

## Drainage Review Lingar Hill Farm Poultry Unit

Further development proposed at Lingar Hill Farm Poultry Unit for a third purpose-built poultry house next to two existing poultry houses. Will be expanding the number of places for rearing broiler chickens intensively above the >40,000 threshold under the Environmental Permitting Regulations so the operators will be obliged to obtain an environmental permit before bringing the third poultry house into operation. Provided a drainage review to make sure the installation will meet best available techniques (BAT) standards and there will be no pollution from the design and management of the drainage systems and run-off in accordance with Environment Agency; EPR 6.09 Sector Guidance Note; Appendix 8; Undertaking a drainage review; Version 3; February 2012:

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?
Poultry house Nos.1&2	Broiler chickens	BAT	BAT	Yes
Poultry house No.3	Broiler chickens	BAT	BAT	N/a

### 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
Pathways (Q12)	Repair gutters separated at union brackets, replace entire lengths of detached gutter and broken and missing stop ends, and missing downpipes, etc on houses 1&2.	Not significant.	To be completed before bringing house No.3 into operation.	

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

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	<ul style="list-style-type: none"> <li>• New package below ground storage tank for dirty water from destocking and washing out all 3 houses will be installed same time as third house. Replacing existing concrete apron and two smaller tanks for houses 1&amp;2.</li> <li>• Stone filled French drains under eaves of the houses with perforated pipes also acting as soakaways into groundwater for uncontaminated roof-water runoff.</li> <li>• Uncontaminated roof &amp; surface run off (excluding periods during destocking and washing out) conveyed into an offsite natural watercourse - Larling Brook, a tributary of the River Thet.</li> </ul>
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	<ul style="list-style-type: none"> <li>• New package dirty water storage tank will be accessible for inspection and emptying via a covered manhole at ground level at all times.</li> <li>• French drains with perforated pipes generally considered to be passive below ground structures, entirely covered and not expected to require inspection or maintenance during the lifetime of the installation.</li> <li>• Discharge point into the offsite watercourse will be kept accessible.</li> </ul>

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	<ul style="list-style-type: none"> <li>Uncontaminated roof-water run-off all the houses into French drains acting as soakaways into groundwater and discharged into the offsite watercourse, identified as W1 on the plan.</li> <li>Uncontaminated surface water runoff the concrete apron (excluding periods during destocking and washing out) also discharged into the watercourse at point W1, otherwise diverted into dirty water tank during destocking and washing out.</li> </ul>
		Have you identified the source of all of the pipes discharging to your engineered structures and other receptors?	Yes	<ul style="list-style-type: none"> <li>French drains for uncontaminated roof-water runoff into groundwater and also discharged into the offsite watercourse.</li> <li>Grated, catch-pit for uncontaminated &amp; contaminated surface runoff from the concrete apron in front of the poultry houses and discharged into the offsite watercourse or diverted into the dirty water tank, respectively.</li> </ul>
4a	Are inlet points known?	The inlet and outlet points to dirty water stores should be identified.	Yes	<ul style="list-style-type: none"> <li>Grated, catch-pits outside doors of all houses for dirty water from washing out.</li> <li>Grated, catch-pit in the concrete apron for contaminated surface water from washing out.</li> <li>Dirty water storage tank.</li> </ul>
		The inlet points to swales and soakaways should be identified.	Yes	Perforated pipes in French drains acting as soakaways to groundwater.
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?	N/a	
		Where there is no outflow and the pond does not overflow, is the pond leaking to groundwater?	N/a	

No.	Question	Guidance	Answer Yes/No/N/a	Comments
5	Are structures appropriately sized and constructed?	<p>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).</p> <p>Structures should be managed to make sure the correct freeboard is maintained, and that overfilling doesn't occur.</p> <p>Good construction, management, maintenance, and appropriate sizing also apply to swales.</p>	<p>Yes</p> <p>Yes</p> <p>N/a</p>	<ul style="list-style-type: none"> <li>• Professional builders will be providing appropriate design and sizing for installing the drainage systems and dirty water storage tank.</li> <li>• Site is located within a Nitrate Vulnerable Zone (NVZ) according to the MAGIC land-based designations map. These are areas where surface and groundwater are at risk from agricultural nitrate pollution. Operators will be following mandatory rules to tackle nitrate loss from agriculture.</li>   <li>• Professional contractors scheduled for emptying the dirty water tank after washing is finished in readiness for the next time to avoid overfilling.</li> </ul>

