



*The Removal & Elimination  
Of  
Phosphate & Nitrates  
In  
Swine Waste Lagoons*

Field Test Results Dated: 6/4/11

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DO2E Waste Water Treatment LLC & Dr. J H Wakefield have combined their vast years of knowledge and experience in municipal and industrial waste water treatment and processing to help solve the phosphate and nitrate problem in animal waste disposal for commercial farming operations. With over 50 years of combine knowledge and experience in wastewater treatment, processing and monitoring, Mr. Randy McGuffin, owner and founder of DO2E Waste Water Treatment and Dr. J H Wakefield have collectively designed an Economically Viable and Environmentally Friendly Solution to the commercial animal waste disposal problems.

Our state of the art “Closed Loop” design, Eliminates the Two Main Problems that exist in commercial animal waste disposal, related to “Lagoons” and “Spray Fields”.

While this White Paper Report focuses on the Swine industry, our, “Closed Loop Process” can be applied to any commercial farming operation where animal waste problems exist. (Dairy, poultry, swine, fish, alligator etc....)

Mr. McGuffin holds multiple patents on state of the art wastewater treatment equipment that have been tested and proven as evidence in the recent tests results listed below.

The following results were achieved in North Carolina, at a Commercial Swine Finishing Farm. This operation housed over 6,000 head of hogs. The tests were conducted in May 2011 with the following astounding results.

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System TSS T-PO4 TKN

Influent 2050 mg/L 879 mg/L 3210 mg/L

Effluent 380 mg/L

21.3 mg/L 1210 mg/L

% Removal 81.5%

97.6% 62.3%

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Concentrated Manure Solids = 28%

TKN = 550mg/kg T-PO4 = 3070mg/kg Total Solids = 28%



Before (Influent)

During

After (Effluent)

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DO2E Waste Water Treatment has developed and patented the equipment required to eliminate or mitigate many environmental issues associated with the currently approved methods for the disposal of animal waste associated with confined animal feeding operations. (CAFO)

Mr. McGuffin is committed to designing and developing economically viable and environmentally friendly solutions and equipment to help solve the worlds waste water problems. Our goal is to help clean up our environment.

Some of the Direct Benefits & Results of our advanced technology for animal waste removal are:

- 1) Eliminates the use of Lagoons for storage of animal waste
- 2) Eliminates use of Spray Fields for the dispersal of excess waste water
- 3) Reduces Disease among Animals and Humans
- 4) Reduces the potential for drinking water contamination due to run off
- 5) Reduced Animal mortality by improving environmental conditions
- 6) Produces Accelerated Growth Rates among Animals
- 7) Reduces Odor Issues
- 8) Reduces Toxic Run Off Potential from lagoons
- 9) Produces Production Premiums for Healthy Animal Production
- 10) Reduces Water Consumption (Recycled / Reclaimed Water)
- 11) Reduces Labor Cost
- 12) Reduces Building Maintenance Cost
- 13) Reduces Ammonia Build up
- 14) Increase in Profitability

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- 15) Reduces Growing Time
- 16) Allows for Removal of Moratorium to increase number of animals for
- 17) Reduces Fertilizer Cost
- 18) Reduces Usage of Harmful Man Made Fertilizers and Chemicals
- 19) Creates Jobs
- 20) Promotes Positive Views for Commercial Animal Production
- 21) Low Operational & Maintenance cost

**\*Waste Management and Public Health Concerns**

Contaminants from animal wastes can enter the environment through pathways such as through leakage of poorly constructed manure lagoons or during major precipitation events resulting in either overflow of lagoons and runoff from recent applications of waste to farm fields, or atmospheric deposition followed by dry or wet fallout. Runoff can leach through permeable soils to vulnerable aquifers that tap ground water sources for human consumption. Runoff of manure can also find its way into surface water such as lakes, streams, and ponds.

Many contaminants are present in livestock wastes, including nutrients, pathogens, veterinary pharmaceuticals and naturally excreted hormones. Improper disposal of animal carcasses and abandoned livestock facilities can also contribute to water quality problems in surrounding areas of CAFOs. (Confined Animal Feeding Operations)

Exposure to waterborne contaminants can result from both recreational use of affected surface water and from ingestion of drinking water derived from either contaminated surface water or ground water.

High-Risk populations are generally the very young, the elderly, pregnant women, and immunocompromised individuals. Dermal contact may cause skin, eye, or ear infections. Drinking water exposures to pathogens could occur.

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\*This swine production and pollution that accompanies factory hogging is concentrated in the parts of North Carolina that have the highest disease rates, the least access to medical care, and the greatest need for positive education and economic development.<sup>[19]</sup> Since hog production has become consolidated in the coastal region of N.C., the high water tables and low-lying flood plains have increased the risk and impact of hog farm pollution. A swine CAFO is made up of three parts: the hog house, the “lagoon,” and the “spray field.” Waste disposal techniques used by small-scale traditional hog farms, like using waste as fertilizer for commercially viable crops, were adopted and expanded for use by CAFOs. Lagoons are supposed to be protected with an impermeable liner, but some do not work properly. This can cause environmental damage, as seen in 1995 when a lagoon burst in North Carolina. This lagoon released 25 million gallons of noxious sludge into North Carolina’s New River and killed approximately eight to ten million fish.<sup>[20]</sup>

The toxins emitted by the swine CAFOs can produce a variety of symptoms and illnesses ranging from respiratory disorders, headaches, and shortness of breath to hydrogen sulfide poisoning, bronchitis, and asthma. The potential for spray field runoff or lagoon leakage puts nearby residents in danger of contaminated drinking water, which can lead to diseases like salmonellosis, giardiasis, Chlamydia, meningitis, cryptosporidiosis, worms, and influenza.

We would like to personally thank the following participants who helped make this vital program a success.

Mr. Robert Eugene Ward

NC State University

Smithfield Farms

Murphy Brown LLC

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References: \*Intensive Pig Farming

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