



# Dairy Industry Case Histories





# Case History: Dairy



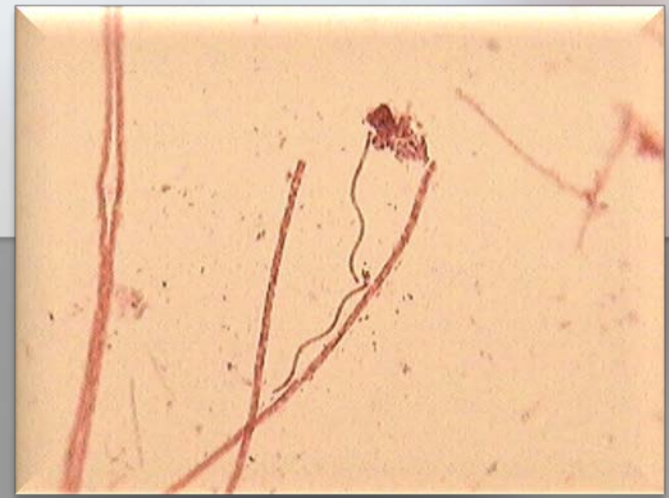
**Operator training, system optimization- Dairy processing Audit- Case History at a Dairy processing plant- Milk and Yogurt**



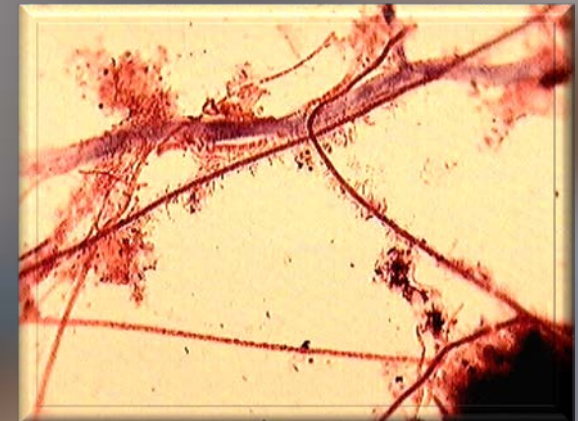
Spirillum was also present in this plant. They were limited by digester space and dewatering due to the fact that they had so many filaments and they were taking up space. Another problem they had was ashing on the clarifiers. We looked at all their plant data

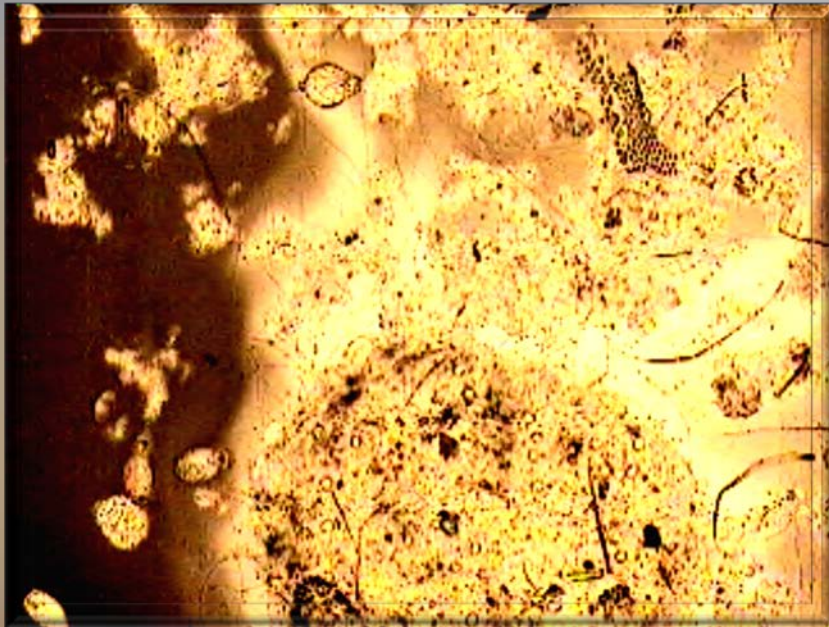
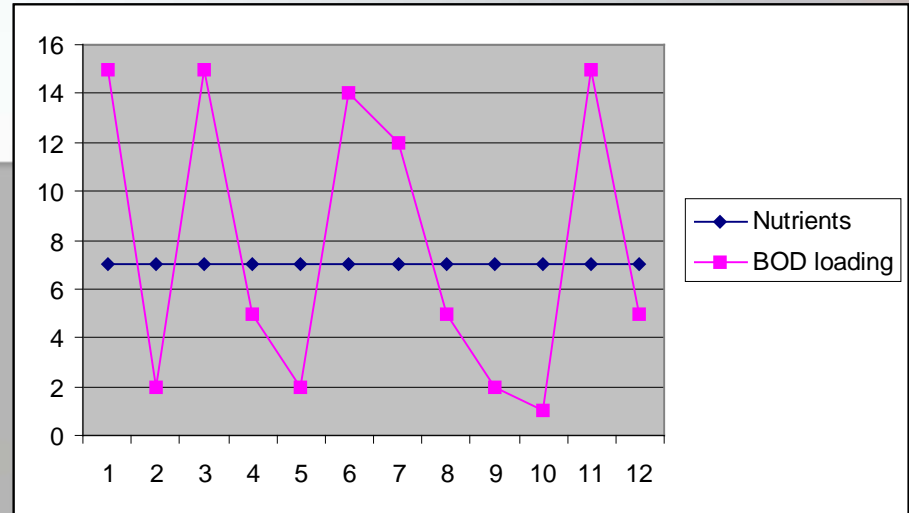


