

# Microbial & BioStimulant Solutions

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## Probiotic Solutions

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# Probiotic SOLUTIONS<sup>®</sup>

*Enhancing Nature's Science<sup>™</sup>*

Designed to Improve:

- Wastewater Treatment
- Soil Bioremediation
- Water Reuse





+ BHN WORLD CONFERENCE 2018



# Probiotic Solutions® Products

## PROVEN RESULTS IN:

- Municipal & Industrial WW Facilities
  - Collection Systems
  - Ponds & Lagoons
  - Activated Sludge Plants
  - Digesters
  - Septic Systems
- Pulp and Paper Mills
- Dairy and Hog Operations
- Man-made Lakes & Golf Course Lagoons
- Rivers and Lakes
- Aquaculture
- Refineries
- Tanneries
- Food Processing Wastewater from:
  - Abattoir & Rendering
  - Sugar refining
  - Egg Dehydrating
  - Juice Concentrating
  - Potato Chip Processing
  - Bakery Operations
  - Canning & Grain Milling Plants

...and the list keeps growing! + **BHN WORLD CONFERENCE 2018**





# What is Improved & How

## The What

- Solids digestion
- Odor control
- BOD/COD reduction
- Reduces foam
- Improves settleability
- Lowers turbidity
- FOG elimination
- Pathogen control
- Hydrocarbon degradation
- Nitrogen conversion/reduction

## Focus on Microbiology

- Nutrients
- Stimulants
- Growth factors
- Bio catalysts
- Inoculation



# Products

## BioStimulants

- Bio Energizer<sup>®</sup>
- Bio Genesis<sup>®</sup>
- Micatrol<sup>®</sup>

## Nutrients

- Super Phos<sup>®</sup>
- Super Nitro<sup>®</sup>
- CarbonX<sup>™</sup>

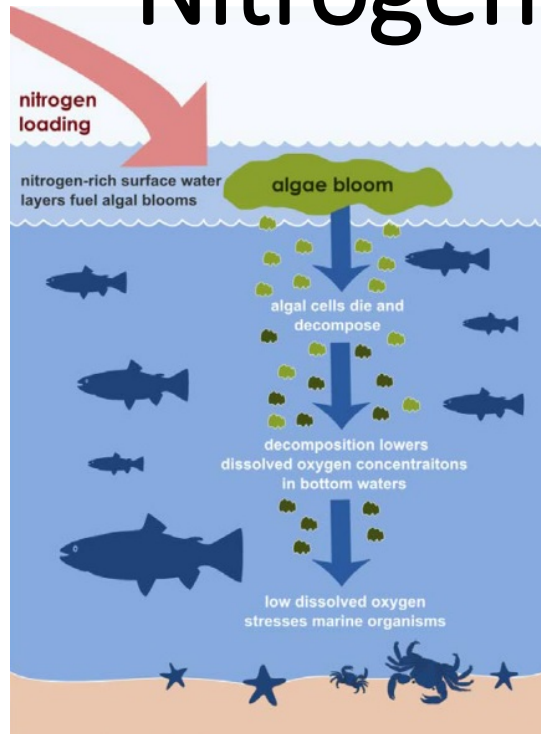
## Microorganisms

- MicroPlex<sup>®</sup> JS
- MicroPlex<sup>®</sup> FL & FLP
- MicroPlex<sup>®</sup> HS
- MicroPlex<sup>®</sup> N & Nc
- MicroPlex<sup>®</sup> DN
- MicroPlex<sup>®</sup> C
- MicroPlex<sup>®</sup> HC





# Nitrogen and Phosphorus Removal



- N & P nutrients that promote growth.
- Too much N & P causes too much growth:
  - Algae blooms
    - Eutrophication
    - Toxicity to aquatic life

