Supporting guidance for Rural Sustainable Drainage Systems – Pond

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For recent changes to this guidance, please see the bottom of the page .

Ponds are permanent water features designed to hold run-off long enough for self-purification processes to clean up low levels of pollution.

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Benefits

Ponds can reduce pollution risk by slowing down run-off, allowing pollutants to filter or settle out and be taken up by plants and / or broken down in the soil.

In relation to steadings, ponds are useful for accepting and treating run-off from clean yard areas as part of a treatment train approach, where the pond accepts run-off from another feature such as a sediment trap and / or swale. They are not appropriate for accepting more polluted types of run-off such as slurry.

Ponds can also be used in-field to help manage soil erosion risks.

> ***Using a combination of rural sustainable drainage systems will be more effective than individual measures – the treatment train approach.***

What needs to be done?

Drainage from a steading

Where it is proposed that the pond will take drainage from a steading the first step should be to carry out a diffuse pollution steading assessment.

The principle of this is to illustrate which parts of the yard areas will be suitable to be discharged to the pond and to assess the current diffuse pollution risk.

See Annex: Identifying run-off types.

It is important that the assessment clearly identifies where the run-off originates from where it currently discharges to and how it currently gets there.

Where a new Rural SuDS or surface water drainage system is to be created it is important to ensure that these are not located within 10 meters of any slurry store, effluent tank, silage clamp or silage bale storage area.

It is important to note that steading areas which produce slurry, silage effluent or that are contaminated with slurry/ silage effluent must not be conveyed to a pond.

See attached annex for information on identifying different drainage types.

For concrete yards/ tracks and farms buildings constructed after 1 April 2007 there is a statutory requirement (Controlled Activities Regulations GBR10) that any water runoff should be discharged via a Sustainable Urban Drainage System (SUD).

This excludes areas draining to a silage tank or slurry store.

Therefore applications for any RSuDS options may be considered as ineligible for cases where the entire farm steading or new buildings adjacent to the original steading have been built since 1 April 2007 without the benefit of any associated SUD.

Similarly, where a large proportion of the original steading has been redeveloped since 1 April 2007 it may be considered ineligible.

If the redevelopment does not involve significant changes to the surface water drainage system and/ or increasing the amount of runoff discharging to a water course then the case may well be eligible. Cases involving substantial changes to surface water drainage etc. with no associated RSuDS are likely to be ineligible.

Field run-off

For arable situations, the principle aim of the pond will be to collect overland run-off to allow sediment to drop out. In grassland situations the purpose may be to capture run-off from a track or road used by livestock or machinery and to discharge it to grassland away from watercourses.

For in-field ponds it will be necessary to carry out a simple diffuse pollution risk assessment to identify which fields are at risk of erosion and where the pond should be created.

Using a map, such as a copy of the IACS map, identify all watercourses on the farm or area of land in question.

The next step is to consider where the potential for soil erosion is greatest and where this can pose a risk to the water environment.

This assessment should consider the following:

- proximity to nearby watercourses – the closer the area is to a watercourse, the greater will be the risk.
- slope of the land will be one of the most significant factors– the steeper the downward slope towards the watercourse the greater will be the risk. Slopes of over three degrees (1 in 14) should be considered moderate risk and those above eight degrees (1 in 7) considered high risk. Fields with slopes which tend to converge or fall to a specific low point or corner of the field near to a watercourse will have a particular high risk of causing pollution. Long, uninterrupted slopes are also of greater risk of erosion
- past experience – consider where it has previously been noted that surface run-off has entered a watercourse or where soil erosion has occurred
- soil texture – light soils with a high sand content are at greater risk of erosion

Once the assessment has been completed, identify on the map those areas which are at risk of soil erosion and which may potentially pollute a watercourse. Mark on the map where the pond would be best located to intercept the run-off and where it should discharge to.

Design guidelines

Anyone considering creating a Rural SuDS on their farm should refer to the recently published (December 2016) guidance document - Rural Sustainable Drainage Systems - A Practical Design and Build Guide for Scotland's Farmers and Landowners .

This guide was written with the SRDP in mind and will help you to select, size, design, and build the most suitable Rural SuDS for your farm.

Maintenance

Importantly the above guidance document also explains how to look after the systems and maintain them which is essential in order to optimise their effectiveness. It also promotes the wider benefits such as coping with extreme weather related to climate change, localised flood prevention and enhancing biodiversity.

