



New Environmentally Friendly Enzyme Based Solution for Wastewater Remediation

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The effluent generated by livestock at agricultural operations all over both North and South America has a significant environmental footprint that flows far downstream from its source. Most notably present in these effluents, or agricultural runoffs, are manure and urine as well as other contaminants resulting from the continuous requirements and byproducts of livestock production. The increased global population has meant an increased demand for food and a subsequent high demand for livestock and farm products, which has also meant a larger environmental footprint is produced.

Blue Ribbon, a company who manufactures various pork products, has an operation near Panama City, Rep. de Panama where they raise approximately 1000 - 1500 hogs. Blue Ribbon was very concerned about their environmental footprint due to the drainfield of their effluent ponds flowing directly into a nearby stream. For well over a year now, Blue Ribbon has been using a product called "UltraZyme" produced by a Canadian Firm "Cypher International Ltd.", to effectively clean up their effluent so that the threat of polluting the nearby stream has now been eliminated and thus their environmental footprint has been reduced. UltraZyme is a 100% environmentally friendly technology and was the ideal point-source solution to Blue Ribbon's problem.

UltraZyme is a unique product that utilizes enzymes to increase the rate of microorganism activity to significantly enhance the rate of degradation of any present organic contaminates while providing simultaneous odor control. UltraZyme is effective in a diverse number of applications such as wastewater treatment, oil & grease traps and interceptors, septic tanks, landfills, contaminated soil, aquaculture and a number of other agricultural and industrial related applications including waste lagoons. UltraZyme is equally effective in both aerobic and anaerobic environments, is 100% biodegradable and is applied using conventional spray equipment.

The main concern regarding agricultural run-off and effluents is the significant downstream effects produced once the contamination reaches various waterways including rivers, lakes and streams. The excess nutrient load from the manure, urine and other toxins brings with it a large bacteria population that is required to digest these nutrients. However the bacteria require oxygen to break down the effluent and thus use up the dissolved oxygen present in the water. This is referred to as BOD (biological oxygen demand), which is the amount of oxygen required by bacteria to consume the waste present in a specified volume of water. This phenomenon was the main concern at Blue Ribbon as the nearby waterways were experiencing numerous downstream effects due to the high levels of BOD.

In total a volume of 27,000 gallons (102,206 liters) of raw wastewater flows through Blue Ribbon's lagoons on a daily basis. And thus, the same amount flows through the drain field and into the stream causing the subsequent environmental impacts mentioned above. And despite such a large daily flow rate, only 1.5 gallons (5678 ml.) of UltraZyme have been used on a daily basis and the environmental concerns have been eliminated. The visual effect on the water has been remarkable, which combined with the laboratory results that have been achieved, are great barometers for the success of UltraZyme.

The laboratory results provided in Table 1 are proof of the dramatic improvements that UltraZyme can produce in a very short period of time. After only 10 days the BOD levels dropped over 25% which is already a dramatic result. In the same period of time there were also reductions in COD (chemical oxygen demand), suspended solids and fats, oils & grease by 20%, 25% and 24% respectively. However this was just during the first 10 days of treatment and these contamination levels continued to go down as treatment continued, showing vast improvements.

Blue Ribbon uses a separator followed by a series of four lagoons with a filter in between lagoon number three and four. UltraZyme is added to the effluent as it leaves the separator before it enters lagoon number one, at a rate of one gallon per day. A small dose of UltraZyme is also added in lagoon

Parameters	Expression	Method	Units	Original April 4	April 9	April 14	Limits
pH	U	4500 H B	U	8.44	8.90	9.08	5.5 - 9.0
Colour	Pt/Co	2120 - B	Pt/Co	Chocolate	Chocolate - Clear	Yellow - Greenish	No strong colour
Odour		2150 - B		Odour	Light - Floral	Light - Floral	No Perceivable Odour
Temperature	°C	2550 - B	°C	26°	26°	26°	N/A
Suspended Solids	s,s	2540 - D	mg/L	102	82	76	300
Chemical Oxygen Demand	COD	5210 - B	mg/L	216	192	172	700
Biological Oxygen Demand	BOD	5220 - D	mg/L	186	174	138	560
COD/BOD Relation	COD/BOD			1.16	1.10	1.25	1.25 - 2.50
Fats, Oils & Grease	FOG	5520 - D	mg/L	0.036	0.030	0.028	150

Table 1

number three, but to maximize the product's life-span (7 - 10 days) a re-circulating pipe was installed in lagoon four to allow some of the effluent to flow back into lagoon number 3 before exiting into the drainfield. The daily UltraZyme addition to lagoon number 3 is only one-half of a gallon. Both of these figures add up to the one and one-half gallons of UltraZyme that is used per day to treat an amazing 27,000 gallons of wastewater effluent.



Before



After

The other major problem that Blue Ribbon was plagued with was the horrible odor produced from the effluent it generated. The workers at the farm all previously had to work in very unpleasant conditions, not to mention the local residents of a nearby town who were burdened with the problem 365 days a year. The problem has now been solved because while UltraZyme reduces environmental contaminates such as BOD and COD, it provides simultaneous odor control. The Blue Ribbon factory is no longer seen as a nuisance by the surrounding community because of the foul odors it produces, but is now seen as a valuable member of the local economy.

It has now been well over a year since Blue Ribbon began using UltraZyme in April of 2005. The results have proven the product's efficacy on many levels including the visual results, reductions in environmental contamination levels and of course odor control. With the addition of UltraZyme, Blue Ribbon has also been able to stop using other toxic chemicals in their water clean up process such as flocculents, caustic solvents and other toxic materials. Due to UltraZyme's use Blue Ribbon no longer has to worry about its environmental impact far downstream and in their own community. However, the best reference regarding the benefits of the product can be extrapolated from the following statement made by a Blue Ribbon employee, "The water running out of the drainfield and into a nearby stream is so clean I've washed my hands in it and all that I noticed was a slight herbal smell."