Any time you see spirillum in a plant, this indicates septicity somewhere. Check EQ tanks or clarifiers. In this case, the clarifier bed was too thick and ashing and gassing were apparent on the surface



1000x Gram stains Type 021N and Type 0041  
1000x Gram stains Type 0041, 1851 and 021N





**This plant did what we recommended though. The biggest benefit was the settling to the clarifier in the cold months. The 1/2 hour SVI had over a 62% reduction from 740 ml in the settleometer down to 280! This made a difference in solids handling also! What a simple fix, just add nutrients and make minor adjustments to the clarifier!!!**

[www.EnvironmentalLeverage.com](http://www.EnvironmentalLeverage.com)

**Two years later, operator won “Plant of the Year” award!!!!**



# Cheese Factory Illinois



Significant  
foaming with  
*Nocardia* and  
nutrient  
deficiency



Frozen foam  
had to be  
shoveled off  
clarifier





# Cheese Factory Illinois

**Bioaugmentation in Lift station  
and Aeration Basins  
Grease control upstream  
Nutrient addition optimized  
Mixing and Aeration in EQ tank**





# Dairy and Cheese in Wisconsin



**Overdose of  
Ferric  
Trying to remove  
Phosphorus**

**Caused nutrient  
deficiency**



# Dairy in Ohio



High TSS- Polymer usage  
Foaming  
High Grease  
Poor Nutrient Addition





# Dairy Drain Optimization



We work with numerous dairies, milk, cheese, ice cream, whey, etc. Very high BOD from these sources, especially during equipment clean out. Many discharge to a city. The use of MicroClear L100 liquid into drains or MicroBlocks lowers surcharges and usage fees to city



# Lift Station Drain Optimization



MicroClear®  
MicroBlocks lowers  
surcharges and usage  
fees to city





# Dairy wastewater Characterization benchmarks

Table 3. BOD<sub>5</sub> and COD Values of Pure Dairy Products.

Product	BOD <sub>5</sub> (mg/l)	COD (mg/l)	BOD <sub>5</sub> /COD
Milk	104,600	173,000	0.60
Ice cream (10% fat)	292,000	540,000	0.54
Whey (acid)	32,000	70,000	0.54

Table 8. Raw Wastewater Volume Attainable Through Good In-Plant Control

<u>Subcategory</u>	<u>1/kgg M.E.*</u>	<u>1/kg BOD<sub>5</sub></u>	<u>gal/1000 lb M.E.</u>	<u>gal/1000 lb BOD<sub>5</sub></u>
Receiving Stations	999	9.6	120	115.5
Fluid Products	4663	44.9	560	539.0
Cultured Products	4663	44.9	560	539.0
Cottage Cheese	9243	89.0	1110	1068.3
Natural Cheese	999	9.6	120	115.5
Ice Cream Mix	2498	24.0	300	288.7
Condensed Milk	4746	45.7	570	548.6
Dry Milk	2248	21.6	270	259.9
Condensed Whey	1249	12.0	150	144.4
Dry Whey	1249	12.0	150	144.4

\*M.E. - Milk equivalents



# Dairy Feed Lot Optimization Washington



This plant had issues with capacity and meeting discharge permits. Onsite audit, recommendation on nutrient addition as well as Bioaugmentation MicroClear 207 and Micronutrients MicroClear



# Dairy Wastewater Loading

Dairy Wastewater Characteristics (Wright, 1996)

