



June 2010

The Wastewater Insight

The wastewater insight

MYSTERY BUG OF THE MONTH



We started this month out with a new

Mystery Bug of the month!

Check out our website for more photos of our new mystery bug!!!!
WWW.EnvironmentalLeverage.com

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Oil and grease- What they are composed of and how to handle them

We have had a run of customers the past few months with issues. There seems to be a misconception about oil and grease. These can come in many different forms.

You can have oils due to lubricants leaking off equipment, oils from food processing, grease due to fats from animals that are processed or cooked. Municipalities can get oil during construction season when rains wash down oils into parking lots or streets if rainwater ends up in the collection systems.

Food processing can be very high in oils. Fruits, juices, beverages that use fruit juices, vegetable processing, corn, soybean, meat processing, bakeries, and the list goes on and on when it comes to food plants as far as sources of different oils and grease.

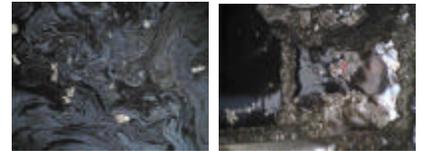
Hydrocarbon oils, although different in appearance and chemical make-up, still impact the bacteria in similar ways.

Technically to bacteria, whatever the oil source, it is still food to the bacteria and all different kinds of oil are biodegradable. The better the environment, the quicker they degrade. Under adverse conditions, you can develop Nocardia, M. parvicella- filaments that cause foam.

Zooglea may also develop.



Lift station with oil and solids



Oils in lift station can start to develop bacterial growth in the lift station or fungal mattes.



Lubricant oils food plant



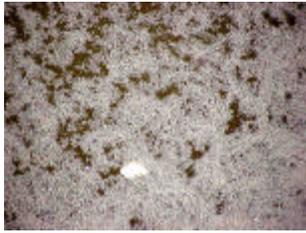
Meat packing plant- Food oils and grease



Chocolate Factory- Chocolate as well as peanut oils or other ingredients that generate oils



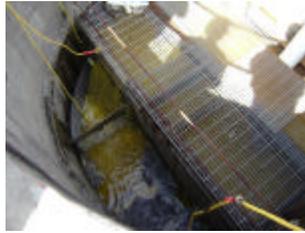
Frosting plant- Shortening and food oils



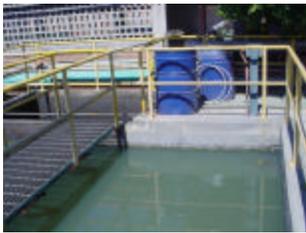
Municipality- Oils and grease



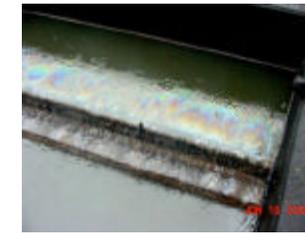
Oil at juice plant



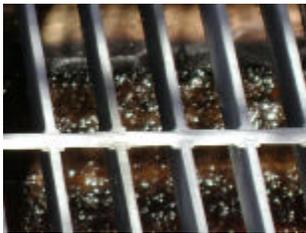
Papermill oil- Lubricant oils from machines- Tall oil



Chemical plant oils- Process oils or hydraulic oil leaks



Refinery- Hydrocarbons and petroleum



Pesticide manufacturing- Hydraulic oils



Natural Gas- Hydrocarbons



Chemical Plant- Manufacturing oils



Lawnmower blade manufacturer- Cutting oils



Cheese Plant- Food oils





Meat Packing plant- Sauces and food oils and grease



Steel mill- Oils

Did you know .1 gram of grease can have a BOD as high as 1-4 million BOD? Did you know antifoams that are oil based can have BOD's as high as 2-300,000 ppm of BOD?

What can you do with oil and grease?

Oil recovery and reuse



Many plants try to capture the oils with DAF, skimmers, API or other ways so the oil can be reprocessed, reclaimed or reused. Beneficial reuse is the new green approach. Also, many new companies are now starting to make biodiesel fuels out of grease and oils.



Oil is actually taken out of soil for use in many applications. This is up in the Alberta tar sands where we audited a plant.

When the amounts of oil are too little or too contaminated to be reused or recovered, bioremediation can be used to naturally break down the chemicals.



Tank remediation is easy and often performed at petrochemical, refinery and chemical plants. Batch treatment in a separate tank is used to naturally degrade the organic oils and grease using biological supplements. We have performed numerous applications in these types of scenarios. Please let us know if you would like some of those case histories.

Taking oil out of soil or rivers is usually a bit harder to do but is still possible.

Oil Remediation in Israel- Soil Remediation

Industrial zone Alon Tavor Israel

Plant Issues

900 m3 of Contaminated Soil.

Pollution: Crude oil.

