

14th May 2026

The Catchment Management Team
Portsmouth Water

Dear Catchment Management Team,

Regarding: Response to Holding Objection – Proposed BESS at Bedhampton Pumping Station – Planning Application APP/25/00351

Following your holding objection regarding the proposed Battery Energy Storage System (BESS) at the Bedhampton Pumping Station, we submit the following technical mitigation as a response.

We recognise the site's critical sensitivity within a Source Protection Zone 1 (SPZ1) and the direct proximity to the Havant and Bedhampton springs.

To ensure the protection of the Chalk Aquifer, the development will move beyond standard best practice to zero-infiltration containment. This strategy is designed to ensure that no discernible concentrations of pollutants enter the groundwater.

The primary concern regarding firewater runoff will be addressed via a multi-layered impermeable barrier, with the top layer being a composite geomembrane, a 2.0mm High-Density Polyethylene (HDPE) liner, designed to be installed across the entire BESS footprint. All seams will be wedge-welded and pressure-tested to ensure a 100% liquid-tight seal.

The liner accords to industry standards such as American Society for Testing and Material (ASTM) International's ASTM D6693 and ASTM GRI-GM13 and demonstrates a high "Best Available Technique" (BAT) standard to the Environment Agency.

Due to its reinforced thickness and high safety margin, the 2.0mm variant is the standard choice for water management (e.g. large reservoirs, canals, and high-pressure dam structures) and industrial (e.g. secondary containment for oil storage tanks and chemical plants), and so is an ideal solution for containment at the BESS

site as directly addresses the site's critical environmental sensitivity as a primary drinking water source.

With a hydraulic conductivity of $<1 \times 10^{-13}$ cm/s, the liner ensures that any potential electrolyte leaks or firefighting runoff are captured before they can infiltrate the Source Protection Zone.

BESS units typically use lithium-ion chemistries. HDPE is highly resistant to the specific chemicals and solvents found in battery electrolytes, ensuring the barrier won't degrade if a spill occurs.

A 2.0mm liner is designed to last 30–50 years, matching the expected operational life of the energy storage facility.

Beneath the HDPE liner, a Geosynthetic Clay Liner (GCL) will provide a secondary barrier, offering a dual-redundancy system that prevents infiltration, even in the event of a mechanical puncture.

The GCL is a hydraulic barrier comprised of sodium bentonite encapsulated between geotextiles, primarily standardised by ASTM International, including ASTM D5887 (flux/permeability), ASTM D5888 (bentonite storage), and ASTM D5889 (quality control).

Recognising the specific risk to the Bedhampton springs during a thermal event, the site drainage has been engineered as a closed loop system.

The site is designed as a 'sealed tray' capable of retaining the total anticipated firewater volume for a 4-hour suppression event, as calculated per CIRIA C736 (Design of Containment Systems for the Prevention of Pollution), preventing it from entering the nearby Hermitage Stream or the spring network.

The surface water outfall will be equipped with failsafe automated shut-off valves linked to the Fire Detection and Battery Management System (BMS). Upon detection of heat or smoke, the site will self-isolate, preventing any discharge into the wider catchment.

All surface runoff will pass through high-efficiency separators to remove any hydrocarbons and particulates.

This robust mitigation ensures the proposal aligns with National Planning Policy Framework (NPPF) Paragraph 198, ensuring the development is appropriate for its location, taking into account the effects of pollution on the natural environment.

The implementation of a HDPE/GCL dual-layer membrane ensures that the BESS is a storage activity rather than a discharging activity, with Tertiary Containment as defined by CIRIA C736, which ensures the integrity of the SPZ1.

The proposed Geosynthetic Clay Liner (GCL) essentially acts as a secondary barrier that seals any potential pathways, maintaining the geological barrier.

The proposed design will provide a robust engineering solution that ensures no discharge of hazardous substances to the Chalk Aquifer.

By implementing a zero-infiltration design, the development prevents any new pollution pathways, thereby satisfying the requirements of the Groundwater (England and Wales) Regulations 2017.

We wish to clarify the fire management strategy is not intended to double the water volume through simultaneous use of tanks and hydrants in a way that exceeds containment capacity. The onsite water tanks (228,000 litres) are the primary dedicated source for the 1,900 litres per minute (lpm) requirement over 2 hours.

Access to a hydrant is a secondary, contingency measure as required by fire safety standards (NFCC). The drainage system is being designed to account for this 228,000-litre volume as the baseline for emergency containment.

The lined site refers to a fully impermeable high-density polyethylene (HDPE) or reinforced concrete containment bunding system. This construction will ensure that the BESS compound acts as a sealed bowl during any unlikely thermal runaway event.

We acknowledge the request for specific calculations. Detailed hydraulic modelling—incorporating the 228,000-litre firewater volume alongside a 1-in-100-year storm event (+40% climate change allowance)—is currently being finalised to demonstrate that no uncontrolled overtopping will occur. This shall be detailed in an updated Flood Risk Assessment.

While our earlier responses mentioned '*void space in gravel*', we clarify that this is supplemental. The primary containment is the impermeable below-ground tank and the raised kerb/bunding system of the compound itself.

We would like to reiterate that uncontrolled overland flow is not permitted in the BESS site design.

A penstock valve will be used to isolate the site drainage from the wider network immediately upon fire alarm activation.

We confirm that an active management plan will be in place. Once firewater is contained within the sealed system, it will be tested and removed via vacuum tanker

by a licensed waste carrier. No water will be released into the Hermitage Stream or allowed to infiltrate groundwater until it is verified as uncontaminated or treated.

The perceived contradiction regarding 'tankered away' versus 'attenuation storage' is a matter of sequencing.

The attenuation system provides the physical space to hold the water safely during any incident; with the tankering being the method of disposal for that captured water.

We agree, as suggested by you, to a pre-commencement planning condition requiring a Detailed Response Plan. This plan will be developed in consultation with Portsmouth Water and the Hampshire & Isle of Wight Fire and Rescue Service to ensure the protection of the public water supply at Bedhampton Springs.

We believe this engineering approach provides the necessary certainty to allow Portsmouth Water to withdraw its holding objection, but if you require any further information / clarity, please get back in contact.

Yours faithfully,

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