

Reference: APP/25/00351

29th August 2025

Lesley Wells
Development Management
Havant Borough Council

Via email – Lesley.Wells@havant.gov.uk

Dear Lesley,

RE: Response to Portsmouth Water's Catchment management Team's comments for proposed Battery Energy Storage System (BESS) at Land at Portsmouth Water Bedhampton Water Treatment Works, Meyrick Road, Havant, PO9 3HB.

This letter has been provided in response to Portsmouth Water's (PW) comments of 27th June 2025 to the submission of planning application APP/25/00351, which seeks consent for a proposed Battery Energy Storage System (BESS) and associated works at Land at Portsmouth Water's Bedhampton Water Treatment Works, Meyrick Road, Havant, PO9 3HB.

The applicant has worked collaboratively with PW to ensure that a well-designed and acceptable scheme has been provided through this planning application, including at their request, moving both the red line boundary and the internal layout to address identified interface conflicts with the adjacent Havant Thicket Reservoir scheme.

The prescient issues raised by the PW comments are discussed below:

Design and Access

The site currently has landfill material stored on the proposed BESS' footprint, and there are two extant Environmental Permits associated with the landfill.

It has been discussed and agreed between Energy 101 and Portsmouth Water that the landfill material shall be removed to create a level site for the construction of the BESS. The proposed bund to the southern boundary of the site shall remain.

It is anticipated that PW shall undertake a programme of 'closure' and 'surrender' of the environmental permits. These activities are to be undertaken by PW outside of the planning regime and within the Environmental Permitting regime and accordingly is outside the scope of the application.

Drainage Strategy

Surface water runoff would be directed to the drainage system through drainage gullies located around the perimeter of the equipment and through contouring of the hardstanding areas. Landscaped areas should be incorporated into the layout where possible to allow a proportion of the rainfall to infiltrate into the soil substrate. Surface water will be directed to an onsite attenuation tank.

The geocellular attenuation tank will be designed to reduce runoff at the post development surface water runoff to calculated greenfield runoff rates, up to and including the 1 in 100-year (+45%CC) rainfall event.

The SuDS treatment, including attenuation tanks, will improve water quality. A conditioned maintenance and management plan shall ensure the effectiveness of the drainage strategy during the operation phase.

It is proposed as part of the drainage design that an automatic penstock valve is incorporated, which would be automatically engaged upon detection of any emergency event. The automated penstocks can be triggered by sensors, control systems, or remotely via GSM networks, providing efficient and responsive control of water flow to prevent flooding from rising water levels and automatically close to prevent contaminated water from entering the system or being discharged into the environment.

Bioretention systems primarily focus on treating stormwater through filtration, while gravel attenuation systems primarily focus on storing and controlling the release of water. These should be incorporated into the layout where possible.

The proposed bioretention system works by runoff water ponding on the surface, then filtering through the vegetation and soil, and either infiltrating into the ground or is collected by an underdrain.

The gravel attenuation system is a subsurface feature that temporarily stores stormwater runoff in a gravel layer before releasing it at a controlled rate and consists of a gravel-filled trench or void beneath the surface. A flow control device regulates the rate at which the water is released, reducing peak flow rates and preventing overloading of drainage systems.

In combination, a bioretention system and gravel attenuation system will provide comprehensive water management, with the bioretention system treating runoff before it enters a gravel attenuation system which in turn will enter the attenuation tank.

Interceptors could be incorporated along the road network to improve water quality.

Fire Water shall be managed via a 'sealed system' approach, such that potentially contaminated runoff can be stored onsite through the use of an impermeable below ground tank to which any contaminated water from a fire incident would be directed using a penstock valve. The onsite attenuation has been

designed to accommodate the additional firewater storage. Potentially contaminated water will be tankered away for disposal.

Beyond the designed storage, additional capacity would be provided by the pipe network, chambers, and void space in the gravel sub-base and surrounding units before overtopping and uncontrolled overland flow would occur. Firewater would be tankered/recirculated away for disposal/treatment by a licensed operator, or after testing released in a controlled manner from the attenuation system.

Geo-environmental

The Hydrogeological Risk Assessment submitted to PW and the LPA shows the use of the site for a BESS to be a low risk to groundwater resources. We have concluded that with the design and implementation of mitigation measures to contain waters in the event of a fire, the identified potential impacts to the underlying aquifers.

Whilst PW considers a potential fire to be a significant risk to Bedhampton Springs the mitigation measures implemented within the design, during construction and following operation will prevent the release of potential contaminants in the event of a fire.

Furthermore, the net groundwater flow is upwards from the underlying chalk Principal Aquifer. Should any contamination present within the existing made ground or introduced as a consequence of site development or fire within the operational BESS, the risks of impact will be reduced to an acceptable level through the requirements of the Construction Environmental Management Plan and BESS mitigation measures. These would broadly include the following (as indicated in the HRA report):

- Use of construction activities and design to prevent contamination and impact to surface water, groundwater (including the chalk Principal Aquifer).
- Monitoring and containment systems during the operation of the BESS (HVAC, fire suppression, containerization of BESS and watertight bunding for each, including segregation of surface water).
- Drainage strategy to retain emergency response firewater within a sealed system.

