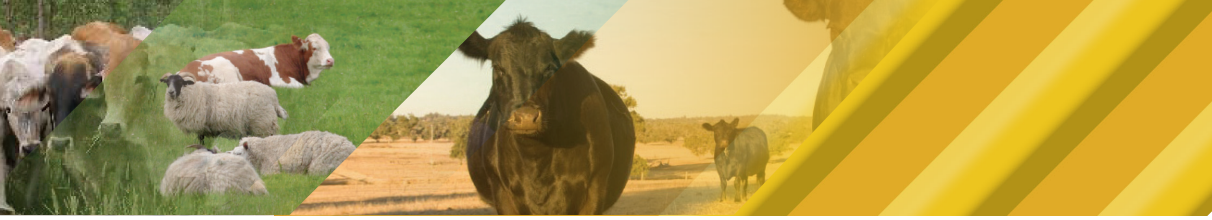

AUSTRALIAN MEAT PROCESSOR CORPORATION

AMPC AND INDUSTRY WORKING TOGETHER TO CAPTURE ENERGY FROM WASTEWATER

IGLOO POND COVERS:
Covered Anaerobic Ponds Using HPDE Pipe and Sheet in the Meat Industry

NOVEL POND COVERS: CHURCHILL

AMPC and MLA are partnering with Churchill abattoir in Queensland to investigate a novel design approach to the capture of methane from anaerobic lagoons.

CHALLENGES FACED WHEN COVERING ANAEROBIC PONDS

Conventional pond covers able to collect methane and reduce odour from large anaerobic ponds are expensive and present a range of operational and maintenance challenges. Some of these issues include the reaction of the cover material to fats, oils, and greases (FOG), the differential settling of the pond cover after rain, the need to pump water off the cover, the application of gas collection mechanisms, and the practicality of cover removal and repair.

The critical issues for pond covers are identified to be shape preservation, pond cover design, where the cover should not come into contact with the pond and should cover the entire pond, the easy removal of the cover, the avoidance of collecting pond water on its surface and the need for a single gas collection point. There are a number of different designs considered to overcome these issues, including covers supported by ropes, Greenhouse or 'Quonset Hut' designs, and conventional clear span structures. The considerations when choosing a design include cost, materials, strength and versatility.

A NEW APPROACH

The Churchill project is trialling a modular approach using a series of smaller ponds (rather than a single large pond) and investigating innovative removable pond cover designs. Several raft structures using PVC and HDPE pipe have now been trialled for ease of construction, cost, and structural integrity. As part of the trial, two cover materials, HDPE sheet and a rubber impregnated Geofabric, were assessed. The trials demonstrated that the HPDE pipe and sheet were the most effective, compared with the Geofabric option.

The final design involved a raft comprising 50 x 20 x 1.8m HDPE welded pipe forming an external frame, horizontal spacers, and bows across the short side. The frame was covered with a 2 mm HDPE sheet that was welded to the outside frame. The pipe welding was undertaken by processing plant staff trained in HDPE welding and the HDPE sheet was locally fitted. The approximate cost was 50% of conventional buried covers (ie buried along the outside boundary of the pond). The raft was relatively manoeuvrable, maintained its structural integrity, provided stability in high winds and a high degree of flexibility. The raft could also be removed and re-used without major work, and worked effectively to capture gas.

WHERE TO FROM HERE?

Issues that require further examination include developing the raft to cover the entire surface of the pond, improving the effectiveness of reducing odour, and assessing the wind resistance and stability. The next stage for the project will involve assessing the cost and effectiveness of smaller, 'pod' type rafts for larger ponds. Start up and operational performance of the Churchill ponds is being monitored by the National Centre for Engineering in Agriculture (NCEA) at the University of Southern Queensland.

The Churchill project forms part of a broader AMPC/MLA strategy to develop system design criteria and monitor the performance of a number of anaerobic ponds at sites around Australia to inform the development of a Knowledge Centre for Wastewater Management for red meat processors.

AMPC and MLA would like to thank Mike Spence, Engineer, Churchill Abattoir Pty Ltd for his support and collaboration on this key industry project.

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