

# **SURFACE WATER DRAINAGE STRATEGY REPORT**

**Proposed Development:** Change of use of existing agricultural building to a single dwelling house

**Site Address:** Pendleton Road, Wiswell, Clitheroe, Lancashire, BB7 9BZ (Adjacent to 1 Tithe Barn)

**Applicant:** Thomas McSorley

**Date:** 30th January 2026

**Prepared by:** Thomas McSorley

## ***1. Introduction***

This Surface Water Drainage Strategy supports a full planning application for the change of use of an existing agricultural building to a single dwelling house at the above site.

The strategy demonstrates compliance with:

- **National Planning Policy Framework (NPPF, December 2024)** paragraphs 167–169
- **Planning Practice Guidance** on flood risk and sustainable drainage
- **DEFRA National Standards for Sustainable Drainage Systems (updated July 2025)**
- Lancashire County Council Lead Local Flood Authority (LLFA) expectations
- Ribble Valley Borough Council validation requirements (Adopted Validation Checklist, May 2025)

The proposal is minor development (single dwelling conversion) with very low surface water flood risk, as confirmed by Environment Agency Long Term Flood Risk mapping, Flood Map for Planning, and site assessment (see **Appendix A**).

## 2. Site Description and Existing Conditions

**Location and context:** Rural site on elevated ground (~144–145 m AOD) in Wiswell, Ribble Valley. Adjacent to residential properties (including 1 Tithe Barn). An ordinary watercourse (brook) is present on the land approximately 200 m from the agricultural building; no watercourse immediately adjacent to the building. The site is distant from main sections of Wiswell Brook (which has known historical issues downstream in Whalley village).

**Current use:** Agricultural building (barn) with no formal drainage—rainwater discharges directly overland or to field edges/ditches, potentially contributing to the on-site brook.

**Existing impermeable area:** Approximately 80 m<sup>2</sup> roof (low run-off contribution due to current agricultural use).

**Flood risk:** Very low surface water, fluvial, groundwater, and reservoir flood risk (per site assessment, EA Long Term Flood Risk summary, and Flood Map for Planning). The site lies outside Flood Zones 2 and 3 (see **Appendix A**).

**Soil and geology:** Heavy clay / glacial till typical of the Ribble Valley (solid clay ~400 mm beneath turf). Infiltration rates expected to be very low ( $< 1 \times 10^{-6}$  m/s, effectively impermeable for practical purposes).

**Existing drainage:** No formal system; overland flow following natural topography and field drains.

## 3. Proposed Development

- Conversion of the agricultural building to one dwelling house.
- Additional impermeable areas: Roof remains ~80 m<sup>2</sup> (0.008 ha, non-permeable); minor additional hardstanding ~50 m<sup>2</sup> (0.005 ha, e.g., parking/driveway to use permeable surfaces such as gravel or permeable block paving where possible). Total post-development contributing impermeable area ~0.015 ha (including +10% urban creep allowance per SuDS guidance).
- No significant increase in site levels or major earthworks anticipated.

- Foul drainage separate (package sewage treatment plant — see Drawing – Foul Water Drainage Strategy)

#### 4. Foul Water Drainage

The proposed single dwelling will generate domestic foul sewage from typical household use (toilets, bathrooms, kitchen, etc.). Foul flows are estimated at a low volume for one property (approximately 0.5–1.0 m<sup>3</sup>/day, based on standard domestic calculations for 4–6 population equivalent using British Water Flows & Loads guidance and GOV.UK sewage discharge calculator; well below General Binding Rules thresholds).

Foul water will be managed separately from surface water runoff, with no cross-connection, in accordance with Building Regulations Approved Document H (foul drainage and sanitary provision) and the national foul drainage hierarchy (as required by Ribble Valley Borough Council's Adopted Validation Checklist, May 2025). The hierarchy has been applied and options discounted as follows:

1. **Connection to public foul sewer** — Discounted. Site assessment and checks with United Utilities confirm no public foul sewer is available within reasonable distance or practicable cost (rural location; no nearby mains infrastructure serving adjacent properties such as Tithe Barn Cottages).
2. **Package sewage treatment plant** — Proposed solution. A small package sewage treatment plant (to BS EN 12566-3 standard, e.g., 6–8 person rated unit such as Klargester BioDisc or equivalent) will be installed within the site curtilage. This provides biological/aerobic treatment to produce high-quality effluent suitable for controlled discharge. Discharge will be to a nearby ditch or ordinary watercourse (approximately 200 m from the building, subject to minimum 10 m buffer and ensuring year-round flow), in compliance with Environment Agency General Binding Rules for small sewage discharges to surface water (<5 m<sup>3</sup>/day, domestic only, no pollution risk, partial drainage field if required for dry periods). The plant will be located away from habitable buildings, boundaries, wells, and the watercourse (minimum separations per rules), with easy access for desludging (every 6–12 months) and annual maintenance by a competent engineer.
3. **Septic tank** — Discounted. Heavy clay/glacial till soils (infiltration rates <1 × 10<sup>-6</sup> m/s, effectively impermeable) preclude effective percolation for a drainage field/soak away (per BS 6297:2007), increasing risks of failure, backups, or pollution. Direct discharge to watercourse is prohibited under General Binding Rules (since 2020 updates, unchanged in 2025–2026).

4. **Cesspool** — Discounted (unsuitable for permanent residential dwellings due to frequent emptying requirements and higher environmental risks).

The proposed system will comply with:

- Environment Agency General Binding Rules for small sewage discharges (no environmental permit required if all conditions met: domestic sewage only, <5 m<sup>3</sup>/day to surface water, regular maintenance, no pollution, competent installation).
- Building Regulations Part H (detailed design, pipe gradients, traps, ventilation, etc., to be approved at Building Control stage post-planning).
- No anticipated increase in flood risk or pollution (very low existing surface/fluvial/groundwater flood risk per Environment Agency Flood Map for Planning and Long Term Flood Risk summary; foul flows minimal and treated to high standard).

#### **4. Drainage Hierarchy Assessment**

The proposal follows the **mandatory national drainage hierarchy** (NPPF / DEFRA 2025) National Standards), prioritising a natural approach to managing surface water:

1. **Collection for non-potable use** (e.g., rainwater harvesting) — Considered but discounted. For a single dwelling conversion, there is no significant non-potable demand (e.g., garden irrigation minimal); implementation would add disproportionate complexity and cost relative to the minor scale of development.
2. **Infiltration into the ground** — Discounted. Solid clay soils prevent viable infiltration.

**Justification:** Site observations show heavy clay/glacial till immediately beneath the turf layer, with no visible free-draining horizons. Regional precedents in Ribble Valley rural conversions frequently discount infiltration on similar soils (WRAP soil type 4, SPR 0.47). Clay soils typically exhibit infiltration rates below  $1 \times 10^{-6}$  m/s (effectively impermeable per BRE Digest 365 and CIRIA SuDS Manual). BRE Digest 365 requires half-empty within 24 hours; in clay, trial pits show negligible drainage. No BRE365 infiltration tests undertaken at this stage due to clear visual/regional evidence and the minor scale of development. **Should the LLFA or Ribble Valley Borough Council require confirmatory testing, trial pits can be excavated and**

**tested in accordance with BRE Digest 365 procedures.** Infiltration is not reasonably practicable.

3. **Discharge to a surface water body** — Preferred and proposed option. Controlled discharge to the on-site ordinary watercourse (brook) at pre-development/greenfield rates. If the outfall requires any works in, on, under or over the watercourse (e.g. new headwall, pipe outfall, or bank protection), **Ordinary Watercourse Consent will be sought from Lancashire County Council LLFA** prior to commencement (Section 23, Land Drainage Act 1991). A simple pipe to an existing natural discharge point is anticipated, potentially avoiding consent.
4. Discharge to surface water sewer/highway drain — Not applicable (no public surface sewer nearby).
5. Connection to combined sewer — Last resort and avoided.

## **5. Proposed Drainage Strategy**

- **Approach:** Attenuation with restricted outflow to mimic pre-development (greenfield) runoff rates and volumes — ensuring no increase in peak flows or volumes for the 1 in 100-year + 40% climate change event.
- **Key components:**
  - Roof rainwater (~80 m<sup>2</sup>) collected via gutters/downpipes to below-ground attenuation storage (e.g. geocellular crates, modular tanks, or oversized pipes).
  - Hard standing (~50 m<sup>2</sup>): Permeable paving or gravel to promote interception and evaporation (first 5 mm rainfall managed on-site per DEFRA standards).
  - **Attenuation:** Below-ground storage (calculated 6.0 m<sup>3</sup> for 1 in 100-year event — see **Appendix Y**).
  - **Flow control:** Vortex restrictor, orifice plate, or hydrobrake limiting outflow to greenfield rate (~1.2 l/s total, with minimum 1 l/s to prevent blockage; 20 mm orifice).