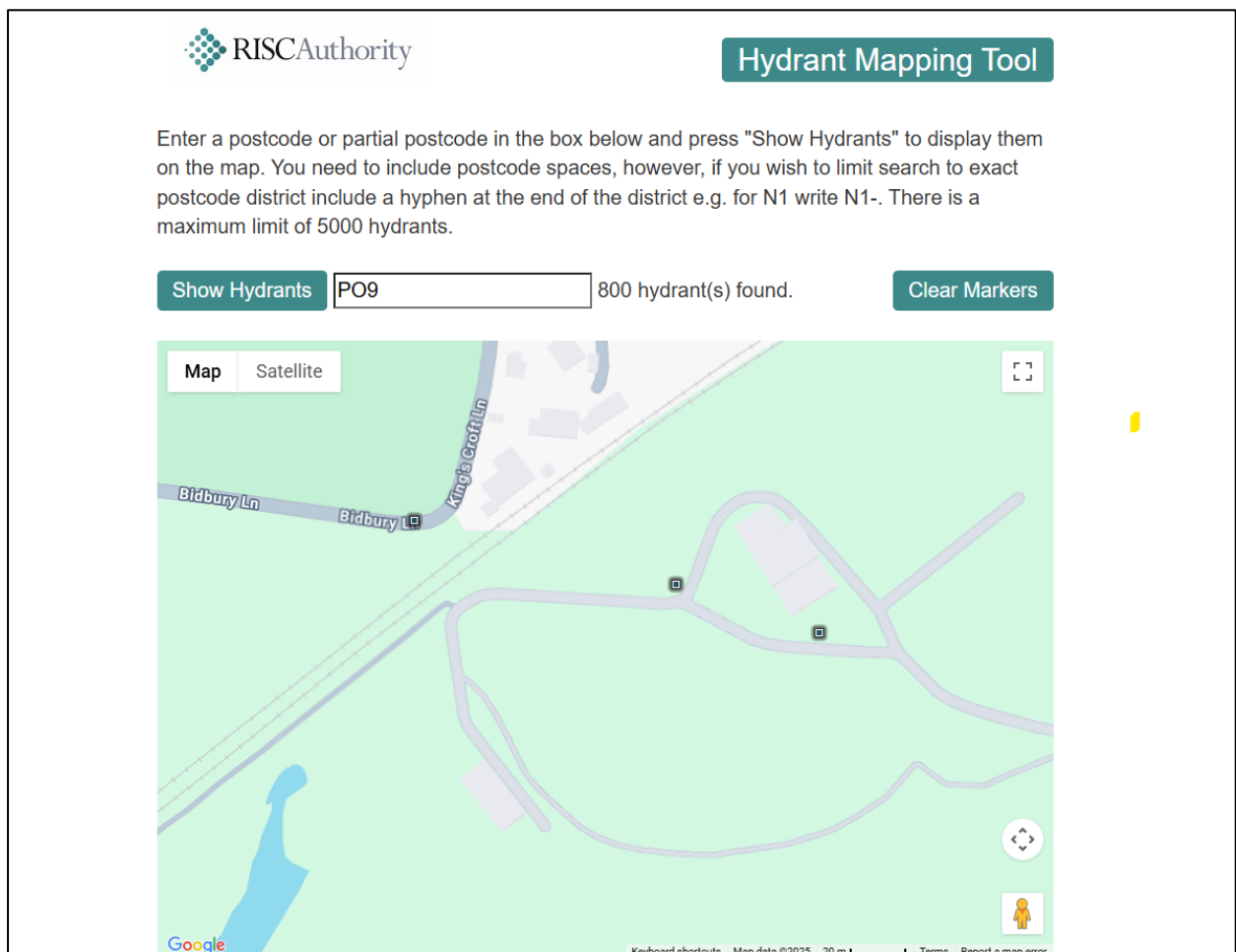
The submitted Preliminary Geoenvironmental Risk Assessment (PRA) states the site would be considered low sensitivity due to the nature of the Proposed Development. It is our consideration this is to be the case due to the inert nature of the existing fill materials and the low probability of contamination impacting surface water and groundwater providing the proposed mitigation measures are implemented.

The PRA does not provide details on the landfill material being stored at the site as it has been agreed between the applicant and PW that the inert material is to be removed in its entirety, with PW looking to surrender their Environmental Permits. The movement of the landfill material would be considered within a detailed Construction Environment Management Plan, secured via appropriate planning conditions attached to planning permission.