**CarbonX**





# When is a Carbon Source Needed?

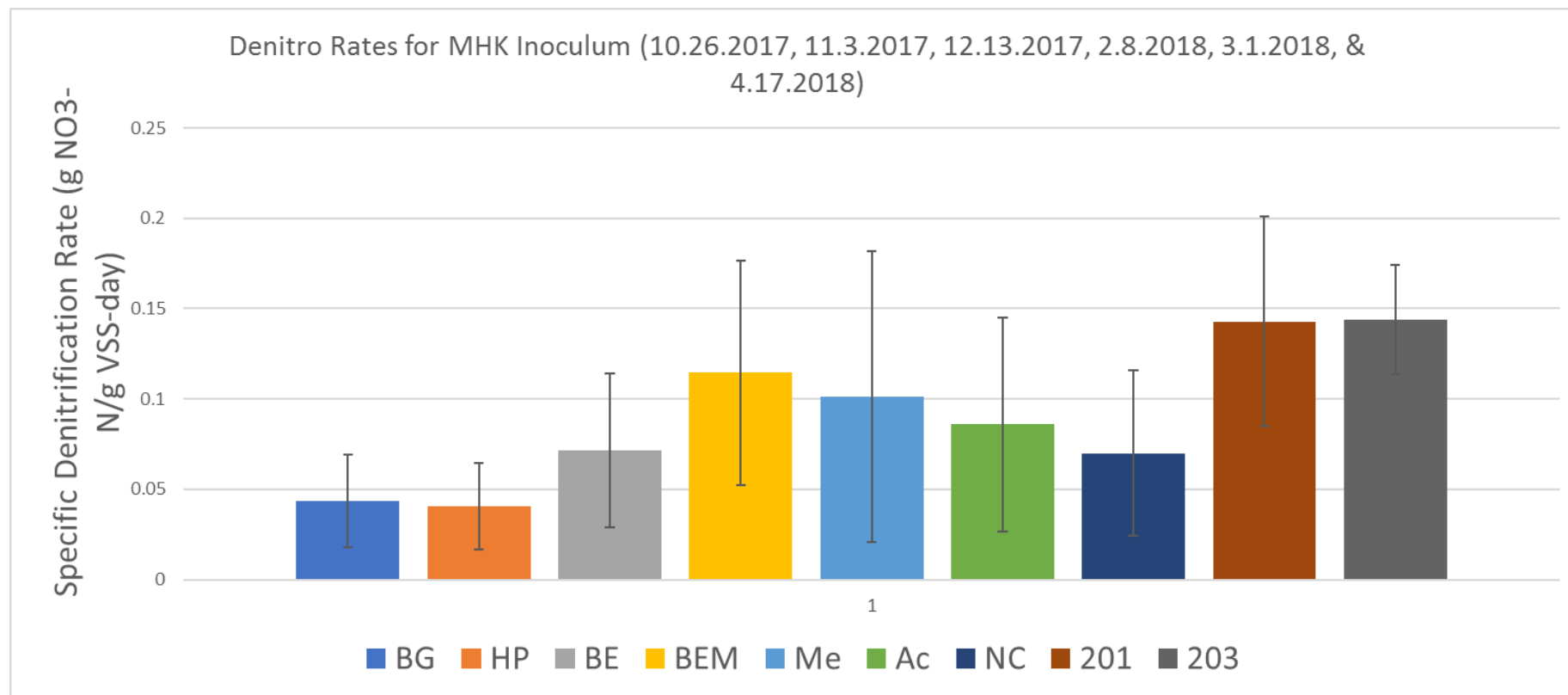
- Low Effluent Limits
- Low BOD / TKN Influent
- Low F:M Ratios
- Process Configuration Issues
- Short Retention Times
- Temperature