- **Discharge point:** Controlled release to the on-site brook ~200 m from the building (via piped outfall or natural swale if feasible; no increase in flood risk or pollution).
- **Treatment train:** Basic — roof/hard standing runoff is low-pollution; optional small filter strip, forebay, or sediment trap at outfall if required by LLFA (per CIRIA simple index approach).
- No large ponds or extensive above-ground SuDS features required due to the minor scale and very low risk.

## 6. Hydraulic Calculations

- **Pre-development runoff:** Greenfield equivalent using **IH124 method** (UK SuDS tool, **Appendix B**). Site area 0.5 ha; SAAR 1162 mm; SPR 0.47 (WRAP 4); Hydrological Region 10.  $Q_{bar} \sim 4.4$  l/s ( $\sim 8.8$  l/s/ha). For minor development, a conservative default of 3 l/s/ha applied to adjusted catchment (0.415 ha) yields  $\sim 1.2$  l/s design flow (practical minimum for small sites to avoid blockage).
- **Post-development:** Restricted to pre-development rate ( $\sim 1.2$  l/s); no increase in peak rates or volumes.
- **Storage volume:** Sized for critical duration 1 in 100-year + 40% climate change storm (calculated  $6.0 \text{ m}^3$  for  $\sim 0.015$  ha contributing area on clay with restricted discharge; half-empty within 24–48 hours via restricted outfall). See **Appendix Y** for full UK SuDS tool outputs (FEH22 rainfall, model version 2.2.2).
- **Tools/outputs:** Detailed calculations via UK SuDS tools attached as **Appendices B and Y**.
- **Water quality:** Low pollution risk (CIRIA simple index approach); roof/hard standing runoff clean; treated via permeable surfacing and basic train.

## 7. Maintenance and Adoption

- **Responsibility:** Private (homeowner).
- **Schedule:** (Detailed Operation & Maintenance plan in **Appendix C**)

<b>Component</b>	<b>Frequency</b>	<b>Tasks</b>
Permeable Surfaces	Annual	Sweep to maintain permeability.
Gutters/downpipes	Annual	Inspect and clear debris.
Attenuation storage	Every 3–5 years	Inspect, desilt if needed.
Flow restrictor/orifice	Annual	Inspect for blockage, clean.
Permeable surfaces	Annual	Sweep to maintain permeability.
Outfall/filter strip	As needed	Vegetation management, remove sediment.

- No adoption sought (minor private scheme).

## **8. Construction Phase**

- Temporary measures: Silt fences, traps, and pollution prevention to protect the on-site brook (in line with PPG guidance).
- Phasing: Install permanent drainage early in construction.
- If Ordinary Watercourse Consent required, obtain prior to works affecting the brook.

## **9. Conclusions**

The proposed strategy follows the **national drainage hierarchy** and DEFRA 2025 National Standards, discounts infiltration due to impermeable clay soils, and ensures no increase in flood risk through attenuation and controlled discharge to the on-site ordinary watercourse at greenfield rates (~1.2 l/s).

It complies with national policy (NPPF), DEFRA standards, Lancashire LLFA expectations, and Ribble Valley Borough Council requirements for minor development in a very low flood risk area (see **Appendix A**). Storage is sized at 6.0 m<sup>3</sup> for the 1 in 100-year + 40% climate change event (Appendices B and Y). Ordinary Watercourse Consent will be confirmed or applied for if the outfall design requires it.

The proposals represent sustainable drainage appropriate to the scale and location of the development.

## ***Appendices***

- **Appendix A:** Environment Agency Long Term Flood Risk Summary and Flood Map for Planning screenshot (very low risk confirmed).
- **Appendix B:** UK SuDS Greenfield Runoff Rate Estimation (IH124 outputs).
- **Appendix C:** Operation & Maintenance Plan
- **Appendix Y:** UK SuDS Surface Water Storage Volume Estimation (6.0 m<sup>3</sup> for 1:100 + CC).