

## Manure Lagoon Treatment

### Boen Boe Stud, Australia

#### Background

Boen Boe Stud is a pig farm located in Joadja, near Mittagong, in the NSW Southern Highlands, Australia. The farm has been in operation in its current state since 1976 and is managed by David McLeod, who has over 30 years experience in the industry.

The farming operation consists of conventional sheds with sows and weaners on straw. Boen Boe supplies approximately 5,000 head of stock per year to Pendle Ham & Bacon, a meat processing facility in the Sydney metropolitan area.

Boen Boe's pig waste management system consists of a series of dams fed by water tanks situated within the property.



*Wastewater Dam System including Anaerobic and Facultative Dams*

The farm sheds are washed down 4-5 days per week with bore water, supplied from a 1,000Gal (4,000L) tank located on the western side of the sheds.

Each shed contains a number of sub floor pits, which are flushed daily with water supplied from one of the property's 10 x 530Gal (2,000L) recycled water tanks. Wastewater is gravity fed through a solids screening system, flowing into a 265,000Gal (1ML) anaerobic dam and then into a 3,700,000Gal (14ML) facultative dam. Treated wastewater from the facultative dam supplies the property's recycled water tanks and is also used to irrigate pastures.

#### Manure & Odor Treatment Benefits

- Accelerates the decomposition of organic waste (sludge)
- Reduces the need for pump outs
- Removes rather than masks odors
- Reduces Biological Oxygen Demand (BOD) and Total Suspended Solids (TSS) by up to 80%
- Reduces fly numbers by removing organic attractants
- Improves nutrient availability if effluent is used to irrigate pasture
- 100% natural and non-toxic

#### Available Sizes

- 1kg/2.2lb
- 5kg/11lb
- 10kg/22lb



---

## Issues

The pig farming industry is often subjected to stringent operating regulations to ensure their impact on the environment is minimised. Pig farms produce large amounts of slurry and manure which if not managed correctly can lead to high odor, emissions and ground pollution levels. As part of the farm's management practices, wastewater samples are tested regularly to ensure they are in line with minimum requirements.

### Sludge build up in the anaerobic dam

Excessive sludge build up in the anaerobic dam had inhibited the flow, operation and capacity of the wastewater system. As sludge volume increases within the dam, resonance time (the time it takes for water to travel through the dam system) is slowly decreased. Any reduction in resonance times, affects the ability of incumbent microbial populations to effectively break down organic waste entering the dam. This situation causes an inflow, which is substantially higher in organic waste loads, into subsequent treatment dams. In turn, the efficiency of the entire wastewater treatment process is reduced. If left unattended, the dam will become ineffective and sludge will need to be excavated mechanically, or a new dam constructed as some jurisdictions prohibit the excavation and disposal of wastewater dam sludge. Excavating sludge mechanically has a number of environmental implications such as the type of machinery required and the manner in which the sludge is disposed. This particular method is also expensive and time intensive.

### High nutrient levels in the facultative dam

Treated effluent can be used to irrigate pastures set aside for mixed farming purposes. However, the disposal of effluent onto grazing land can present challenges if the water contains high nutrient loads.

Water quality tests taken from the facultative dam in June 2009 showed higher levels of nitrogen than previous tests. A higher nitrogen reading may potentially become an environmental issue for the stud and government authorities, as water from the facultative dam is used to irrigate pastures, where it may run off into nearby lakes or streams, or be absorbed into the water table and subsequently used as bore water.

### High nutrient levels in the water tanks

Water used to wash down the sheds is drawn from a bore and stored in a series of connected tanks with a total capacity of 1,300Gal (5,000L).

Bore water often contains higher than normal nutrient levels, making it susceptible to the formation of algae which can either become toxic or clog pumps and hinder cleaning processes.

Common methods used to remove algae involve chemical or mechanical treatment. David McLeod sought a natural remedy that would treat the underlying cause of the algae in an environmentally sustainable manner, and maintain the best possible conditions for stock.

## Solution

In July 2009, David McLeod approached CRT/Ruralco, a local agricultural supplier and authorised BiOWiSH Technologies stockist, for assistance in resolving the above issues.

CRT/Ruralco representative Ian Downey recommended *BiOWiSH™-Manure & Odor Treatment* as the solution.

*BiOWiSH™ Manure & Odor Treatment* is a powerful biocatalyst that breaks down organic waste and eliminates odor causing compounds at the source. *BiOWiSH™ Manure & Odor Treatment* is particularly effective for digesting sludge and odor from effluent ponds and lagoons.

For optimal results, Ian Downey established dosing regimes at each stage of the wastewater system.