# Denitrification Rates

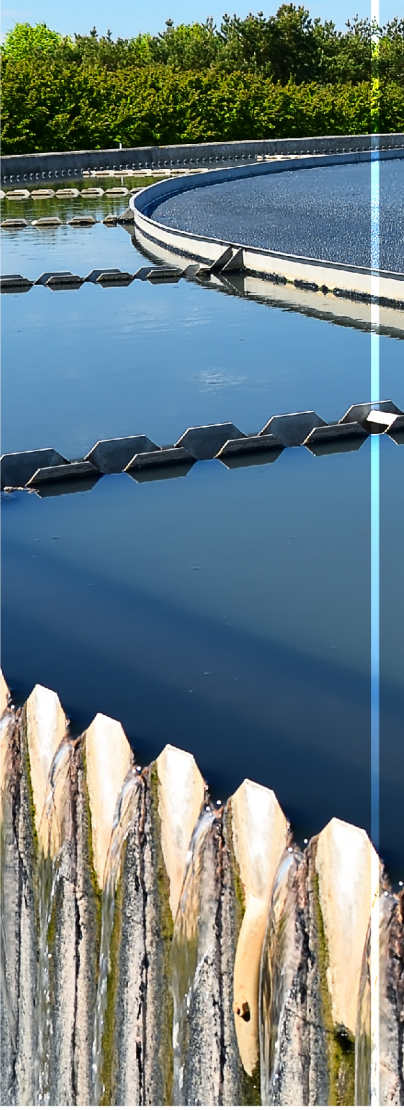






# Case Studies

## Lagoon Systems & Activated Sludge Plants







# Abattoir WW Plant, Australia

## Problem: Treatment Lagoon lost to sludge accumulation

- Lagoon 95% full of solids reduced to approximately 20% solids
- Approximately 1.3 meters of sludge removed from extent of lagoon.
- Regained treatment capacity
- Improved irrigation water quality



