



BEST PRACTICE SLUDGE MANAGEMENT

SLUDGE HANDLING AND MANAGEMENT

Project Participants

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Problem

Sludge removal from waste management ponds is a pressing issue for many piggeries. The sludge is a mix of water and solids; total solids are made up of organic and inorganic materials which vary in size and cohesiveness. This creates challenges for pumping or mechanically removing the waste. Covered anaerobic ponds used to produce biogas present special problems for sludge removal as the covers must be left in place.

Project

This study reviewed the physical properties and behaviours of sludge in different types of waste management ponds in order to establish recommendations for the most effective frequency and methods of sludge removal. Samples were collected from ponds at several Australian piggeries and analysed to determine options for pumping, removing, dewatering and managing waste sludge.

Value for Producers

Optimising sludge removal will help producers minimise the expense of maintaining waste management ponds. It will also help with the management of biogas production systems.

Recommendations

Resistance to pumping increases with the proportion of total solids but decreases with temperature. As a result, removing the water and digging out the sludge with earthmoving equipment is often cheaper for ponds containing very old or thick sludge.

The best method for desludging will depend on the operation and structure of the pond, the frequency of desludging and the physical characteristics of the sludge. Particle size distribution, density and the ability of the sludge to be pumped (its rheological properties) are all important considerations.

Sludge management in covered anaerobic ponds being used for biogas production requires a different approach as the cover cannot be removed during operation. Sludge may be removed by pumping or by keeping the solids in suspension through agitation so they are removed as part of the effluent flow from the pond. Alternatively, sludge can be left to settle and accumulate over the operating life of the pond.

Sludge containing 3 per cent solids was easily pumped, but pipe friction rapidly decreased as solids approached levels of 10 per cent, making the material very difficult to pump.

This suggests frequent pumping of recently settled sludge from a covered pond is more effective than infrequent pumping of densely settled sludge with a solids content beyond 10 per cent.

More Information

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