Potential pollutant source	Biochemical Oxygen Demand ppm	Nitrogen ppm	Phosphorous ppm	Volume gallons per 100 cows
Milking Center waste	400-10,000	80-900	25-170	73,000
Silage Leachate	12,000-90,000	4,400	500	105,000
Barnyard Runoff	1,000-10,000	50-2,500	5-500	80,000
Dairy Manure	20,000	5,600	900	660,000
Domestic Waste	150-250	20-30	5-10	365,000



# Environmental Leverage

## The Next Generation of Solutions

- *Chemicals, Laboratory, Training, Consulting, Total Systems Approach*
  - Onsite Audits & Consulting
  - Beneficial Reuse & Biosolids Alternatives
  - Training Programs
  - MicroClear® & MicroSolv™ Bioaugmentation Products
  - Cooling Tower & Wastewater Lab Services
  - Computer Based Dosing Wizards
  - Wastewater Audits
  - Online ELearning Courses





# Wastewater Training Programs

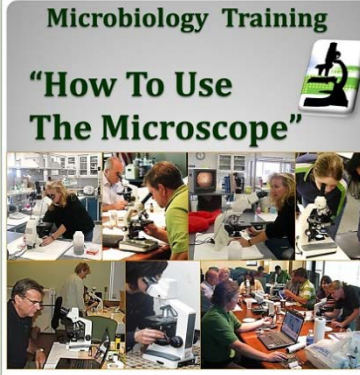
## Wastewater Training Materials 4 – CD Set

Higher Life Forms CD  
Filamentous Bacteria CD  
An Overview of Wastewater Training  
Wastewater Microbiology


Filamentous Identification  
The Easy Way™ Training CD  
Powerful Filamentous Training

Custom Training CD or Manuals

**Microbiology Training**  
“How To Use  
The Microscope”

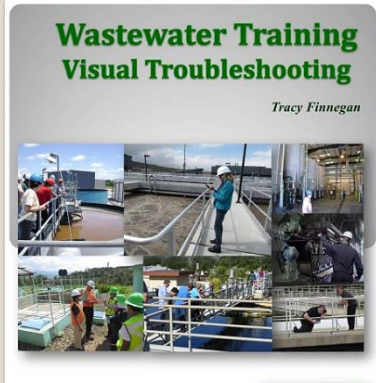


Training & Hands On  
Workshop  
Presented by Tracy Finnegan

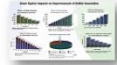



**Wastewater Training**  
Visual Troubleshooting

Tracy Finnegan

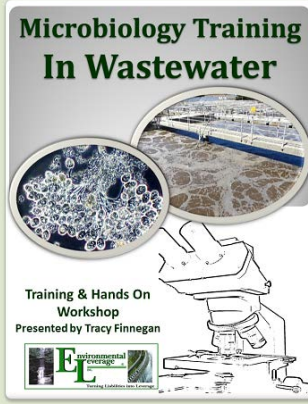


Environmental Leverage  
Turning Limitless Into Leverage




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**Microbiology Training**  
In Wastewater




Training & Hands On  
Workshop  
Presented by Tracy Finnegan




**Microbiology Training**

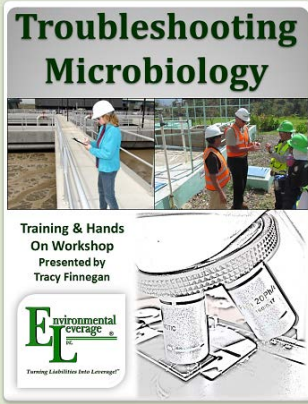
**Indicator Organisms**




Training & Hands On  
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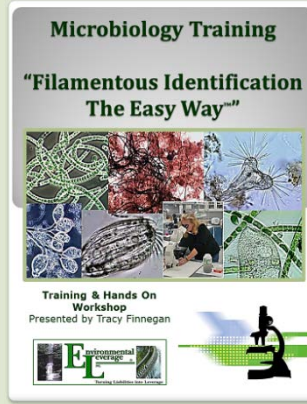
**Troubleshooting**  
Microbiology




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**Microbiology Training**  
“Filamentous Identification  
The Easy Way”



Training & Hands On  
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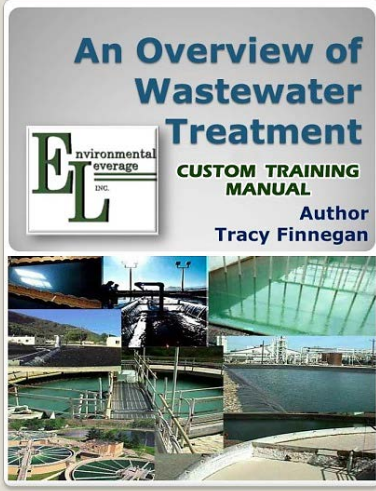


**An Overview of  
Wastewater  
Treatment**

Environmental Leverage  
INC.