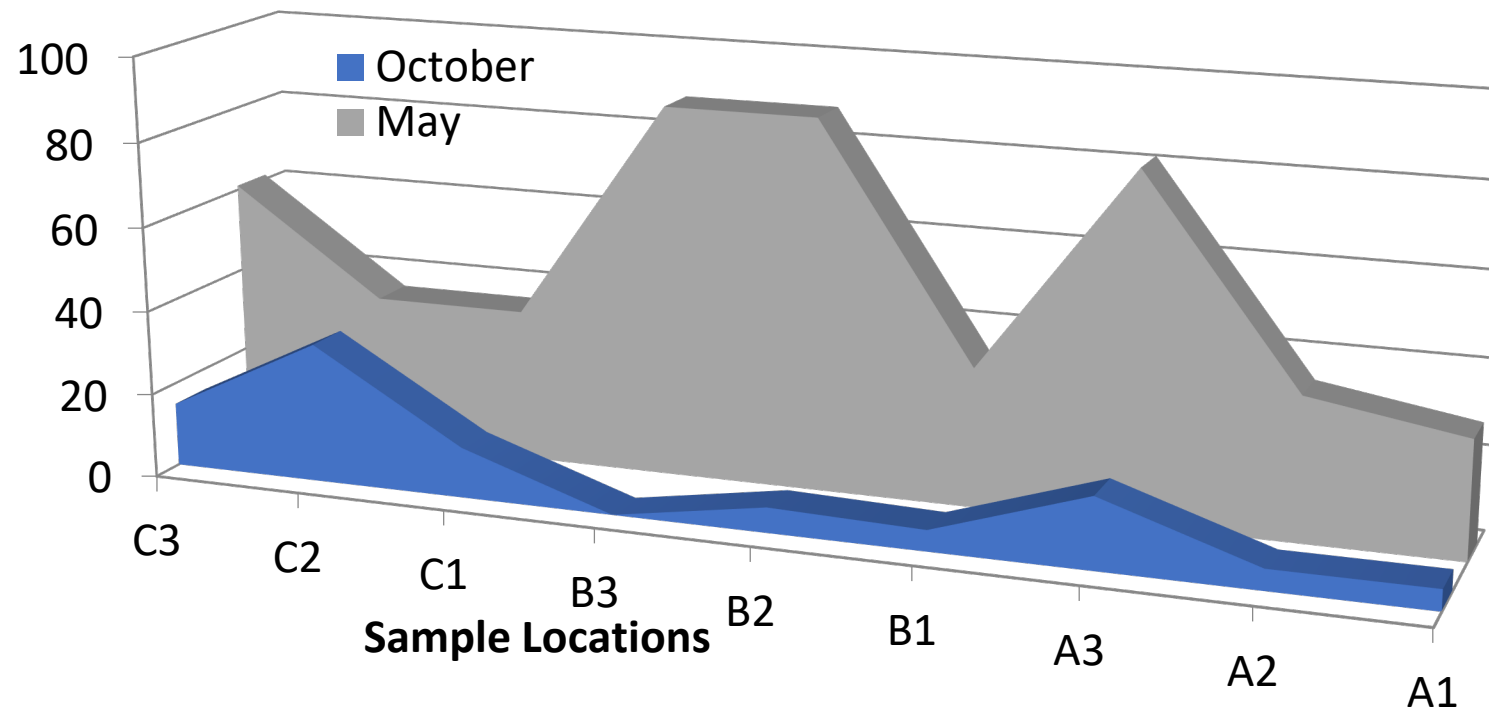




# Municipal WW Plant, Illinois, USA

## Problem: Odors, Elevated BOD, Sludge Accumulation

- Significant