No.	Question	Guidance	Answer Yes/No/N/a	Comments
6	Can receptors be managed to protect the environment?	<p>Can all the receptors be protected?</p> <p>Can all discharges to them be contained, blocked, by-passed, or isolated if necessary (this should be established in the accident management plan)?</p> <p>Can they be monitored in an emergency? How do you know when they are full or empty?</p>	Yes	<ul style="list-style-type: none"> <li>• Dirty water from normal washing and foreseeable spillages for example disinfectants, diesel, etc can be directed into the dirty water tank via the catchpit in the concrete apron and diverter valve while the apron is cleaned up and protecting controlled water in the watercourse. Tank will be readily accessible and easily inspected and professional contractors can be arranged to empty the tank any time to avoid not having enough capacity for the next washing out.</li> <li>• No foreseeable risk of pollution in any French drains acting as soakaways.</li> </ul>
7	Is the quality of run-off consistent in all cases even though the quantities may fluctuate?	<p>The quality of run-off can change.</p> <p>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</p>	No	<ul style="list-style-type: none"> <li>• Surface runoff the concrete apron will be temporarily contaminated during cleaning and washout out end of each rearing cycle. The dirty water tank comes with a package diverter valve to channel dirty water into the tank, and at all other times will channel uncontaminated surface runoff into the surface drainage system into the offsite watercourse.</li> <li>• Quality of uncontaminated roof-water runoff will not change.</li> </ul>

No.	Question	Guidance	Answer Yes/No/N/a	Comments
		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 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	<ul style="list-style-type: none"> <li>• Grated gullies outside poultry houses for dirty water from washing out.</li> <li>• Solid underground pipes conveying dirty water into the dirty water storage tank.</li> <li>• Overland flow on concrete apron. Will slope into catch pit and solid underground pipes to the discharge point into the ditch, or into dirty water storage tank via a diverter during periods of destocking and washing out.</li> <li>• Roof water into gutters and downpipes on poultry house 1&amp;2 only.</li> <li>• Stone filled French drains under eaves of all the houses with perforated pipes also acting as soakaways into groundwater and solid underground pipes to the discharge point into the watercourse.</li> </ul>
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.	Yes	<ul style="list-style-type: none"> <li>• Grated gullies outside poultry houses for dirty water from washing out.</li> <li>• Manhole access into dirty water storage tank.</li> <li>• Inspection cover for diverter valve access.</li> <li>• Grated catchpit for surface runoff.</li> </ul>

No.	Question	Guidance	Answer Yes/No/N/a	Comments
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	In accordance with How to comply:- <ul style="list-style-type: none"> <li>Marked in red to identify dirty drains water, pathways, and receptors.</li> <li>Marked in blue to identify clean water sources, pathways, and receptors.</li> </ul>
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.	No	Not considered necessary.
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?  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?)	No	<ul style="list-style-type: none"> <li>Gutters and downpipes installed on poultry houses 1&amp;2 only.</li> <li>Drainage designed, sized, and installed by professional builders when the houses were erected sometime before 2003.</li> <li>Leaf and debris gully not been installed at the foot of any downpipes.</li> <li>Discharge into stone filled French drains with perforated pipes also acting as soakaways exclusively for uncontaminated roof water runoff.</li> <li>Some gutters separated at union brackets, entire lengths of gutter detached, some broken and missing stop ends, some missing downpipes, etc on both houses observed in May 2021. No evidence for any significant pooling, overland flow or vegetation being submerged for any prolonged periods, etc and freely draining sandy Breckland soil, probably providing a ready soakaway.</li> <li>No gutter or downpipes will be installed on new third poultry house, French drains to be installed under the eaves with perforated pipes also acting as soakaways and uncontaminated runoff discharged into watercourse.</li> </ul>