**CUSTOM TRAINING  
MANUAL**

Author  
Tracy Finnegan





# Wastewater ELearning Training

**Environmental Leverage**  
Wastewater Training Courses

## WELCOME TO WASTEWATER E-LEARNING

**Our First Set of Classes started in April 2016**  
Create a new account and Log on to register for the classes you would like to take. If you need help, you can check out the FAQ, take a preview at the Course Demo or contact our office.  
**For our company's complete line of services, training materials and biological products you can visit our Website at [www.EnvironmentalLeverage.com](http://www.EnvironmentalLeverage.com).**

### Wastewater Training Courses Overview

Control and Minimization of Total costs of operations is always necessary, but guaranteed reliability and long term sustainability are the keys to transport your wastewater treatment system above and beyond normally targeted measures. These wastewater training programs are based upon years of experience and accumulation of practices on actual performance of thousands of treatment systems. These wastewater training programs have been consistently successful in teaching people how to be proactive and achieve their goals of reducing Total Costs of Operation while also achieving compliance.

You will learn step by step procedures which will enable you or your operators to develop quick, easy to establish system checks to control and monitor your system in order to predict upsets, minimize energy and chemical usage, and avoid costly repairs and unnecessary maintenance procedures.

These courses have been pre-approved for Wastewater CEUs in Alaska, California, Connecticut, Idaho, Indiana, Maine, Massachusetts, Nevada, New York, North Carolina, Tennessee, Vermont, Washington and West Virginia. Some states do not require pre-approval. If you need these approved for your state, please contact our office.  
These courses are eligible for CEUs, Contact Hours or PDH (Professional development hour) in Alabama, Arizona, Maryland, Virginia and more to come.  
Now approved in Canada for Nova Scotia and Saskatchewan.

**Training Course Summary PDF document**  
Please see attached list of current courses. This list details the training courses, a brief description, activities included, course cost and typical Contact hours awarded. Keep in mind your state may vary. Some states award 1 CEU per hour of training. Some 1 CEU some 0.5 If you have questions, please contact us on your local licensing board.

Search courses:  Go

### Courses

[Course Demo](#)

## Online ELearning: Wastewater Training Courses Overview

Control and Minimization of Total costs of operations is always necessary, but guaranteed reliability and long term sustainability are the keys to transport your wastewater treatment system above and beyond normally targeted measures. These wastewater training programs are based upon years of experience and accumulation of practices on actual performance of thousands of treatment systems. These wastewater training programs have been consistently successful in teaching people how to be proactive and achieve their goals of reducing Total Costs of Operation while also achieving compliance.

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These courses have been pre-approved for Wastewater CEU's in Alaska, Arkansas, California, Connecticut, Delaware, Georgia, Hawaii, Idaho, Illinois, Indiana, Louisiana, Maine, Massachusetts, Minnesota, Nevada, New Jersey, Kentucky, New York, North Carolina, Rhode Island, South Dakota, Tennessee, Vermont, Washington, Wisconsin and West Virginia. Some states do not require pre-approval. If you need these approved for your state, please contact our office.

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Now approved in Canada for Nova Scotia and Saskatchewan.

\*\*Some states give different credits than others. Not all states give credits solely based upon contact hours. Please contact our office if you need to know the approval codes and credit hours for your specific state.

**Just Released \*\*\***

**Secondary Clarifiers, Secondary Biological Wastewater Treatment systems, Nitrification and Denitrification, Spanish Wastewater Basics, Filamentous Identification Introductory Course Coming Soon :Filamentous ID the Easy Way**

- Online computer-based training
- Interactive courses with videos, photos, & quizzes
- Convenience and flexibility at individual pace
- No travel expenses or hassles.

**WastewaterElearning.com/elearning**

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# Environmental Leverage Analytical Services

- Wastewater Biomass Analysis
- Filamentous Identification
- Cooling Tower Microbio Analyses

Environmental Leverage Inc.

Wastewater Microbiology Lab Testing

Standard Wastewater

Biomass Analyses :

Cover letter with comments, recommendations and troubleshooting tips.

