TECHNICAL FACTSHEET 3 –
DAIRY EFFLUENT MANAGEMENT

SYNTHETIC-LINED EFFLUENT PONDS

STANDARD 4 IN THE CODE OF PRACTICE FOR DAIRY FARM EFFLUENT MANAGEMENT WA: STORAGE OF EFFLUENT

Storage of dairy effluent is a key component of an effective effluent management system. Storage allows effluent to be stored when soils are saturated and application is unsuitable, reducing nutrient loss to surface and ground water. It also allows the strategic application of effluent to pastures or crops when nutrients can be better utilised.

Dairy effluent is commonly stored in effluent ponds but there are also alternatives including above-ground tanks and bladders. The capacity and lining of storage ponds must be designed to prevent overflow as well as leaching into groundwater. For clay-lined ponds to contain effluent, there are strict construction requirements. The clay must meet permeability requirements that is determined by soil analysis. The clay must also be compacted and applied at the appropriate thickness during pond construction.

A synthetic liner can represent the best value in the scenario where no suitable clay is available on site and the cost of importing clay or bentonite is cost prohibitive. Synthetic liners also provide a higher level of impermeability compared to clay liners. This may provide more control and certainty should future regulation require new ponds to be synthetically lined.

Another attractive feature is the ease at which synthetic-lined ponds can be covered, allowing the capture of methane for electricity production.

There are a range of synthetic lining materials available, but effluent ponds are usually constructed with High Density Polyethylene (HDPE). This product can range in thickness from 0.8mm to 3mm and the thickness is a compromise between durability and flexibility. The liner must have permeability of ≤0.1 mm/day and be installed to the manufacturer's specifications. Seepage losses are usually associated with the joining of membranes, so care must be taken with overlapping and welding of liners. This is usually the role of a contractor, so using a recognised supplier with a good construction record is recommended. Protecting damage to the liner is important for both clay and synthetics.

For desludging, the use of an agitator and pump is preferred. If an excavator must be used, then used tyres or some other barrier should be installed across the liner during installation.

Synthetic liners must be installed at least one metre above the highest water table, which can put upward pressure on the liner and cause damage. Gas drainage is also recommended where there is any risk of gas production beneath the liner which can cause the liner to lift and form 'whales'.

GOVERNMENT OF WESTERN AUSTRALIA

Department of **Water and Environmental Regulation**

Department of **Primary Industries and Regional Development**

HEALTHY ESTUARIES WA

This project is a part of Healthy Estuaries WA – a State Government Royalties for Regions program that aims to improve the health of our South West estuaries.

CASE STUDY: LACTANZ 1, SCOTT RIVER
First Australian Farmland Pty Ltd
Herd Size: 1,000 cows
Farm Size: 320ha irrigated, 120ha dryland
Shed type: 60-stand rotary

System details

The milking platform and pit are hose-washed with fresh water and the main holding yard is flood washed using recycled water. All effluent is collected in a sand trap and associated sump. From the sump the effluent is pumped to a synthetic lined (1.5mm HDPE) two-pond treatment and storage system constructed on a nearby sandy ridge above the water table. These ponds were constructed in 2021 and the effluent will be used to irrigate dryland paddocks on the farm. There is also the option to apply the effluent through centre pivot irrigation.

Primary solids sedimentation pond with T-piece transfer system.

What's working well?

While still in the early stages, the synthetic liner is working well and containing all effluent. It has overcome the storage challenges in this environment which has high rainfall, sandy soils and a high water table.

"We put the synthetic liner in here as there's no clay. It's the only way to hold the effluent."

JAY WYND, FARM MANAGER

Secondary liquid effluent storage pond.

Recently flood-washed yard at Lactanz 1.

This recommended management practice/ technology meets Standard 4 in the **Code of Practice for Dairy Farm Effluent Management WA: Storage of Effluent.**

Further information

Synthetic pond liners are ranked as a viable management practice in WA. This feasibility ranking is based on best available knowledge and considers ease of management, cost, availability, maintenance, integration and likelihood of success (Price & Tait 2019).

Visit **westerndairy.com.au** to view a list of all viable management practices and technologies in WA.

Contact: Dan Parnell, Western Dairy regional extension officer.

E: dan.parnell@westerndairy.com.au

M: 0467 556 542

Dairy Australia Limited ABN 60 105 227 987
E enquiries@dairyaustralia.com.au
T +61 3 9694 3777
F +61 3 9694 3701
dairyaustralia.com.au

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