

FACT SHEET



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Clean and Dirty Water Management: Case Studies



Introduction

Over the past 18 months, three Farming Connect demonstration farms have looked at different options to reduce pollution risk and the volume of dirty yard run off. The three farms have found that simple, cost effective changes can make a significant difference to minimise pollution risk.

All farms need to comply with the Water Resources (Control of Pollution) (Silage, Slurry and Agricultural Fuel Oil) (Wales) Regulations 2010¹, known as “SSAFO Wales Regulations”. The SSAFO regulations, enforced by Natural Resources Wales, are the regulatory standards for storing silage, slurries² and agricultural fuel oil. The aim of regulations is to minimise the risk of causing water pollution. The definition of slurry under the SSAFO regulations includes runoff from dirty yard areas.

¹ SSAFO guidance can be found on the Welsh Government website: www.cymru.gov.uk

² ‘Slurry’ is defined in Regulation 2(1) of the SSAFO Wales Regulations as ‘liquid or semi-liquid matter composed of excreta produced by livestock while in a yard or building (including that held in woodchip corrals); or a mixture wholly or mainly consisting of livestock excreta, livestock bedding, rainwater and washings from a building or yard used by livestock, and of a consistency that allows it to be pumped or discharged by gravity at any stage in the handling process.’



New rainwater guttering and down pipes installed at Great House Farm

Reducing dirty water production at Great House Farm

Great House demonstration farm, Llansoy, Monmouthshire consists of around 270 acres of owned and rented land which runs 30 suckler cows of various crossbreeds and 400 ewes. Calves are purchased to rear as suckler replacements annually.

Infrastructure advice through Farming Connect has helped to adapt a traditional farming system in line with current regulations. Recommendations offer cost effective ideas, making it easier to manage slurry and dirty water, and reduce the risk of causing water pollution.

A survey of Great House farm found a large proportion of the slurry produced was made up of contaminated rainwater. Mr Williams was initially considering installing a new slurry lagoon to collect all slurry/dirty water produced. The Farming Connect Infrastructure report highlighted that making small changes by diverting rainwater away from dirty yard areas would make a big reduction in slurry volume.

Improvements to the buildings layout allowed Mr Williams to feed and house stock under cover. This enabled the farm to move to a straw bedded manure system negating the need for a slurry store. Mr Williams found that diverting the clean rainwater, prior to contamination and not having livestock on external yards prevented the production of dirty water. An investment of £1,200 was made on rainwater guttering, downpipes and a rainwater harvesting tank.

The small 250m² roof currently produces 160m³ of dirty water over the four months winter period. This equates to 35,200 gallons or 18 tanker loads needing to be spread over the winter.

Intercepting the roof water and diverting to a clean drain saves the farmer costs on diesel, labour, machinery wear and tear and additional slurry storage.

Also reduces damage to the land (sward and soil) and the risk of polluting rivers by not having to spread in unfavourable weather conditions.

These clean and dirty water separation improvement works have cut costs and reduced the risk of causing pollution by:

- eliminating dirty yard areas by feeding and housing stock under cover;
- reduced labour costs by negating the need to scrape external yards;
- ensuring only clean water is discharged to the river via new guttering and drains;
- saving the costs of constructing a new slurry store.

Improved collection of dairy and parlour washings at Cerrigcaranau

The Jenkins family milk 125 cows, run a pedigree herd of Welsh black cattle and 450 ewes at Cerrigcaranau, which is situated along the Dovey catchment.

They have recently invested in improving cow accommodation and slurry storage within the dairy unit, building a new cubicle shed with a slatted slurry store beneath.

Although installing a slurry tank below the cubicle building was comparatively expensive when compared to an external earth banked lagoon, Mr Jenkins looked at the installation as a long-term investment. An external storage facility would collect surface rainfall. At Cerrigcaranau this could equate to as much as 800mm (2ft 8") of extra water collected over the surface area of the slurry store. After considering the added costs of collecting and disposing of the surface rainfall, plus the extra capacity needed for the facility, it was decided to construct a shuttered concrete slurry store beneath the new cubicle building.

The new building with the covered store beneath was also designed and planned to ensure dirty water volumes were kept to a minimum. This reduced the required storage capacity and reduced dilution of the nutrients helping reduce overall fertiliser costs.

Collection of parlour washings at Cerrigcaranau was causing concern. Parlour washings were mixing with yard runoff and entering the clean drainage system. Mr Jenkins was advised to channel all parlour washings to a new collecting tank thereby removing the polluting milk washings from entering the clean water drain. The fact that no surface rainfall is collected in the slurry store meant that extra capacity was available to contain the parlour washings.

The separation of the parlour washings from the yard runoff will allow clean water to continue to be disposed of via the ditch whilst all parlour washings will be collected.

