How to comply with your environmental permit for intensive farming

Appendix 8

Undertaking a drainage review

Version 3

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Published by:
Environment Agency
Horizon House
Deanery Road
Bristol BS1 5AH
Tel: 0370 8506506

Email: enquiries@environment-agency.gov.uk
www.environment-agency.gov.uk

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Record of changes:

Version	Date	Change
1	February 2008	Published Version
2	January 2010	Guidance republished as an appendix to version 2 of How to comply with your environmental permit for intensive farming. Technical content of guidance is unchanged.
3	February 2012	Amended to reflect the need to submit review with application. Technical content of guidance is unchanged.

Introduction

All farms permitted under the Environmental Permitting Regulations (formerly the Pollution Prevention and Control Regulations) must make sure that there's no pollution from the design and management of drainage systems and run-off.

All new installations must meet BAT (Best Available Techniques) standards **before** a permit is issued. If you have an existing farm which is expanding above the threshold, you should review your existing site drainage and identify all aspects of the design and management which does or doesn't meet BAT standards. Where you identify any improvements you can make to either the design or management of drainage to reduce the emissions, you should submit an Improvement Plan with a timetable for implementation **with your application**. This plan may be included as part of an improvement programme within your permit.

Any plan should take account of the appropriate measures identified in S3.3 of TGN How to Comply, Version 1 (or Version 2).

Reviews which include planned improvements for future implementation will be assessed against the risks of pollution before a permit is issued.

What does the review involve

For some, the review of drainage may be simple, and will result in very little action required to be included in the plan. For others, the resulting actions will be more extensive. The purpose of this guidance is to take you through the review step by step, so that you can identify where there are risks to the environment and where improvements can be made. These will be either by changing management practises (doing things differently) or adapting/installing physical structures (gutters, downpipes, drains etc.). The changes you identify will form the actions in your plan.

What you need to do – the four steps

The review looks at all sources of drainage, the pathways by which they travel on your site and the receptors that receive the drainage.

Step 1- You should start with the site drainage plan that was completed as part of your permit application (reference - Factsheet 3 Producing a site drainage plan - see our website). Enlarge the plan so that you can clearly see all your drainage system with the accompanying symbols.

Step 2 - Take a walk around your farm and complete the questionnaire as you go with either 'yes', 'no' or 'not applicable' (n/a). An answer 'yes' or 'n/a' means little or no action is required, but a 'no' will require action to be included in the plan.

Note where an installation includes multiple sites, there will need to be a drainage review for each site.

Step 3 - Confirm what you originally submitted is still correct and add in any missing pathways, storage, manhole covers, diverter valves etc. using your own key for symbols or Factsheet 3 or PPG21 Pollution incident response planning.

For pathways and boundaries, we suggest:

- Use **BLUE** for clean water sources, pathways and receptors. Include the boundaries of clean concrete and grassed areas.
- Use **RED** for dirty water, slurry and other contaminants, their sources, pathways and receptors.
- Use **PURPLE** for lightly contaminated water discharging through swales and soakaways, the sources, pathways and receptors.

For plant we suggest the following symbols:

Key Component	***Suggested Symbol***
Clean water drains (uncontaminated)	
Lightly contaminated water drains	
Dirty drains and slurry channels	
Manholes and inspection chambers	IC
Diverter valve	x DV
Direction of water flow	
Drain inlet	C C C
Bunded area	
Location of any watercourses, ponds, soakaways, swales etc.	
Identify any slurry and dirty water tanks + state capacity.	
Location of mains water stop-tap, boreholes, wells, springs etc.	

Note - There is a checklist at the end of the questionnaire to remind you what should be shown on your plan.

Step 4 - You should identify any actions necessary to comply with the permit conditions. **Any question that was answered with a 'no' will be an action that needs to be addressed**. You should identify the timescales for their completion and estimated costs. The plan must be approved by the Environment Agency before its implementation.

These decisions can be recorded in the **drainage action plan**. This is the blank table at the end of this document. It includes some examples to give ideas as to the possible issues that may be identified in carrying out a site drainage review.

Questionnaire

Receptors - where does the drainage end up - the outfall or destination of liquids
On the site drainage plan a **receptor** may be identified as either an engineered structure for the storage and subsequent managed disposal or a point of unmanaged discharge to controlled waters:

- **Engineered structures** – lagoons, above-ground tanks, below ground tanks, reception pits – usually receive only contaminated water and slurries.
- **Surface waters** - ponds, rivers and ditches– these may only receive uncontaminated water.
- **Groundwater-** swales and soakaways – these may only receive uncontaminated or lightly contaminated water

Question		Guidance	Answer Yes/No/N/A	Comments
1	**Is (are) the receptor(s) clearly identified on the plan?**	Show the location and boundary of engineered structures. Ensure that the plans also show the location of surface waters and groundwater, swales and soakaways.		For example, a soakaway by house 3 was missed off the Site plan.
2	**Is it (are they) accessible at all times?**	Access paths should be kept clear of nettles/thistles etc. to allow inspection by both the operator and the Environment Agency at all times. Answer for each receptor identified if more than one. Observe site health and safety issues when dealing with slurry stores.		
3	**Are all sources identified that discharge to your receptors?**	Where are the discharge points into ponds and ditches? As this water must be clean sources must be identified. Have you identified the source of all of the pipes discharging to your engineered structures and other receptors?		For example, there's a drainpipe running to the ditch, that I don't know the source for.

