

BML Response to LLFA Comments

Project	Kirkby BESS, Coopers Lane, Kirkby, L33 7TT.	Date	04.02.2026
Note	BML response to LLFA technical queries related to Drainage Strategy	Ref	1126-01 TN002-Rv010
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The Lead Local Flood Authority (LLFA) team at Knowsley Council issued a letter dated 15th January 2026 outlining their comments/queries related to the full Planning Application. Refer to **Appendix A** for the LLFA consultation response.

List of Planning Objections and BML Responses:

1. Maximum discharge rate from site should be restricted to QBAR greenfield runoff rate. As the Knowsley Brook will be culverted further downstream to the proposed connection point (discharge point) and also the fact that the Brook is at the risk of surface water flooding downstream of the connection point, the LLFA is concerned that the additional discharge to the Brook increases the likelihood of flooding/siltation there. Particularly in this case that further downstream of the connection point Brook passes through an urban area. There is a range of discharge control devices that are able to restrict the discharge rate to even less than 1 l/s.

BML Response:

The proposed discharge rate of 5 l/s has been carefully considered in the context of site constraints, operational risk and downstream flood risk and is considered to represent a safe, proportionate and justified departure from the QBAR greenfield rate of 1.2 l/s for the reasons set out below.

a) Operational Risk Associated with Ultra-Low Flow Controls at an Unmanned BESS Site

The site will operate as an unmanned Battery Energy Storage System (BESS) facility. As such, the use of flow control devices restricting discharge to circa 1 l/s presents a material operational and flood risk. Flow control devices operating at very low discharge rates are inherently more susceptible to:

- blockage from silt, debris, biofilm growth and sediment build-up; and
- reduced hydraulic reliability over the lifetime of the development.

In the event of partial or full blockage at a 1–1.2 l/s restriction, surface water runoff would rapidly surcharge and flood the site, with no on-site personnel available to identify and resolve the issue in real time. This introduces an unacceptable risk to:

- critical electrical infrastructure (battery units and associated furniture)
- emergency access routes
- site safety

A 5 l/s discharge provides a more hydraulically resilient solution, significantly reducing the likelihood and consequence of blockage while still ensuring a controlled and attenuated discharge regime.

b) Severe Site Constraints and Multi-Functional Storage Provision

The site is heavily constrained in terms of available land, with no realistic opportunity to provide additional surface water attenuation beyond that already proposed.

Key constraints include:

- extensive underground cabling associated with the battery units
- internal access roads required for emergency and maintenance access
- exclusion zones where attenuation infrastructure would be incompatible with operational or safety requirements

A large below-ground tank is therefore proposed at the only viable location on site. This tank has been designed to:

- attenuate surface water runoff from rainfall events up to and including 1 in 100 year + 40% climate change (CC) event; and
- provide emergency containment capacity for fire-fighting water, should such an event occur as per EA requirement.

Reducing the discharge rate further to QBAR would necessitate additional storage volume, which cannot be accommodated within the site footprint without compromising critical infrastructure or site safety. The proposed arrangement therefore represents the maximum achievable level of attenuation within the physical constraints of the site.

c) Demonstrated Control of Discharge Across All Storm Events

Hydraulic modelling has been undertaken for all relevant storm events up to and including the 1 in 100 year + 40% CC event. The results demonstrate that the site does not continuously discharge at 5 l/s, and that the actual outflow is typically well below this upper limit.

The modelled peak outflows are summarised below:

- 1 in 1 year + 0%CC storm event: 3.8 l/s
- 1 in 2 year + 0%CC storm event: 4.0 l/s
- 1 in 30 year + 40% CC storm event: 4.9 l/s
- 1 in 100 year + 40% CC storm event: 4.9 l/s

(Refer to **Appendix D** – Drainage Calculations)

These results confirm that:

- for frequent and intermediate storm events, discharge rates are significantly below 5 l/s; and
- even during extreme rainfall events, discharge is capped and controlled, preventing sudden or uncontrolled increases in flow to Knowsley Brook.

As a result, the proposed drainage strategy does not increase downstream flood risk or exacerbate siltation issues within the culverted and urban reaches of the Brook.

Therefore, the proposed discharge rate represents a balanced solution that:

- limits runoff to a tightly controlled and modelled rate
- avoids creating a high-risk, blockage-prone system at an unmanned site
- maximises attenuation within severe spatial constraints
- ensures no material increase in downstream flood risk.

In this context, a rigid adherence to QBAR is neither practical nor safer, and the proposed 5l/s cap is considered the most robust and resilient drainage solution for the site.

2. No details of the device/structure at the connection point (including the type of outlet and invert level) were provided. The invert level of the device should be determined using the maximum water level preferably using the 1 in 100 years water level event.

BML Response:

A DN225 Althon outlet headwall is proposed at the top of the brook bank to discharge surface water from the site. The outlet invert is set at 37.500 m AOD, which is above the average water level and provides a conservative freeboard (600mm above average water level) relative to the banked flow shown on the EA Flood Map for Planning. The EA mapping indicates that flooding in the brook during the 1 in 100 year event is contained within the brook banks, and the proposed outlet position ensures controlled discharge without risk of submergence under typical flood conditions. A non-return valve is also proposed to prevent backflow from the brook during elevated water levels.

Full details of the outlet type, location and levels are provided on drawings KIRK-BML-XX-XX-DR-C-0501 and 0511 in **Appendix B**.

3. At the normal condition, the proposed SuDS and drainage features to collect and convey the surface water runoff to the attenuation pond is acceptable. However, the size of attenuation tank given the maximum discharge rate of 1 l/s should be enlarged/amended.