*Above – Boen Boe Stud, In the Southern Highlands of NSW approx 1.5hrs from Sydney. Photo shows the swine farming operation including sheds, Anaerobic and Facultative Lagoons*

*“You can tell BiOWiSH™ is working to break down the sludge and organic waste. We have never seen activity like this in our dams before”. David McLeod, Manager, Boen Boe Stud*

## Manure & Odor Treatment (Swine & Poultry) Dosing Schedule

US		Anaerobic Lagoon 1				Facultative Lagoon 2			
Day	Date	Shock Dose Calc on Pond Vol 1ML		Daily Dose Cal on Daily Inflow <20KL		Initial Dose Pond Vol 14ML		Daily Dose Pond Vol 14ML	
		Dosing Amount	Qty of Water	Dosing Amount	Qty of Water	Dosing Amount	Qty of Water	Dosing Amount	Qty of Water
1	29/07/09	4.4lb	530USGal	14oz	1,000USGal	4.4lb	265USGal	N/A	N/A
2 - 6	-	-	-	3.5oz	1,000USGal	-	-	N/A	N/A
7	5/08/09	2.2lb	265USGal	3.5oz	1,000USGal	-	-	N/A	N/A
8 - 13	-	-	-	3.5oz	1,000USGal	-	-	N/A	N/A
14	12/08/09	2.2lb	265USGal	3.5oz	1,000USGal	-	-	N/A	N/A
15 - 20	-	-	-	3.5oz	1,000USGal	-	-	N/A	N/A
21	19/08/09	2.2lb	265USGal	3.5oz	1,000USGal	-	-	N/A	N/A
22 & Ongoing	-	-	-	3.5oz	1,000USGal	-	-	N/A	N/A

Metric		Anaerobic Lagoon 1				Facultative Lagoon 2			
Day	Date	Shock Dose Calc on Pond Vol 1ML		Daily Dose Cal on Daily Inflow <20KL		Initial Dose Pond Vol 14ML		Daily Dose Pond Vol 14ML	
		Dosing Amount	Qty of Water	Dosing Amount	Qty of Water	Dosing Amount	Qty of Water	Dosing Amount	Qty of Water
1	29/07/09	2kg 2mg/L	2,000L	400g 20mg/L	4,000L	2kg 0.14mg/L	1,000L	N/A	N/A
2 - 6	-	-	-	100g 5mg/L	4,000L	-	-	N/A	N/A
7	5/08/09	1kg 1mg/L	1,000L	100g 5mg/L	4,000L	-	-	N/A	N/A
8 - 13	-	-	-	100g 5mg/L	4,000L	-	-	N/A	N/A
14	12/08/09	1kg 1mg/L	1,000L	100g 5mg/L	4,000L	-	-	N/A	N/A
15 - 20	-	-	-	100g 5mg/L	4,000L	-	-	N/A	N/A
21	19/08/09	1kg 1mg/L	1,000L	100g 5mg/L	4,000L	-	-	N/A	N/A
22 & Ongoing	-	-	-	100g 5mg/L	4,000L	-	-	N/A	N/A

**Number of sows (hogs):**  
**Daily cost per sow:**

**300**  
**AUD\$0.03**

*N.B Each of the 10 x 2000L Recycled Water Sump wash tanks was given a single application only of 100g of Manure & Odor Treatment (Swine & Poultry) mixed into 20L of water.*

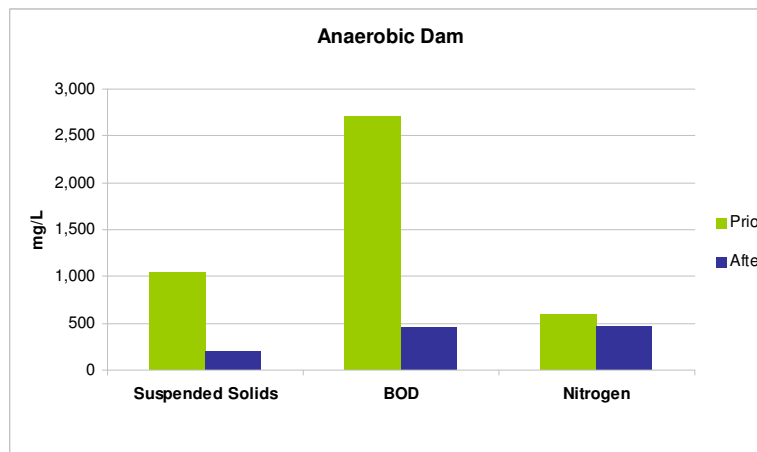
Biological Help for the Human Race™

## Preliminary Outcomes

### Anaerobic Dam

BiOWiSH™-Manure & Odor Treatment reduced the strength of effluent water in the Anaerobic dam by 83%.