Dairy parlour washings are classified as 'slurry under The Water Resources (Control of Pollution) Silage, Slurry and Agricultural Fuel Oil (Wales) Regulations 2010 (SSFAO) and need to be collected, contained and disposed of in a controlled manner. At Cerrigcaranau farm, Mr Jenkins was advised to install a new parlour washing collection tank. Under normal operations the parlour washings are applied to the land by vacuum tanker. If weather conditions are poor and unsuitable for spreading, then the parlour washings are transferred from the tank to the slurry store by a float switch pump.

These clean and dirty water separation improvement works have reduced the risk of causing pollution by:

- separating and collecting all parlour washings;
- ensuring only clean water is discharged to the river;
- reduced the risk of causing pollution by spreading during poor weather conditions.

Reduce pollution risk of silage effluent at Stember Farm

William Jenkins and his family milk around 180 cows at Stember Farm, Poyston Cross, Haverfordwest. They have been engaged in a programme of infrastructure improvements throughout the farm complex.

The older farm buildings are located at the upper yard level. All slurry and dirty water produced by the youngstock housed in these buildings is collected in a pre-1991 earth banked slurry lagoon. Although this is classed as a SSAFO exempt structure due to its age, regular maintenance is still required to ensure it does not pose a pollution risk. Mr Jenkins ensures the facility always maintains a 750mm freeboard and regularly monitors the lagoon during wet weather periods.

Improvement works have already been carried out to the concrete yard areas to ensure clean and dirty yards are kept separate. This has been achieved using concrete sleeping policemen to stop clean yard water becoming contaminated by seeping on to dirty yards. All clean water is diverted to the clean yard whilst all dirty runoff is collected in the slurry storage system. The improvements form part of the on-going pollution prevention works at Stember.

As part of these works, the lack of control of effluent runoff from main silage clamps is also being addressed. Silage effluent is highly polluting and must be contained in accordance with SSAFO regulations. Mr Jenkins has opted to install a new SSAFO compliant storage tank and effluent collection channel adjacent to the clamp. This is a pre 1991 clamp and therefore SSAFO exempt (see overleaf for details). By installing the interception channel at the face of the clamp, the amount of contaminated runoff is kept to a minimum.

Mr Jenkins was keen to improve the effluent control around the silage clamps by installing a new SSAFO compliant effluent tank. The current SSAFO regulations state that the collection channels should lead to a tank that is able to resist acid.

The storage capacity of the new tank is determined by the volume of the silos. The new effluent tanks should be able to hold at least 20 litres of effluent for each cubic metre (m^3) of silo space, if the silo holds less than $1,500m^3$. Silos with a capacity of more than $1,500m^3$ should have an effluent tank of no less than $30m^3$ plus 6.7 litres for each m^3 of silo capacity in excess of $1,500m^3$. If the base of the tank is below ground, the tank should be able to resist acid attack for 20 years without maintenance.

The installation of the new silage effluent tank and channel has:

- reduced the pollution risk to groundwater and nearby watercourses
- prevented contamination of clean yard areas in front of the clamps;
- ensured compliance with the SSAFO regulations.

Silage clamp/silo exempt status under SSAFO regulations

The SSAFO regulations requires that there must be a perimeter channel to collect any silage effluent that may escape the silo. However the silage clamp at Stember does not have a perimeter silage effluent collection channel and this is deemed acceptable under the following provision.

The silage clamp at Stember was constructed before March 1991, and is considered as an “exempt” structure, and therefore does not have to comply with the SSAFO regulations for the following reasons:

In accordance with the SSAFO regulations, installations such as slurry stores and silage clamps, that were in use or built before March 1991, or where a contract for construction was entered into before March 1991 and completed before September 1991 are deemed as “exempt” structures and do not have to comply with the SSAFO regulations. The exempt status can be lost if the installation gives rise to pollution or undergoes a “substantial change”. In the case of Stember, the installation of the interception channel to direct silage liquor to the collection tank, thereby reducing the risk of causing pollution, is not deemed a “substantial change” and the “exempt” status of the silage clamp remains in place.

Further guidance on “exempt” status can be found on the Welsh Government website or in The Water Resources (Control of Pollution) (Silage, Slurry and Agricultural Fuel Oil) (Wales) Regulations 2010- Guidance Notes for Farmers (English).

For new silage storage facilities there is a legal requirement to notify NRW 14 days prior to use.

Summary

Reducing the amount of rainfall entering the slurry/dirty water system is crucial to minimise costs. Savings can be made in:

- size and cost of new storage facilities;
- labour;
- cost of spreading/application to land;
- better nutrient value of slurry, thus reducing fertiliser costs;
- wear and tear of machinery;
- damage to land by spreading in unsuitable conditions.

Importantly cost effective improvements of the facilities on the farm will reduce the pollution risk, help regulatory compliance and give peace of mind.

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