Sludge Reduction
- Odors Eliminated
- BOD reduced



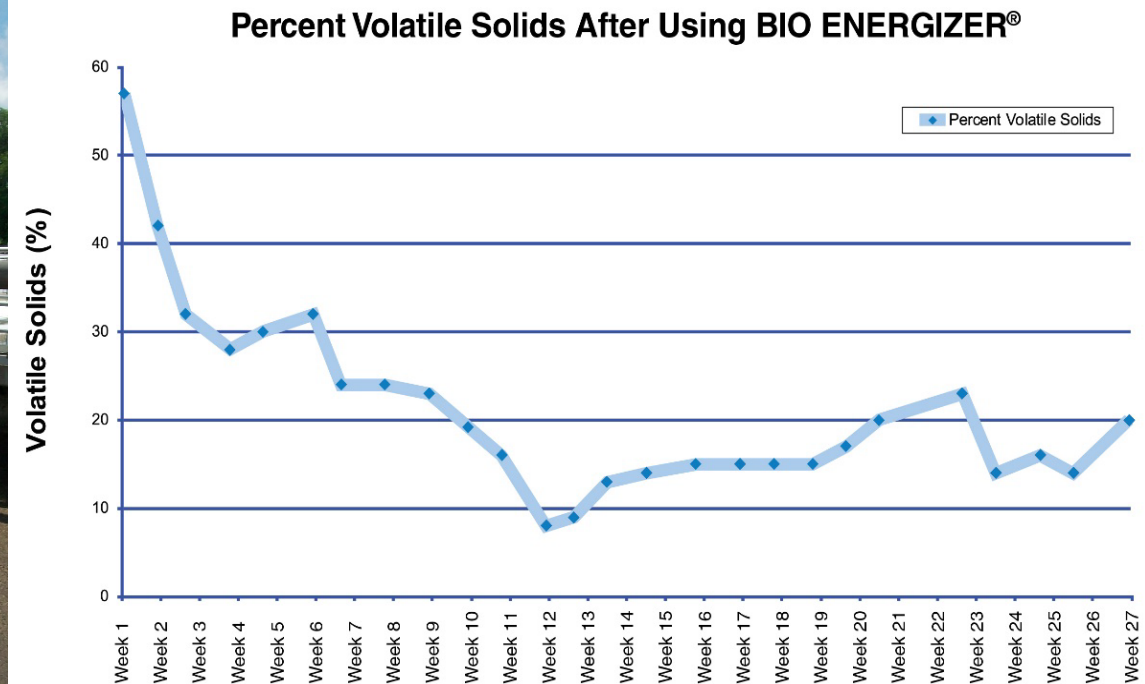
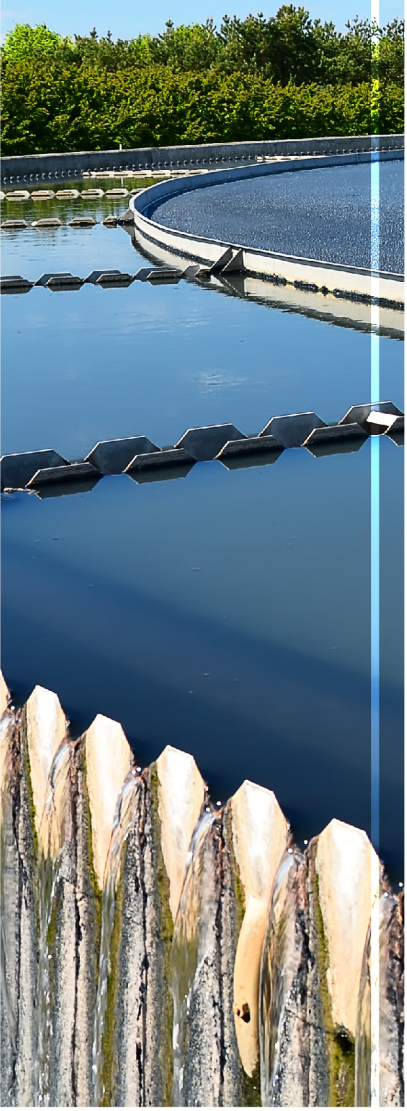