BML Response:

Please refer to BML response to **(1)** above.

4. In the event of a fire, the LLFA advocates the proposed methodology for fire water management subject to satisfy the Environment Agency's concerns as reflected in their consultation letter dated 07 Nov 2025. The methodology is to contain any fire water runoff from the batteries directly in the position of the battery units using concrete apron bunds. However, further information/details will be required to ensure the adequacy of the attenuation tank for the volume of fire water and surface runoff volume during an extreme event. To specific, (i) there remains insufficient details regarding the ability of the proposed drainage features to contain potentially chemically aggressive and hot fire water, which is a critical consideration given the nature of the site risk and (ii) the proposal includes attenuation crates wrapped in a geotextile membrane, but there is no clear explanation of how this arrangement would form a watertight tank capable of containing contaminated runoff.

BML Response:

We have consulted EA regarding the fire water management on site and EA has approved our fire water management strategy as mentioned in the EA letter ref: ENVPAC_1_GMC_00628 dated 13th January 2026 (attached to **Appendix C**).

Further, we have attached BML technical note on fire water management addressing all EA concerns which has been approved by EA in the **Appendix C**. Both the queries (i) and (ii) mentioned above have also been addressed along with the other concerns in this document.

5. Demonstrating that adequate water quality of the off-site surface water flows (draining into a watercourse) in accordance with the Simplified Index Approach as set out within Section 26 of the SUDS Manual (C753) can be achieved during all phases of the development shall be expected.

BML Response:

All surface water discharging into the watercourse from the site has been checked against the simple index method to ensure that the pollution mitigation index for each contaminant type exceeds the pollution hazard index, refer to Section 3.5 of the Drainage Strategy Report ref: KIRK-BML-XX-XX-RP-C-0512 (attached to **Appendix G**)

6. Compliance with the above amendments, Model Information (Micro Drainage or similar approved) to include a plan showing pipework model numbering and network details. Results showing all the modelling criteria and summary network results for critical 1 in 2 years, 1 in 30 years and 1 in 100 years plus 40% CC storm events showing maximum water level, flow and velocity and details of any surface flooding anticipated will be required.

BML Response:

Please refer **Appendix D** containing InfoDrainage Model Plan Layout ref: KIRK-BML-XX-XX-SK-C-0501 along with InfoDrainage SIM files, drainage calculations exports for 1 in 1 year, 1 in 2 year, 1 in 30 year + 40%CC and 1 in 100 year + 40%CC storm events.

7. Compliance with the above amendments, a detailed design of proposed drainage system will be required, showing drainage layout, manholes including cover and invert levels, proposed levels, pipe sizes and gradients, all on -line controls, on and off line storage structures and outfall details considering the points raised in this consultation and concerns raised by the UU and EA.

BML Response:

Drainage plan layout, stormwater chamber and pipe schedules and drainage details drawings updated as per UU and EA concerns are attached to **Appendix E**.

8. Plan showing overland exceedance routes and flood depth in the event of a failure of the drainage system. The failure of the proposed system should include blockage of pipes, blockage of outlet structures and risk of impediments across planned flood routing paths. This could be supported by a designer's risk assessment that identifies key points of failure of the system and what means/mitigations have been adopted to limit risk of failure. This will also inform the maintenance plan with regards to corrective actions needed should a failure occur.

BML Response:

No flooding is predicted on site for storm events up to and including the 1 in 100 year + 40% CC event, as demonstrated by the drainage modelling provided in **Appendix D**. To assess site performance under more extreme rainfall conditions, the drainage model was extended to the 1 in 1000 year + 0% CC event, which also confirms no on-site flooding (refer to drainage calculations in **Appendix F**).

When the model was run for the 1 in 1000 year + 40% CC event, very limited and localised flooding was identified at the south-western and western corners of the site from 2 manholes which are positioned near the site boundary away from battery units, as shown on the Flood Flow Analysis drawing KIRK-BML-XX-XX-DR-C-0550 (attached to **Appendix F**). However, the proposed site contours ensure that any exceedance flows are directed towards low-risk areas, allowing runoff to be conveyed away from the battery units and other critical infrastructure, and towards the adjacent green areas in the direction of Knowsley Brook. As a result, the predicted exceedance flooding does not impact the battery units or any other critical infrastructure.

Further details, including the flood flow analysis layout, site-generated flood risk assessment, InfoDrainage simulation files and drainage calculations are provided in **Appendix F**. Operations & Maintenance Manual for SuDS & drainage components is attached to **Appendix G**.

9. Plan showing overland exceedance routes, ponding areas and flood depth, and extreme event exceedance management in the event of a storm event in excess of the 1 in 100 + 40%CC storm event shall be required.

BML Response:

Refer to **Appendix F** containing drawing ref: KIRK-BML-XX-XX-DR-C-0550 showing exceedance flow routes, ponding areas and flood depths for 1000 year + 40%CC storm event.

10. Compliance with the above amendments, a summary drainage report setting out the Drainage Strategy and results of the calculations shall be required.

BML Response:

Refer to **Appendix G** containing updated Drainage Strategy Report ref: KIRK-BML-XX-XX-RP-C-0512.

11. Compliance with the above amendments, a Management and Maintenance Plan for the sustainable drainage system relating to the lifetime of the development through an appropriate legally binding agreement shall be submitted to and approved in writing by the Local Planning Authority.

BML Response:

Refer to **Appendix G** containing Operations & Maintenance Manual ref: KIRK-BML-XX-XX-RP-C-0513.