Drainage Review for Grove Farm Pig Unit

Propose 4no. houses be permitted for rearing pigs intensively with total capacity for 4,000 places for production pigs >30kg. Present day 2no. existing houses have a total capacity for 2,000 places and propose to erect 2no more houses with capacity for additional 2,000 places. Houses will be naturally ventilated with side inlets for fresh air (no extraction fans). Inlets created with Galebreaker curtains which can be raised or lowered automatically to increase or decrease the volume of fresh air into the houses.

Conducted a drainage review to demonstrate there will be no pollution from the design and management of the drainage systems and run-off in accordance with the template in the Environment Agency; EPR 6.09 Sector Guidance Note; Appendix 8; Undertaking a drainage review; Version 3; February 2012.

Table 1 Summary of drainage

Name of building	Function	Is Drainage Management BAT or not BAT?	Is Drainage Design BAT or not BAT?	Is it identified in Drainage Improvement Plan?
Pig houses Nos.1-4	Production pigs >30 kg	Yes, including interception of lightly contaminated surface water runoff the concrete apron under walls of houses 1-4 with side outlets for natural ventilation into the top of onsite ditch via point W2 and onsite pond via W4.	Yes, including interception of lightly contaminated surface water runoff the concrete apron under walls of houses 1-4 with side outlets for natural ventilation into the top of onsite ditch via point W2 and onsite pond via W4.	No

Table 2 Drainage improvement plan

Area needing improvement	What needs to be done – possible solutions	Proposed cost	Proposed timescale for completion	Timescale agreed with the Environment Agency
N/a	N/a	N/a	N/a	N/a

No.	Question	Guidance	Answer Yes/No/N/a	Comments

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 only receive contaminated water or slurries.
- Surface waters – ponds, rivers, and ditches – these only receive uncontaminated water.
- Groundwater – swales and soakaways – these may only receive uncontaminated or lightly contaminated water

Table 3 Receptors – where does the drainage end up – the outfall or destination of liquids

1	Are the receptors clearly identified on the plan?	Show the location and boundary of engineered structures. Ensure plans also show the location of surface waters and groundwater, swales, and soakaways.	Yes	
2	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.	Yes	

No.	Question	Guidance	Answer Yes/No/N/a	Comments
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.	Yes	Uncontaminated roof water from manure barns and pig houses 1-3 into onsite ditches via emission points W1 and W2, respectively and uncontaminated roof water from pig houses 4 into pond via point W4. Propose lightly contaminated surface water runoff the concrete apron under walls of houses 1-3 with side outlets for natural ventilation into the top of onsite ditch via point W2 and from under walls of houses 3-4 into onsite pond via W4. Before lightly contaminated drainage reaches surface water systems: • the top of the ditch is providing interception and soakaway • the pond is providing interception.
		Have you identified the source of all of the pipes discharging to your engineered structures and other receptors?	Yes	
4a	Are inlet points known?	The inlet and outlet points to dirty water stores should be identified.	Yes	
		The inlet points to swales and soakaways should be identified.	Yes	Grassed areas east and west side of pig houses 1 and 2 provide interception before drainage reaches surface water systems.

No.	Question	Guidance	Answer Yes/No/N/a	Comments
4b	Are outlet points known?	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?	Yes N/a	Pond outflow via emission point W5 into offsite surface water systems and positioned to maintain the high-water level in the pond and prevent surface water flooding. No controls required.
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).	Yes	

No.	Question	Guidance	Answer Yes/No/N/a	Comments
		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 apply to swales.	Yes N/a	
6	Can receptors be managed to protect the environment?	Can all 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?	Yes Yes Yes	
7	Is the quality of run-off	The quality of run-off can change.	No	Expect runoff to be consistent although quantities may fluctuate

No.	Question	Guidance	Answer Yes/No/N/a	Comments
	consistent in all cases even though the quantities may fluctuate?	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.		

Table 4 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:-

No.	Question	Guidance	Answer Yes/No/N/a	Comments

- 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 the buildings and structures).

