

EFFLUENT SOLIDS SEPARATION SYSTEMS

STANDARD 2 IN THE CODE OF PRACTICE FOR DAIRY FARM EFFLUENT MANAGEMENT WA: SOLIDS MANAGEMENT

Separating solids from effluent enables effective handling and greater reuse options for both liquids and solids.

When solids have been removed effectively, liquid effluent is more reliably pumped through pressurised application systems, and solids material is drier and easier to spread. There are many solids separation systems, and more than one option can be used at a time.

Passive Systems

Trafficable Solids Traps – Use a weeping wall or T-piece to separate solids. Design is critical to performance. Loose solids need to be removed on a regular basis and contained for drying before spreading.

Primary sedimentation, anaerobic ponds – Low cost and low day-to-day maintenance. Removing solids with an excavator can prove difficult and solids need to be dried and spread. Slurry tanker cleaning is preferred and can be undertaken by contractors.

Solids Ditch (or SEPS) – Low cost and low maintenance. These are shallow, narrow ditches and solids can be

cleaned with an excavator. Multiple ditches allow the effluent to divert to allow the others to dry out. Usually has a high land use footprint and creates larger rainfall catchment.

Mechanical Systems

Screw Press – Screw press separators use a straight or tapered screw (auger) to compress solids within a perforated or slotted cylinder. Liquid is forced out through the screen openings by pump pressure and the rotating screw. Needs a gantry and solids bunker. High capital and running costs. High quality dry cake. Best suited to effluent with high solids.

Slope Screens – Effluent passes over a static or vibrating screen which filters solids. Lower capital cost but also requires gantry and solids bunker. Can be integrated with a roller press.

Z-Filter – High capital cost. High quality dry cake. Has been used successfully with flocculants to reduce phosphorus from the liquid effluent. Best suited to effluent with high solids.

Table 1 Ratings for solids system performance (costs assume clay-lined ponds and ditches)

Effluent application system	Low capital cost	Routine management (labour)	Repairs and maintenance	Solids quality
TST	★★	★★★★	★★★★★★	★★
Sedimentation or anaerobic ponds	★★★★★	★★★★★	★★★★★★	★
Solids ditch	★★★★★★	★★★	★★★★★★	★★★
Screw press	★★	★★★	★★	★★★★
Slope screen	★★★★	★★★	★★★	★★★★
Z-Filter	★	★★★	★★	★★★★



Department of Water and Environmental Regulation
Department of Primary Industries and Regional Development



**CASE STUDY: BOLEY FAMILY,
SCOTT RIVER, WA**

Herd Size: 1,500 cows

Farm Size: 1,100ha

Shed type: 80-stand rotary

System details

The milking platform and pit are hose-washed with fresh water and the main holding yard is flood-washed twice daily. A solids separation system has now been installed called the Z-Filter which produces a dry cake suitable for composting and a high-quality liquid which is applied to 77 hectares of centre pivot irrigated pasture. Previously, the effluent was caught in a trafficable solids trap and stored in ponds before being applied to eight hectares via solid set sprinklers.



Z-filter solids separation machine.

What's working well?

The solids cake is very dry and easy to handle. The liquid has sufficient quality to apply through the mainline of the centre pivot irrigation.

"The liquid effluent is very clear with no particles in it, and it goes through the nozzles without any trouble. It saves us 25% of our fertiliser bill."

BRAD BOLEY



Slope screen and roller.



This recommended management practice/technology meets Standard 2 in the **Code of Practice for Dairy Farm Effluent WA: Solids Management.**

Further information

Z-Filter solids separation is 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.

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