Water Supply

The National Fire Chiefs Council (NFCC) guidance (March 2023) guidance recommends that adequate water supplies are available to the FRS, suggesting the delivery of 1,900 litres per minute for at least 2 hours, which can either be provided by on-site water storage, or a suitable hydrant.

The RiscAuthority hydrant mapping tool demonstrates there to be two available water hydrants on the Portsmouth Water Pumping Station site, and accordingly are within and complaint to the NFCC guidance – see locations on plan below:



The application shall incorporate an underground water tank and a lined fire water runoff attenuation tank. The Battery Storage Units will be fitted with their own fire suppression systems providing further mitigation.

Whilst there shall be a sufficient quantity of water available onsite to be used to respond to any fire event, the proposed BESS shall have the latest safety measures incorporated – which are constantly improving as newer generations of BESS come to market – including both automatic monitoring and control to

respond to any incident, as well as 24/7 monitoring from an external control point, ensuring a double level of control.

Notwithstanding this, the safety of BESS installations is statistically significant, and it is quantifiable that should equipment not have been tested to and adhered to the stringent safety measures, presently the UL9540A Test Method – the primary fire safety standard, BESS sites would not secure the necessary insurance to operate and therefore would not be viable propositions.

UL9540A Unit-level testing indicates that no flaming occurred and that no heat propagation from an initiating unit to adjacent units / modules reached levels capable of initiating cell venting or thermal runaway.

Below is a summary of information on the proposed battery safety specifications and design that make any risk of fire highly unlikely at the site.

BESS Fire Test

In 2024, Sungrow conducted a large-scale fire test, simulating a 'real-world power plant fire' on its PowerTitan 2.0 energy storage system. The test involved a 25-hour burn, far exceeding the typical industry standard, and focused on demonstrating the system's fire safety features and ability to contain thermal runaway.

The test results showed that the system's fire mitigation technologies, such as explosion venting, flame retardancy, and impact resistance, were effective in preventing fire spread and ensuring the safety of adjacent units.

The results were clear: there was no fire propagation during the thermal runaway incident. In contrast to conventional industry burn tests, this test was a significant upgrade in terms of combustion duration, testing conditions, and safety standards, establishing a new benchmark for safety through rigorous and extreme testing.

The key aspects of the test were:

- **Prolonged Combustion:** The test involved a 25-hour and 43-minute burn, significantly longer than the typical 4-8 hour industry standard.
- **Thermal Runaway Containment:** The test aimed to demonstrate the system's ability to contain thermal runaway, a situation where a battery cell overheats and potentially causes a fire.

- **Fire Mitigation Features:** PowerTitan 2.0 utilises advanced explosion venting, flame retardancy, and impact resistance technologies to prevent fire spread.
- **No Fire Propagation:** Despite the prolonged and intense fire, the fire did not spread to adjacent units, and the affected container remained structurally intact.
- **Safe Removal:** Even after the 25-hour burn, the affected system remained safe for removal.
- **Adjacent Unit Stability:** The test demonstrated that neighboring units remained operational with stable voltages and a high state of charge.
- **Industry Benchmark:** The test results set a new safety benchmark for the energy storage industry, demonstrating the effectiveness of Sungrow's fire safety measure

Accordingly, the proposed Sungrow PowerTitan 2.0 battery energy storage system demonstrates exceptional fire safety, particularly in terms of thermal runaway containment and fire propagation, and as such, when coupled with the site's adherence to the NFCC guidance, it is considered that the BESS would have the highest safety standards possible, and should not be a reason to preclude planning permission.

Safer battery chemistry and design

LFP (Lithium Iron Phosphate) battery technology is characterised by its high thermal stability and stable electrolyte composition. It exhibits a higher onset temperature for thermal runaway, around 240°C. This means they are less likely to experience catastrophic failure under high-temperature conditions.

LFP batteries' overall design and chemistry contribute to a more stable system, further mitigating fire risks.

Intelligent liquid-cooled Temperature Control Method

The liquid cooling system ensures that both the PCS and battery modules within the container experience balanced heat dissipation, maintaining a low temperature difference between battery cells. Sungrow incorporates multiple safety measures, including cell-level monitoring, electrical safety features (like arc detection and short circuit protection), and container-level fire safety features.

97% Reduction in Failure Rates:

Between 2018 and 2023, the global failure rate for grid-scale BESS installations decreased by 97%. This decline is attributed to advancements in system design, enhanced safety standards, and improved operational practices, according to Electric Power Research Institute – link to study [Link](#)

Each BESS planning application is unique in terms of size, location, infrastructure, topography etc., and accordingly each proposal stands on its own merits. The fundamental principle of the planning system is that every application must be assessed on its merits, and this should be considered when assessing the proposed development.

I hope the above provides comfort that the applicant has acknowledged and addressed the issues raised by PW, however, should you require further information, please do not hesitate to contact me.

Yours sincerely,

Robert Gandy BA (Hons), MA, MRTPI

Principal Planning Consultant