Higher life form sheet

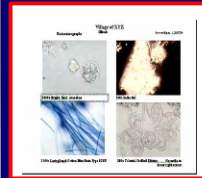
Floc structure analyses

Photo Sheets

A CD with photos and videos included \$250.00

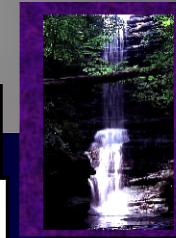
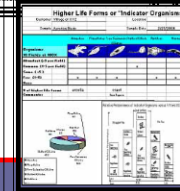
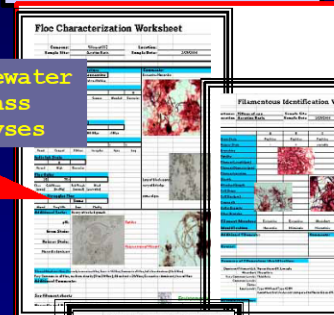
India Ink and LactoPhenol Cotton Blue Stains

Filament Causes and Controls

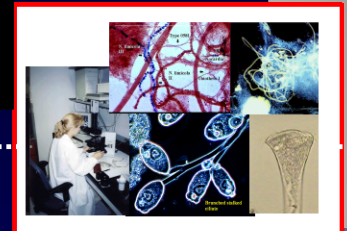


Wastewater Biomass Analyses with Filamentous Identification including Gram and Neisser stains, suggestions on causes and control, troubleshooting tips as well as the standard analyses. \$350.00

Wastewater Biomass Analyses

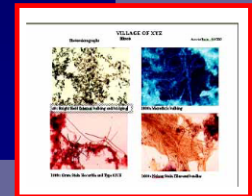


Always striving to bring the latest technology available to you!



Send 50-100 ml sample in plastic container overnight. No ice cubes, blue ice only. Call to set up sample testing 630-906-9791. Results same day as sample received

Filamentous Identification



Quality • Service

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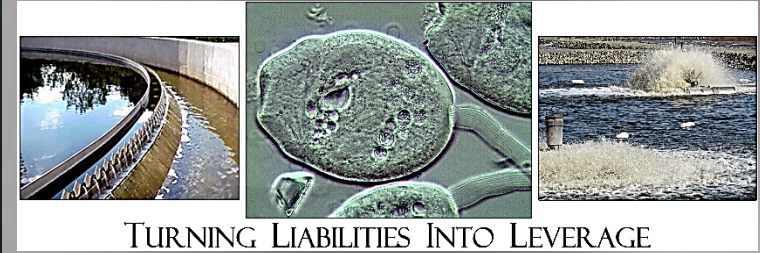
**Quality Environmental Products and Services!**

With all the concerns today about environmental liability, some of the key issues that manufacturers face include: Globalization, impact of new Science and Engineering technology, Information systems and e-Commerce, Supply chain management, Changes in production processes and manufacturing, Sustainability, Significant impact on Energy savings and Environmental performance. At Environmental Leverage all of these issues are important concerns.

**Capabilities:**

**What's New!**

We have just added "Virtual Audits" to our capabilities. Check out our new Services. We are in the process of developing an "Online E-University" in order to meet the needs of our global customers that cannot travel to our



**Photo Gallery - Mystery Bug of the Month**

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- Bug of the Month

**Biological Products:**  
Biodegradation products for applications in Papermills, Textiles, Chemical, Tanneries, Meat processing, Textiles, Steel, Agriculture, Animal feedlot, Gas Powder plant, Food and Beverage, Dairy Products, Orange Juice factory, Wineries, Cookie factory, Vegetable processing plant, Meat packing, Slaughterhouse

**Mystery Bug of The Month - From 2004 - 2017**

**Free swimming ciliates**

These photomicrographs were taken from a wastewater sample. Most of the objectives used were 100x, 400x and 1000x. You can see this free swimmer open what looks like a flap to capture food. Notice how when you go from low power to a higher magnification, more details jump out. Do not be afraid to go up to a higher magnification, even 1000x!

**What's New!**

We now have a brand new "Higher Life Forms videos" in our Training CD list. Check out our new Training Materials. We are also in the process of developing an "Online University" in order to meet the needs of our global customers that cannot travel to our public classes. Stay tuned for details and updates.

- Training & Treatment Systems Audits
- Newsletters (*digital monthly troubleshooting*)
- Troubleshooting
- Filamentous ID.
- Higher Life Forms
- Bug of the Month
- Microscopic Biomass Analyses



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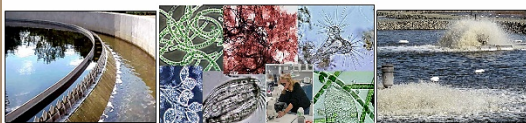
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