Factors affecting performance

- it's important to remember that ponds are not intended to treat slurry or silage effluents but to help to treat run-off which currently discharges directly to a watercourse
- short circuiting and leakage can reduce effectiveness and should be considered at the design stage
- minimise the volume or level of polluted run-off that the pond must deal with. On a steading, several localised grass swales (or grass margins) may be a more practical option than creating one large feature on a steading. Within an arable field, measures such as running tramlines across slopes, relieving compaction, creating within field buffers etc will help to reduce the risk of soil erosion
- ponds are best used as part of a treatment chain whereby combinations of rural sustainable drainage systems are used, such as a sediment trap, swale and then a pond

Further information

- Rural Sustainable Drainage Systems - A Practical Design and Build Guide for Scotland's Farmers and Landowners, CREW (2016)
- The SuDS Manual CIRIA Report C753, CIRIA
- Diffuse Pollution, Campbell et al (2004), IWA Publishing, ISBN: 1 900222 53 1
- Sedimentation in Small Constructed Wetlands. Retention of Particles, Phosphorus and Nitrogen in Streams from Arable Watersheds, Braskerud BC (2001), Doctor Scientiarum Theses 2001:10, Agricultural University of Norway, As, Norway, ISSN: 0802-3220
- Ponds, Pools and Lochans, SEPA (2000)

Annex – Identifying run-off types

In general, farm steadings, particularly livestock farms, produce a wide range of run-off ranging from relatively clean roof water to highly contaminated run-off and slurry.

Roof run-off can be considered relatively clean and may already directly discharge to a watercourse. Exceptions may include poultry or pig house roofs with roof vents. Also, any buildings or areas constructed after 1 April, 2007 must be drained by a sustainable drainage system, and roof water can discharge to a closed soakaway or to a watercourse via an infiltration trench or swale.

Yard run-off tends to vary to a greater degree in its polluting load. Therefore, for the purpose of producing the plan for this option, run-off should be classified as:

Slurry and silage effluent

The Water Environment (Controlled Activities) (Scotland) Regulations 2011 as amended - known as CAR, defines slurry as excreta produced by livestock while in a yard or building and includes a mixture of run-off containing excreta, bedding etc, from yards and buildings used by livestock and middens, weeping wall structures etc.

Silage effluent is defined by CAR to include effluent produced from any forage crop which is being made or has been made into silage. This will also include any mixture consisting wholly of or containing such effluent or run-off emanating from a silo or silage effluent collection system.

Run-off from such areas requires to be collected in a suitable storage system. However there is a provision to allow certain types of slurry and silage effluent to be conveyed to a constructed farm wetland that has been designed in accordance with the Constructed Farm Wetland Design Manual. The types of slurry that can be conveyed to such constructed farm wetlands for treatment includes run-off which mainly consists of rainwater and washings which derive from:

- an outdoor midden containing farmyard manure
- a midden which mainly contains farm yard manure and is situated where its contents can be affected directly by precipitation,
- any uncovered yard, used by livestock occasionally to move from one area to another,
- a yard which is used for the gathering or holding of livestock no more than once a week and which can be directly affected by precipitation,

Slurry must not be drained through a constructed farm wetland from areas -

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- where livestock are gathered or held more than once a week, or
- used for livestock movement or holding prior to, during or after being—
    - milked,
    - housed, or
    - fed
- which may be contaminated with pesticide

Silage effluent which consists mainly of rainwater may be drained through a constructed farm wetland only if -

(i) the silo is open for use,

(ii) the drainage of the silage effluent from the silo to the constructed farm wetland is direct and through a separate channel or pipe from the base of the silo,

(iii) no crop is added to the silo whilst it is open.

All reasonable steps must be taken to ensure that the drainage of slurry through a constructed farm wetland does not cause pollution of the water environment.

Lightly contaminated run-off

This could include drainage from yards and areas where livestock do not frequently have access, which are not contaminated with oils and pesticides. It is accepted that such areas will build up a degree of contamination from passing machinery and other activities carried on nearby. In the majority of cases this run-off would be suitable for treatment via a rural sustainable drainage system or alternatively could discharge to local grassed areas.

Dairy washings

This includes washings from the milking parlour and rinsings from the milk storage tank(s), milking machine and ancillary equipment. These types of effluent can be highly polluting and should be collected in a slurry storage facility or a dedicated storage tank.

Pesticide contaminated run-off

Drainage from pesticide handling and loading areas must not be allowed to discharge into a surface water drainage system or a rural sustainable drainage system. There is a capital item available for upgrading pesticide handling facilities.

Recent changes

Section	Change
Design Guidelines	Removal / Insertion of information links
Annex - Slurry and silage effluent	Text changes and updates

Previous versions

Previous versions of this page

Related content

Capital item for Rural Sustainable Drainage Systems – Retention Pond