Question		Guidance	Answer Yes/No/N/A	Comments
4(a)	**Are inlet points known?**	The inlet and outlet points to dirty water stores should be identified The inlet points to swales and soakaways should be identified. How is water level maintained in ponds? Is there an outflow, where is it and to what does it discharge and is it controlled? Where there is no outflow and the pond does not overflow, is the pond leaking to groundwater? .		
4(b)	**Are outlet points known?**			
5	**Are structures appropriately sized and constructed?**	Engineered structures should be of sound design and maintained to ensure their integrity. They should be of sufficient size to meet both the operational requirements of the individual installation and to meet statutory long-term storage requirements. These are the Control of Pollution (Silage, Slurry and Fuel Oil) Regulations at all installations (and the Nitrate Vulnerable Zones Regulations where appropriate). Structures should be managed to make sure the correct freeboard is maintained and that overfilling doesn't occur. Good construction, management, maintenance and appropriate sizing also applies to swales.		

Question		Guidance	Answer Yes/No/N/A	Comments
6	**Can receptors be managed to protect the environment?**	Can all of the receptors be protected? Can all discharges to them be contained, blocked, by-passed or isolated if necessary (this should be established in the accident management plan)? Can they be monitored in an emergency? How do you know when they are full or empty?		
7	**Is the quality of run-off consistent in all cases even though the quantity may fluctuate?**	The quality of run-off can change? Clean water flows can become temporarily dirty (for example, concrete driveways during shed cleanouts). If this can happen you will need a diversion system in place. If there's no diversion system installed then the run-off will need to be permanently treated as dirty water and directed to a suitable receptor. This may place a large storage burden on an engineered structure. There may also be subsequent disposal costs. This may be an area where operators can make cost effective improvements to their site drainage.		

Pathways – how does the drainage get there – the route that liquids take

On the site drainage plan the pathway should be identified by arrows showing the direction of flows, the location of drain inlets and access points (manhole covers and inspection chambers). The pathways are likely to be one of the following three categories:

- Gutters, downpipes and drains – may be piped pathways fixed or temporary (rigid or flexible), above ground or buried, gravity fed or pumped.
- Overland flow – may be planned and marshalled (yards and slopes).
- Channels, gullies and drain inlets – may be directing flow or intercepting it (to protect buildings and structures).

Question		Guidance	Answer Yes/No/N/A	Comments
8	**Are all pathways shown on the plan?**	The route should be shown in its entirety including direction of flow.		
9	**Are all manholes and inspection covers shown on the plan?**	Use the standard symbols to describe these. The key to symbols to use is in the 'Introduction' to this document.		
10	**Are they identified as either clean, dirty or lightly contaminated on the plan?**	This refers to their identification and designation on the plan. Where a diverter is in place to deal with flows of variable quality then the plan should show this and identify all of the categories that may use the pathway.		
11	**Are they identified on site as clean or dirty by coloured paints?**	Are all manholes, inspection chambers, drain inlets etc. identified by paint marks of the appropriate colour to signify their contents - red for dirty, blue for clean? Mark the direction of flow in the appropriate colour.		

Question		Guidance	Answer Yes/No/N/A	Comments
12	**Are all gutters downpipes and drains in good condition?**	Are they entire (are there missing and broken gutters)? Do they connect to a satisfactory downpipe? Does it discharge to a drain and does the drain exclusively service the gutter (is the water clean and will it remain uncontaminated)? Are they adequately sized (downpipe frequency, diameter etc.)? Are they fitted with filters? Are they maintained and do they work?		
13	**Are sleeping policemen, diverters or interceptors identified on the plan?**	Overland flow is a major feature of all farm installations. For each surface flow pathway the following points should be considered and documented: • Is it concrete and is it impermeable (not cracked or potholed)? • Are there any deviation devices – sleeping policemen, interceptors? • Is there any sectioning for clean and dirty water separation and is this permanent or temporary. If so does it change during the year at peak times such as mucking out or stock movement? • Is the flow ever impeded or contaminated by temporary storage of manures, straw, feedstuffs etc. if so is it diverted if it was previously clean?		

