Annex XIII: Humanure Composting System

1. Introduction

This annex has been prepared in support of a planning application relating to Oak Court Farm, (adjacent to Vron Farm), Llewelyn Road, Vron, Tanyfron, Wrexham.

The purpose of this annex is to describe the humanure composting system currently operating on the holding and to explain the management approach adopted by the applicants as part of the site's wider foul drainage arrangements.

The system forms part of the low-impact and low-volume foul drainage approach described within the Drainage Statement and has been operating in practice throughout the applicants' occupation of the holding.

Humanure composting is a recognised compost-based sanitation system which treats human excreta as an organic resource capable of being safely composted through controlled biological processes. The approach adopted at Oak Court Farm has been informed by the principles described within The Humanure Handbook (4th Edition) by Joseph Jenkins, adapted as appropriate to the operational circumstances of the holding.

The applicants' approach has developed over time in response to practical experience, routine monitoring, observed system performance, and site-specific conditions. As a result, the current management arrangements reflect both established humanure composting principles and operational experience gained through the practical use of the system on the holding.

Operational monitoring records, temperature data, photographic evidence, and management records associated with the system are provided separately at Annex XIV.

2. Humanure Composting Principles

Humanure composting is a compost-based sanitation system in which human excreta is collected and subsequently composted within a managed biological process rather than being discharged to a sewer network or septic system.

The approach is based upon the principle that human excreta, together with suitable carbon-rich organic materials, can be safely transformed into stable compost through the activity of naturally occurring microorganisms. During the composting process, microorganisms break down organic matter, generate heat, and contribute to the gradual destruction of pathogens through a combination of biological activity, temperature, competition, predation, and retention time.

The approach adopted at Oak Court Farm has been informed by the principles described within The Humanure Handbook (4th Edition) by Joseph Jenkins. While operational practices may vary between individual systems, the key principles remain consistent:

- collection of human excreta within a dedicated collection system;
- transfer of collected material to a designated composting area;
- incorporation of suitable carbon-rich materials to support the composting process;
- maintenance of aerobic composting conditions through appropriate management; and
- provision of sufficient retention time to allow continued biological activity, decomposition, and pathogen reduction.

The objective of the process is not simply the storage of material, but its transformation through a managed composting process into stable organic matter over time.

The effectiveness of humanure composting depends upon appropriate system design, active management, ongoing monitoring, and adequate maturation periods. The applicants' operational approach incorporates each of these elements and has been developed through practical experience gained during operation of the system at Oak Court Farm.

3. Humanure Composting System at Oak Court Farm

The humanure composting system operating at Oak Court Farm has been developed as a practical, low-impact sanitation arrangement appropriate to the scale, temporary nature, and rural context of the holding.

Human excreta is initially collected within dedicated collection buckets located within the applicants' sanitation facilities. Toilet paper and kitchen paper are deposited into the collection system as part of normal use, together with occasional kitchen scraps. During the early stages of operation, a range of additional cover materials were also trialled, including straw, cardboard, sawdust, wood pellets, grass clippings, and wood ash. Operational experience subsequently demonstrated that equivalent outcomes could be achieved through increased management of carbon-rich materials within the composting bay itself, reducing the need for routine application of additional cover materials during the collection stage, which had proven comparatively labour-intensive in practice.

When collection buckets become full, their contents are transferred to the designated humanure composting area. The composting area is situated behind the central hedgerow separating the two principal fields of the holding and forms part of a dedicated and actively managed composting system.

The composting bay is constructed using pallet-based containment, thickly lined with straw, and incorporates substantial quantities of carbon-rich organic material, principally straw. Following each deposit, fresh material is covered with additional straw in order to maintain appropriate composting conditions, suppress odours, discourage pest activity, and support the biological processes responsible for decomposition.

The composting area is protected from significant disturbance through the use of mesh coverings and routine site management. The applicants have maintained appropriate moisture levels through active management where required.

The system includes dedicated areas for the storage of cover materials and associated operational equipment. Rainwater harvested on site is used for cleaning collection buckets and supporting moisture management within the composting system where necessary.

The applicants currently operate Humanure Bay #1 and have prepared Humanure Bay #2 as part of a planned rotational management approach. This arrangement will allow the first bay to remain undisturbed during its maturation period once the second bay enters active use.

The system forms part of a wider operational approach which treats humanure composting as an actively managed biological process rather than a passive waste storage arrangement. Routine monitoring, temperature recording, condition assessment, and management interventions are undertaken as required to support the continued operation of the system.

4. Management Approach

The humanure composting system at Oak Court Farm is operated as an actively managed biological process rather than a passive storage system.

The applicants undertake routine monitoring of the composting bay in order to observe system performance, identify any developing issues, and determine whether management interventions are required. Monitoring activities include condition assessment, temperature recording, capacity observations, odour assessment, observations of biological activity, and identification of any evidence of pest or animal disturbance.

Management interventions are undertaken where appropriate in response to observed site conditions. During the establishment and early operational phases of the system, this included adjustment of carbon-rich cover materials, refinement of operational practices, protection against animal disturbance, and periodic aeration of the composting material where monitoring indicated that intervention would be beneficial.

The applicants' management approach has evolved over time in response to practical operational experience and observed system performance. This adaptive approach has enabled the system to be refined and optimised while remaining consistent with the underlying principles of humanure composting.

Monitoring records demonstrate continued biological activity throughout the monitoring period, including temperature generation, visible decomposition, fungal activity, steam generation, progressive volume reduction, and the ongoing breakdown of organic material within the composting bay.