8	Are all pathways shown on the plan?	The route should be shown in its entirety including direction of flow.	Yes	
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.	No	Drainage schematic is considered to be adequate to show sources, inlets, outlets and drainage routes
10	Are they identified as - 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 the flows of variable quality then the plan should show this and identify all of the categories that may use the pathway.	Yes	
11	Are they identified on site	Are all manholes, inspection chambers, drain inlets, etc	No	Not considered necessary

No.	Question	Guidance	Answer Yes/No/N/a	Comments
	as clean or dirty by coloured paints?	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.		
12	Are all gutters, downpipes and drains in good condition?	Are they entire (are there missing or broken gutters)? Do they connect to a satisfactory downpipe?	Yes	Good condition
		Does it discharge to a drain and does the drain exclusively service the gutter (is the water clean, and will it remain uncontaminated)?	Yes	
		Are they adequately sized (downpipe frequency, diameter, etc?)	Yes	
		Are they fitted with filters?	No	Not considered necessary

No.	Question	Guidance	Answer Yes/No/N/a	Comments
		Are they maintained and do they work?		
13	Are sleeping policeman 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 pot holed)?	Yes	Concrete apron in between pig houses 1-4
		• Are there any deviation devices – sleeping policeman, interceptors?	Yes	Before lightly contaminated drainage reaches surface water systems: • the top of the ditch is providing interception and soakaway • the pond is providing interception.
		• 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?	Yes	Permanent separation of uncontaminated and lightly contaminated roof and surface water runoff and slurry.

No.	Question	Guidance	Answer Yes/No/N/a	Comments
		• 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?	No	
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 non-concreted areas. Some areas may have surfaces made from tarmac, bitmac or compacted road planings. They should be shown on the plan as a source,	Yes N/a Yes N/a	Before lightly contaminated drainage reaches surface water systems: • the top of the ditch is providing interception and soakaway • the pond is providing interception. Roadway east side of house 1 and south side of houses 1-4 made from compacted materials.

No.	Question	Guidance	Answer Yes/No/N/a	Comments
		pathway, or receptor (or a combination).		
15	Are all drain inlets, channels and gullies identified on the plan?	• 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?	Yes Yes Yes Yes	Drainage schematic is considered to be adequate to show sources, inlets, outlets and drainage routes Separate channels, inlets and storage for slurry
16	Do they take clean or contaminated water and does	Are they identified by either red or blue colouring on the plan as appropriate? If there are flows of variable quality	Yes	Used the suggested colours in SGN EPR6.09

No.	Question	Guidance	Answer Yes/No/N/a	Comments
	the plan show this?	then use more than one colour as appropriate.		

Table 5 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.

17	Are all sources included on the plan and are they clearly identified?	Are all the buildings included on the plan?	Yes	
18	Is the roof water from the structure uncontaminated ?	The collection of rainwater from the 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	Yes	Uncontaminated roof water owing to natural ventilation through side walls

No.	Question	Guidance	Answer Yes/No/N/a	Comments
		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.	No	Lightly contaminated surface water runoff the concrete apron in between houses 1-4 with side outlets for natural ventilation
20	Are all contaminated liquids directed to a managed receptor?	Other materials 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	Yes	

No.	Question	Guidance	Answer Yes/No/N/a	Comments
		• Pressure washing areas can also be sources of contaminated water.		
21	Are any lightly contaminated sources directed to swales and 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.	Yes	Before lightly contaminated drainage reaches surface water systems: • the top of the ditch is providing interception and soakaway • the pond is providing interception. Site Condition Report: • Principal bedrock aquifer onsite. • In combination the productive bedrock aquifer and productive superficial aquifer have medium groundwater vulnerability classification.
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	Yes	

No.	Question	Guidance	Answer Yes/No/N/a	Comments
		arise from accident and emergency situations. Most sources and risks can be minimised by bunding stores, kerbing muck pads, installing sleeping policeman in muck passage doorways etc.		

Table 6 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 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	✓