Several options were evaluated and E. H. Green/ Environmental Leverage bioaugmentation program solution was elected.

Due to the hydrologic area which the plant is located in, the EPA of Israel instructed the plant to move the soil or reduce the TPH (Total petroleum Hydrocarbons) from 842 to 100 ppm. Initial proposal assumed that it would take a few months due to high heat in the summer, and mainly the amount of soil and contamination to treat. After two weeks, TPH was down to 311, the following week, 133.

Final TPH levels were pulled at 4 locations- 38, 39,81 and 37 were the final TPH readings, ~90-95.6% reduction in TPH (Total petroleum Hydrocarbons) 80% cost reduction in treating the soil biologically including labor, nutrients, biological products, etc vs. hauling out the dirt as hazardous waste~

Starting of the project was on the 04/12/2008





Metal and large debris was removed; soil was spread out across the land. Bioaugmentation products were applied. A dual program of 1/2 MicroSolv 400 and 1/2 MicroClear M100 micronutrients was used.

Ammonia and phosphorus were applied. Soil was kept moist.



Lakes and rivers:

Boat motors can add high levels of oils to waterways. Beaches where sunbathers use high levels of sunscreen can add more oil to the water. Oils can be degraded safely

with Bioblocks.

How do I add bioaugmentation products to help degrade oils and grease?

Lift Stations, Aeration basins and Digestors may have grease.

Digestors commonly end up with build-ups of grease due to solids and floating grease from the primary being sent to the digester.

Grease is one waste that the sewer system cannot handle and therefore needs to be kept out of the system, but most often is not. An additional concern is that since the government raised the temperature required by restaurants and food establishments from 180° F to ~210° F, grease traps are not working as designed and grease that used to be trapped onsite is now washing through the lines until the temperature of the water cools down and then hardens later on. This usually happens somewhere in the lines or in the lift station.

Biological additives are a safe, natural, environmental friendly way to help assist in the cleaning up of a lift station, but they are not miracle workers. There is a limit to what they can do, how they do it and when they will work. Bacteria can naturally degrade the fats, oils and grease, as well as any other organic materials that enter a lift station or pipe. They actually consume these as a food source, as opposed to traditional



methods of surfactants, enzymes or chemicals that may have eliminated the grease in the lift station, but just transferred them down the pipe and eventually into the wastewater treatment plant and can cause upset conditions. Biological products cannot in a realistic time degrade some of the solids such as plastics, condoms, etc. that wind up in the lift station or the treatment plant. Some of these eventually build up and must be physically removed.

Bacteria not only clean the lift stations if properly applied, they can help clean up the lines and can lighten the load at the treatment plant and reduce solids or help with BOD and TSS loading. Again, it is all in the program addition; conditions such as flow, temperature and loading impact whether a program will impact just the lift station, the pipes or the treatment plant alone. It is always a time and numbers game in wastewater biodegradation. With bioaugmentation, you are cheating and supplementing the numbers. Depending upon where you add the bacteria, especially the further upstream you add them, the more time you are allowing the bacteria to degrade the organics.

Please let us know if you have issues with grease and oils. We can help design a program for your specific site.

Training classes:

We have had numerous requests for our next class. Well we finally set one up! We have been working with many wineries, especially in Napa Valley, so July 8th, we are having a class in Napa. There is limited seating, so book early.

Course Outline



Basic Activated Sludge Microbiology
Hands on Microscopic Observation
Process Overview and Process variations
Process Control Strategies
Plant walk through
Troubleshooting Activated Sludge Processes

Visual Physical Observations

Filaments and Foam control

Solids Carryover and Settling Problems

If you are willing to host a local class, please let us know. The host class does get a discount on attendees.

Websites:

<http://www.grants.gov/>

<http://cfpub.epa.gov/si/>

EPA Science Inventory

<http://response.restoration.noaa.gov/index.php>

NOAA

<http://www.cdc.gov/niosh/npg/>

NIOSH pocket guide to chemical hazards

Last Month's
MYSTERY BUG OF THE MONTH



This is a cluster of flagellates

Usually this is found in a very young sludge age. Notice the green color. This means there is a lot of sunlight available. Usually these are found in lagoons, ponds, or areas where sunlight is plentiful. Typically in most activated sludge plants, the MLSS is thick enough, so sunlight does not penetrate into the biomass. Algae can grow on weirs though, so any time you see green, whether in flagellates or filaments, check for solids build-up around edges, weirs, clarifier centerwells, etc.

If your system is young consider bioaugmentation.

Mystery Bug of the month!

Check out our website for more photos of our new mystery bug!!!!

WWW.EnvironmentalLeverage.com

Phone: 630-906-9791

Fax: 630-906-9792

E-mail: ELFEnvironmental@aol.com