The monitoring evidence also demonstrates a transition from the establishment phase of the system, where more frequent observation and occasional intervention were required, towards a mature operational phase characterised by routine monitoring and stable performance.

Examples of monitoring records, management interventions, temperature data, capacity observations, and photographic evidence are provided at Annex XIV.

5. Environmental Safeguards

The humanure composting system forms part of a controlled and actively managed operational arrangement designed to minimise environmental risk and avoid adverse effects upon neighbouring land, residential receptors, and the surrounding water environment.

The composting area is positioned approximately 140 metres from the adjacent river corridor and approximately 30 metres from the nearest neighbouring garden, providing substantial physical separation from both sensitive water environments and neighbouring residential receptors. The site layout incorporates significant intervening ground, vegetation, and natural filtration pathways between the composting areas and the wider catchment associated with the River Dee and Bala Lake Special Area of Conservation (SAC).

The applicants' management approach incorporates the use of carbon-rich cover materials, routine monitoring, active site management, and protection against animal disturbance. These measures assist in maintaining appropriate composting conditions while minimising odour, pest attraction, and unnecessary environmental disturbance.

The composting process itself incorporates substantial retention periods. Humanure Bay #1 has been operated as part of a planned rotation system, with Humanure Bay #2 prepared to facilitate the transfer of active inputs once required. This arrangement will allow the first bay to remain undisturbed during an extended maturation period prior to any future use of the resulting compost material.

The applicants also undertake ongoing monitoring of system performance, including condition assessment, temperature recording, capacity observations, and identification of any issues requiring intervention. This monitoring regime supports the continued effective operation of the system and allows management practices to be adapted where appropriate.

Operational monitoring undertaken throughout the monitoring period has demonstrated the absence of significant odour issues, significant pest issues, or significant environmental impacts associated with the operation of the system. Further detail is provided at Annex XIV.

6. Capacity & Rotation Strategy

The humanure composting system at Oak Court Farm has been designed and managed as a rotational system incorporating multiple composting bays.

Humanure Bay #1 was established in July 2025 and has remained in active use throughout the monitoring period. Operational monitoring records demonstrate that the bay has successfully accommodated and processed approximately one year of humanure inputs arising from occupation by four adult residents while maintaining operational functionality, ongoing decomposition, and residual capacity.

The applicants have prepared Humanure Bay #2 to facilitate the planned transfer of active inputs once Humanure Bay #1 reaches operational capacity. This arrangement forms part of the intended long-term management approach for the system.

The rotational approach allows each composting bay to remain undisturbed during an extended maturation period following active use. This retention period supports the continued biological processes responsible for decomposition and pathogen reduction while allowing composted material to stabilise prior to any future use.

The capacity demonstrated by Humanure Bay #1 throughout the monitoring period provides practical evidence that the system is capable of accommodating the sanitation requirements associated with the scale of occupation proposed. Monitoring records indicate that the current system remains operationally effective and that the planned rotational approach can be implemented without interruption to the ongoing management of the site.

Further evidence relating to capacity observations, monitoring records, and operational performance is provided at Annex XIV.

7. Relationship to Sustainability Objectives

The humanure composting system forms part of the applicants' wider low-impact and stewardship-led approach to the management of Oak Court Farm.

The system operates without the use of water for flushing and avoids the need for extensive foul drainage infrastructure. In doing so, it provides a sanitation solution appropriate to the rural context, temporary nature, and scale of the proposal.

The approach also supports the recovery of organic nutrients through a managed biological process rather than treating human excreta as a waste product requiring disposal. This reflects the applicants' broader operational philosophy of seeking, where reasonably practicable, to retain, reuse, and derive value from organic resources generated on the holding.

The applicants recognise that the effectiveness of such an approach depends upon appropriate management, monitoring, and retention periods. Accordingly, the system is operated as an actively managed biological process rather than a passive waste storage arrangement, with ongoing monitoring and management forming an integral part of the operational approach.

The humanure composting system therefore forms one element of a wider operational strategy which seeks to integrate productive land use, environmental stewardship, resource efficiency, and low-impact rural living within the context of a developing rural enterprise.

8. Conclusion

This annex demonstrates that the humanure composting system operating at Oak Court Farm forms part of a practical, low-impact, and actively managed foul drainage arrangement appropriate to the scale, temporary nature, and rural context of the proposal.

The system has been developed in accordance with established humanure composting principles and refined through practical operational experience gained during occupation of the holding. The applicants' approach incorporates routine monitoring, active management, capacity planning, environmental safeguards, and a rotational management strategy designed to support the continued effective operation of the system.

Operational evidence collected throughout the monitoring period demonstrates ongoing biological activity, continued decomposition, successful system management, and the absence of significant operational or environmental issues. The evidence also demonstrates that a single composting bay has successfully accommodated approximately one year of humanure inputs arising from occupation by four adult residents while maintaining operational functionality, ongoing decomposition, and residual capacity.

The applicants also note that Natural Resources Wales, in its consultation response dated 10 November 2025, advised that the proposal could reasonably be screened out as not likely to have a significant effect upon the River Dee and Bala Lake SAC in relation to nutrient inputs. While that consultation response was necessarily based upon the information available at that time, the applicants now also have the benefit of approximately one year of operational monitoring and management evidence demonstrating the practical operation of the system in situ.

The applicants consider that the humanure composting system provides a practical, proportionate, and environmentally responsible sanitation solution consistent with the low-impact operational approach adopted across the wider holding.

Further operational evidence, including monitoring records, temperature data, management interventions, capacity observations, and photographic records, is provided at Annex XIV.