Question		Guidance	Answer Yes/No/N/A	Comments
14	**Does the plan show the limits of both concreted and grassed areas?**	Some clean water/rainfall may be disposed of on grassed areas or soakaways. Some run-off may initiate from grassed and unconcreted areas. Some areas may have surfaces made from tarmac, bitmac or compacted road planings. They should be shown on the plan as either a source, pathway or a receptor (or a combination).		
15	**Are all drain inlets, channels and gullies identified on the plan?**	Channels, gullies and drain inlets: • Where are they? • Are they part of an integrated system with junctions and inspection chambers? • What is near them and are there high risk activities upslope of them? If so are safeguards in place (kerbs installed, emergency drain covers etc)? Do they take clean or potentially clean water?		
16	**Do they take clean or contaminated water and does the plan show this?**	Are they identified by either red or blue colouring on the plan as appropriate? If there are flows of variable quality then use more than one colour as appropriate.		

Sources and pollutants – where does the drainage come from and what is it

On the site drainage plan a source will be shown as a physical structure. This may include:

- buildings, tanks, hoppers, raceways, yards, reception pits, clamps, incinerators, wheel washes etc.

Depending on what the structure is, it will generate a range of liquids and possible contaminants.

Question		Guidance	Answer Yes/No/N/A	Comments
17	**Are all sources included on the plan and are they clearly identified?**	Are all the buildings included on the plan?		
18	**Is the roof water from the structure uncontaminated?**	The collection of rainwater from roofs is the most obvious source of potentially uncontaminated liquid (clean water). This, and run-off from clean yard surfaces is the only material that can be directed straight to a watercourse. However, where there are roof vents, roof water is assumed to be contaminated and should be intercepted.		
19	**Is the rainfall collected from yard areas uncontaminated?**	Provided that they are kept clean, run-off from yards can be classed as uncontaminated. Yard cleanliness may be periodic. During shed emptying or livestock removal they may be dirty and some form of drainage diversion will be necessary.		

Question		Guidance	Answer Yes/No/N/A	Comments
20	**Are all contaminated liquids directed to a managed receptor?**	Other materials that may be generated from buildings may include: • Slurry (from manure stores, seepage from buildings and passageways, scraping routes etc.). • Fuels and oils, pesticides, disinfectants. • Feedstuffs – spillages and dust from milled products. Pressure washing areas can also be a source of contaminated water.		
21	**Are any lightly contaminated sources directed to swales or soakaways?**	Dust from buildings with side-wall ventilation systems and rainfall from roof-vented sheds may create contaminated water. This may be disposed of via a swale or a soakaway taking account of groundwater vulnerability. Soakaways may not be appropriate if the site is on a major aquifer.		
22	**Has the release of all contaminants been minimised where possible?**	The risk from contaminants may occur continuously from rainfall, scraping down, seepage, ventilation fans etc. Other contaminants may be only occasionally released from delivery of fuels, pesticides, feedstuffs, shed clearance and cleaning at the end of rearing cycles. Rarer risks arise from accident and emergency situations. Most sources and risks can be minimised by bunding stores, kerbing muck pads, installing sleeping policemen in muck passage doorways etc.		

As well as identifying the condition and effectiveness of drainage on the site, this review can be used to produce a good written plan. The following section explains how using the answers can contribute to this. Remember, a site with very poor drainage can still have a very accurate plan of it and vice versa.

Checklist – are the following included on your drainage plan?

Points to be shown on plan	Tick if included on plan
The location of all receptors	
All buildings, structures and other sources of drainage	
Points where clean water discharges to ditches, rivers and watercourses	
Outfall points into dirty water lagoons and their emptying points	
Boundaries of grassed areas, swales and soakaways	
Pathways using blue where the flows are clean water	
Pathways using purple where the flows are lightly contaminated water	
Pathways using red where the flows are dirty water	
Access points into the pathways and coloured accordingly	
Inspection points and manholes and coloured accordingly	
Diverters, interceptors and sleeping policemen	

Drainage action plan – with examples in italics

Issue	Action	Proposed timescale for completion	Estimated cost £	Timescale agreed with Environment Agency
Sources of drainage (Q3)	Identify the source of the drainage to ditch using dye tracing down manholes.	12 months	20	
Access to receptors and inspection points (Q2)	Weed clearing around soakaways and ditches added to grass-cutting programme.	Immediate	0	
Size of structures, alarms etc. (Q5 & 6)	Review slurry storage capacity in light of NVZ revisions. Input from Environment Agency needed.	3 months	0	
Overflow management (Q6)	Broiler house washing procedures to be modified to include manning of wash water tanks to oversee filling and raise alarm if level reaches to within xm3 capacity.	Immediate	500	
Installation and safe operation of diversion features (Q7 &13)	Maintain and improve existing features – lift and clean gratings from dirty water drainage channel in front of sheds.	Immediate	0	
Old wash water tank	Replace old wash water tank located at house 3 with new underground tank.	6 months	5000	