No.	Question	Guidance	Answer Yes/No/N/a	Comments
		<p>Are they fitted with filters? Are they maintained and do they work?</p>		
13	Are sleeping policeman diverters or interceptors identified on the plan?	<p>Overland flow is a major feature of all farm installations. For each surface flow pathway, the following points should be considered and documented:</p> <ul style="list-style-type: none"> <li>• Is it concrete and is it impermeable (not cracked or pot holed)?</li> <li>• Are there any deviation devices – sleeping policeman, interceptors?</li> <li>• 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?</li> <li>• Is the flow ever impeded or contaminated by temporary storage of manures, straw, feedstuffs, etc. If so, is it</li> </ul>	<p>No</p> <p>Yes</p> <p>N/a</p>	<ul style="list-style-type: none"> <li>• Concrete apron designed and installed by professional builders when the houses were erected sometime before 2003.</li> <li>• Generally, remains impermeable and in good condition, except where there is some widening of joints and cracked apron outside house 1 observed in May 2021, possibly result of HGVs manoeuvring.</li> <li>• Concrete apron in front of all the houses and underground drainage to be replaced with the further development for a third house. Including installing grated gullies outside all the poultry houses for dirty water from washing out, sealed kerbs and a new concrete apron sloping into a catch pit for surface water runoff and solid underground pipes to the discharge point into the watercourse, or into a new, package dirty water storage tank via a diverter during periods of washing out.</li> </ul>



No.	Question	Guidance	Answer Yes/No/N/a	Comments
		diverted if it was previously clean?		
14	Does the plan show the limits of both concreted and grassed areas?	<p>Some clean water/rainfall may be disposed of on grassed areas or soakaways.</p> <p>Some run-off may initiate from grassed and non-concreted areas.</p> <p>Some areas may have surfaces made from tarmac, bitmac or compacted road planings.</p> <p>They should be shown on the plan as a source, pathway, or receptor (or a combination).</p>	<p>Yes</p> <p>N/a</p> <p>N/a</p> <p>N/a</p>	Stone filled French drains with perforated pipes also acting as soakaways exclusively for uncontaminated roof water runoff from all the poultry houses.
15	Are all drain inlets, channels and gullies identified on the plan?	<ul style="list-style-type: none"> <li>• Where are they?</li> <li>• Are they part of an integrated system with junctions and inspection chambers?</li> <li>• What is near them and are there high-risk activities upslope of them? If so are safeguards in place (kerbs</li> </ul>	<p>Yes</p> <p>Yes</p> <p>Yes</p>	Grated gullies outside poultry houses for dirty water from washing out and will be conveyed via solid underground pipes into a new package dirty water storage tank.

No.	Question	Guidance	Answer Yes/No/N/a	Comments
		installed, emergency drain covers etc)? <ul style="list-style-type: none"> <li>Do they take clean or potentially clean water?</li> </ul>	Yes	Replacement concrete apron will slope into catch pit for surface water runoff and solid underground pipes to the discharge point into the watercourse, or into dirty water storage tank via a diverter during periods of washing out.
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.	Yes	In accordance with How to comply:- <ul style="list-style-type: none"> <li>Marked in red to identify dirty drains water, pathways, and receptors.</li> <li>Marked in blue to identify clean water sources, pathways, and receptors.</li> </ul>

### 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	
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No.	Question	Guidance	Answer Yes/No/N/a	Comments
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 contaminated and should be intercepted.	Yes	Forced ventilation installed in all the poultry houses with high velocity extraction fans (vents greater than 5.5 metres high and fan efflux velocity greater than 7m/s). Optimising discharge conditions of exhaust air from all the poultry houses by maximising vertical outlet velocity - designed and installed with uncapped outlet cones to avoid dust settling on roof.
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.	Yes	Concrete apron slopes into catch pit for surface water runoff and solid underground pipes to the discharge point into the watercourse, or into a new, package dirty water storage tank via a diverter during periods of destocking and washing out.
20	Are all contaminated liquids directed to a managed receptor?	Other materials may be generated from buildings may include: <ul style="list-style-type: none"> <li>• Slurry (from manure stores, seepage from buildings and passageways, scraping routes, etc)</li> </ul>	Yes	Concrete apron slopes into catch pit for surface water runoff and solid underground pipes to the discharge point into the watercourse, or into a new, package dirty water storage tank via a diverter during periods of destocking and washing out.

No.	Question	Guidance	Answer Yes/No/N/a	Comments
		<ul style="list-style-type: none"> <li>• Fuels and oils, pesticides, disinfectants</li> <li>• Feedstuffs – spillages and dust from milled products</li> <li>• Pressure washing areas can also be sources of contaminated water.</li> </ul>		
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.	N/a	
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	Yes	

No.	Question	Guidance	Answer Yes/No/N/a	Comments
		minimised by bunding stores, kerbing muck pads, installing sleeping policeman in muck passage doorways etc.		

**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	N/a
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	N/a
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	✓