	Prior to Treatment 20 July 2009	After Treatment 10 September 2009	% Reduction
Total Suspended Solids (mg/L)	1,050	200	81%
BOD (mg/L)	2,700	450	83%
Nitrogen (mg/L)	590	470	20%



*Prior to application of BiOWiSH™ – Little or no sign of activity within the dam. High BOD, TSS and Total Sludge Content.*

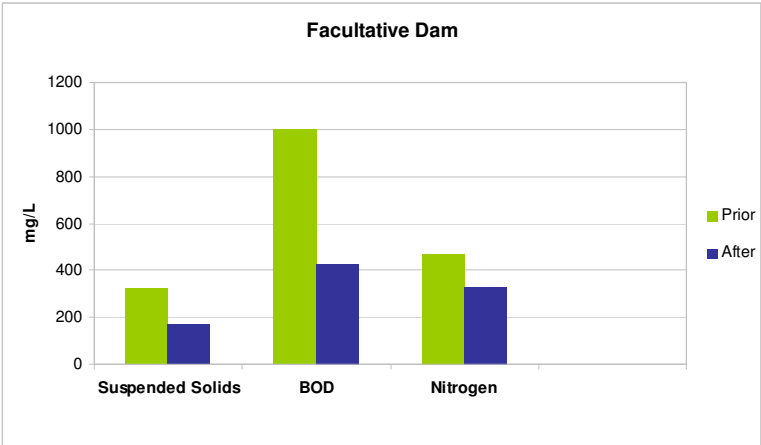


*Following application of BiOWiSH™ – Very noticeable bubbling and sludge reactivation, causing slick on dam surface. Substantially lower BOD, TSS and Sludge Content. This will continue until sludge has been completely degraded.*

Facultative Dam

BiOWiSH™-Manure & Odor Treatment reduced the strength of waster water in the facultative dam by 57%.

	Prior to Treatment 20 July 2009	After Treatment 10 September 2009	% Reduction
Total Suspended Solids (mg/L)	320	170	47%
BOD (mg/L)	1,000	430	57%
Nitrogen (mg/L)	470	330	30%



Facultative Dam



## Wash Down Water

A visible reduction in algae was observed.

Green algae (as seen below) covered close to the entire water surface, supported by the higher than average nutrient levels in the water drawn from a bore or well.

BiOWiSH™ rapidly degrades organic waste and nutrients. Within 3 days of *BiOWiSH™-Manure & Odor Treatment* being applied, water in the tanks had changed from being the ideal environment for algae to thrive, to being a clean, clear body of water with minimal algal growth.

3.5oz (100gm) of *BiOWiSH™-Manure & Odor Treatment* is added daily to the inlet of the freshwater tank to maintain water quality. It will also help continue to degrade the sludge and nutrient in the anaerobic and facultative dams as water stored in the tanks is used to wash down farm floors and pens.



*1,300Gal (5,000L) fresh water tank, prior to the application of BiOWiSH™, showing inlet (far left, with float / ball valve) and linked sections, all with moderate to severe algal growth on the surface of the water.*



*Following the application of BiOWiSH™, the high nutrient levels have been reduced to the point where algal growth is inhibited. The fresh water used for washing down is now clean and clear, with very little algae.*

---

## Summary of preliminary results

- Substantial reduction in Total Suspended Solids and BOD within both the Anaerobic and Facultative dams
- Significant decrease in nutrient load of wastewater, within the water reticulation system
- Significant decrease in nutrient load of water used to irrigate pastures
- Improved quality of wash down water – no algae growth
- Noticeable improvement in cleanliness and sanitary levels of shed wash down areas

*“We are very happy with how things are progressing. BiOWiSH™ is easy to apply and has achieved more than we expected in such short a time. We’re looking forward to seeing further improvements in water quality and reductions in odour over the next few months”. David McLeod, Manager*

## Final Results

Final results will be made available in the near future. Further significant reductions in nutrient loads, suspended solids and volatile organic compounds are anticipated.

## About BiOWiSH™ Manure & Odor Treatment

The result of over 18 years of research and development, BiOWiSH™ is a powerful blend of biocatalysts that breaks down complex organic molecules to help eliminate waste, reduce odors, improve soil fertility and enhance water quality, among other uses. 100% natural and non-toxic, BiOWiSH™ is safe for everyday use in a wide range of consumer and industrial products. It has been proven to solve problems in environmental management (including wastewater, solid waste, soil and water remediation and industrial emissions), as well as agriculture. BiOWiSH™ products are used extensively and available in Asia, Australia, Europe, North America and Latin America.

Developed specially for the Animal Agriculture industry, *BiOWiSH™ Manure & Odor Treatment* is a revolutionary product that rapidly removes ammonia and odorous emissions, breaks down organic waste and accelerates manure composting.

## Contact Information

### BiOWiSH Technologies

Tel: +1 312 572 6700

Email: [agronomy@biowishtech.com](mailto:agronomy@biowishtech.com)

Web: [www.biowishtech.com](http://www.biowishtech.com)

Biological help for the human race



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

BiOWiSH™ is a registered trademark of BiOWiSH Technologies Inc.

CSWT05MA11US

Biological Help for the Human Race™