# Aerobic Digester, Missouri, USA

## Problem: Lacked Capacity, More Decant, Improved Settling

- Conducted 6-month Performance Test with 3 Different Products
- Improved Digester Performance
- Up to 85% VS Destruction vs. 45% VS Destruction
- Better Settling, Double Decants, Greater Storage Capacity







# Septic System, Massachusetts, USA

## Problem: Sludge Build-up, Leach Field Backing Up, Odors

- Sludge and scum reduction
- Odors eliminated
- No standing water in leach field





# Paper Mill WW Plant, China

## Problem: High Phosphorus Use

- 75% Phos Acid Reduction
- Stable Biomass

Index	#3 SBR Tank	#4 SBR Tank
COD Removal Rate	84%	81%
Avg. MLSS	1941 mg/L	1949 mg/L
Avg. SV30	72	73

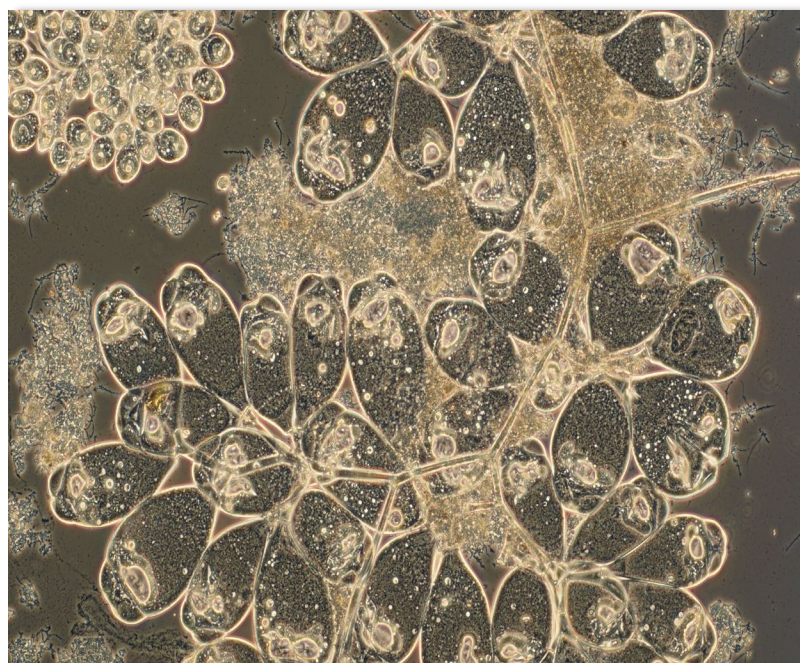




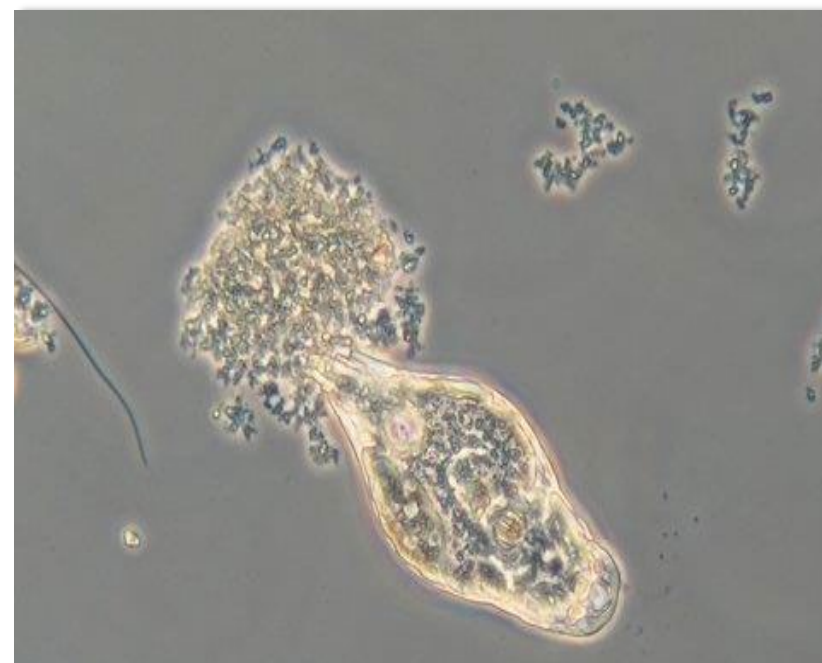
# Paper Mill WW Plant, China

## Problem: Upset Recovery

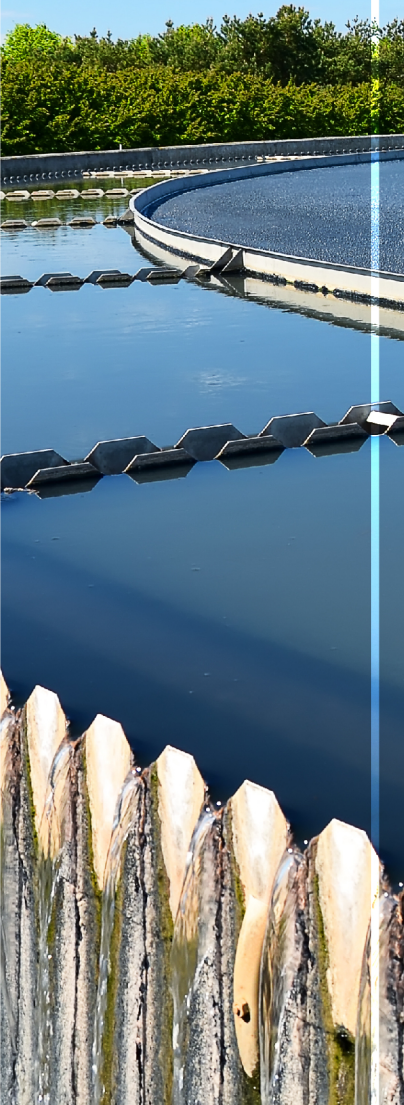
- Shortened recovery time by 75%
- Stable biomass, rotifers & ciliates returned
- Reduced pin floc and filamentous bacteria



Stalked Ciliates



Rotifers





# Activated Sludge Plant, Idaho, USA

## Problem: Exceeding Ammonia Limit

- Restored nitrifiers
- Achieved ammonia permit levels within 3 days

Dated	East Train Ammonia [mg/L]	West Train Ammonia [mg/L]
9-28-17	11.90	23.1
9-29-17*	11.10	18.2
10-2-17	0.24	14.1

