load and biomass yield.
- **Improves solids separation:** supports stable floc formation and settling for clearer effluent.
- **Controls odor:** mitigates ammonia, hydrogen sulfide, mercaptans, and volatile fatty acids at the source.
- **Works across conditions:** reliable in aerobic and anaerobic zones across wide pH and temperature ranges.
- **Beyond wastewater:** reduces ammonia in animal waste systems and lowers total ammonia nitrogen (TAN) in aquaculture.

THE PROBLEM

The plant's biological treatment could not hold ammonia down. Effluent ran 6 to 8 mg/L against a new limit of 5 mg/L, and several nitrifier products, both domestic and imported, had already failed.

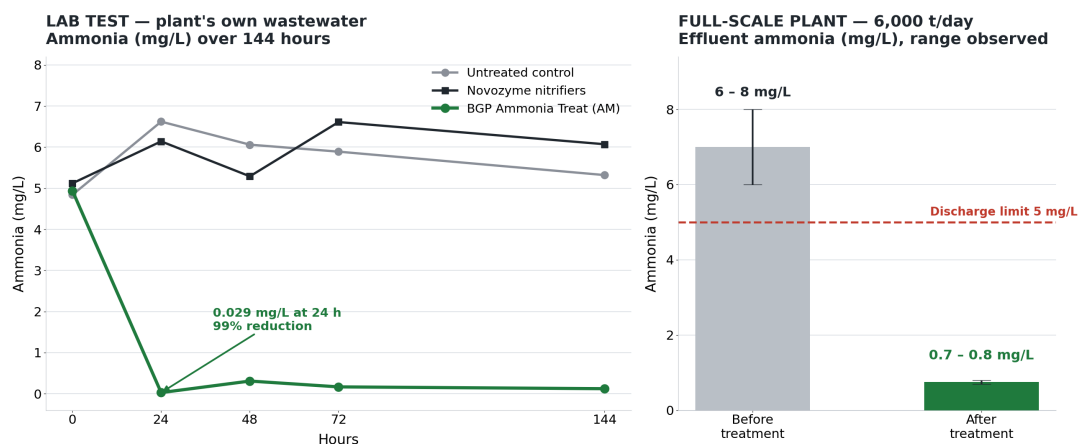
DAILY FLOW TREATED	RETENTION TIME	NEW DISCHARGE LIMIT	AM DOSE APPLIED
6,000 tons/day	6 hours	Below 5 mg/L	1.06 kg/day

WHAT WAS DONE

First, a controlled lab test on the plant's own wastewater compared Ammonia Treat against a Novozyme nitrifier and an untreated control, which set the dose. Then the plant dosed 1.06 kg per day at full scale with no change to the process or retention time.

RESULT 1: CONTROLLED LAB TEST

All three arms started near 5 mg/L. Ammonia Treat fell to 0.029 mg/L within 24 hours, a 99% cut, and held below 0.35 mg/L through 144 hours, while the nitrifier arm and the control stayed above 5 mg/L.



Left: controlled lab test. Right: full-scale plant. Separate datasets with different starting concentrations, never combined or averaged.

Time (hours)	Novozyme nitrifiers	BGP Ammonia Treat (AM)	Untreated control
0	5.12	4.94	4.84
24	6.14	0.029	6.62
48	5.29	0.310	6.06
72	6.61	0.168	5.89
144	6.07	0.124	5.32

Ammonia, mg/L. Controlled lab test.

RESULT 2: FULL-SCALE PLANT APPLICATION

This was a separate dataset with a different starting point, and no untreated control. This is the working plant rather than a bench comparison.

- **Before treatment:** effluent ammonia 6 to 8 mg/L, above the new 5 mg/L limit.
- **Three days after the first application:** ammonia at 2 mg/L, already inside the 5 mg/L limit.
- **After that:** ammonia held below 1 mg/L, settling at 0.7 to 0.8 mg/L.
- **COD:** also reduced. Ammonia Treat bacteria are heterotrophic and consume carbon.
- **Process changes required:** none. Same equipment, same 6-hour retention time.