\*Note: No testing performed over 9-30 and 10-1

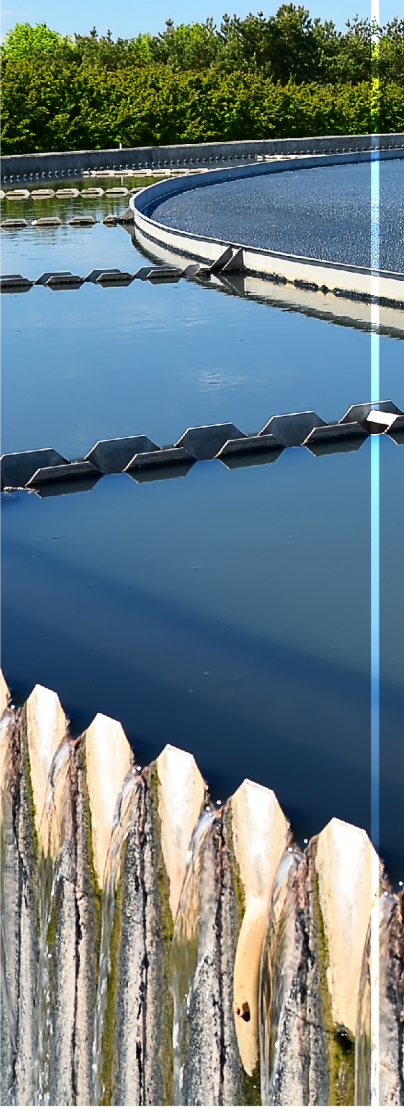




# Activated Sludge Plant, Peru

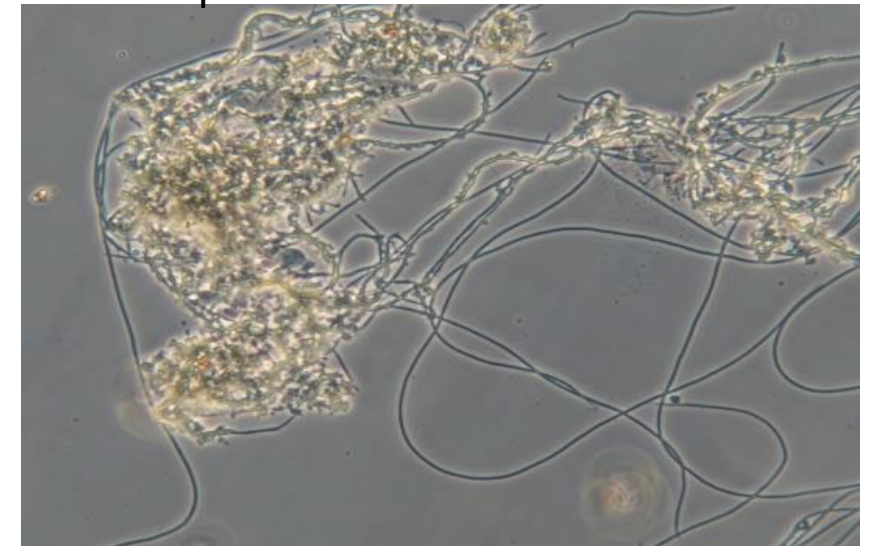
## Problem: New Plant Start-Up

- Rapid Microbial development
- Improved Plant Performance
- Reduced Foaming, Reduced Filamentous Bacteria and Improved Settling



Excessive Filamentous Bacteria

Acceptable Filamentous Bacteria





# Improving the Environment

- Probiotic Solutions® products reduce contaminants by focusing on improving the microbiology
- Wastewater Treatment improvements across the globe
- Soil contamination reduction is also improved via our products
- Take a look at some of our videos for further information at [www.probiotic.com](http://www.probiotic.com)
- Let's us know how we can help you





THANK YOU  
from  
**PROBIOTIC SOLUTIONS®**  
*your wastewater solution provider*