Preliminary Hazard Analysis Addendum

09 July 2025

To	Laura Wyatt		
Copy to	Simon Murphy		
From	Fiona Duncan	**Project No.**	12622176
Project Name	PON Battery import		
Subject	Preliminary Hazard Analysis Addendum		

Dear Laura

1. Introduction

GHD Pty Ltd (GHD) prepared the Preliminary Hazard Analysis Battery Import Project (2024) (PHA) to assess hazards associated with the storage of battery energy storage systems (BESS) at the Mayfield General Cargo Storage Facility. The Department of Planning, Housing and Infrastructure (DPHI) is seeking clarification that the Fire and Rescue NSW (FRNSW) December 2024 position statement on the open yard storage of BESS has been addressed in the PHA, specifically in terms of each of the FRNSW recommendations. Additionally, a follow-on question from the meeting at the M4 Berth on 2 April 2025 where state of charge (SoC) of imported lithium-ion batteries (LiB) was discussed and the Port of Newcastle advising there was no industry standard SoC for the sea transport of batteries and that the SoC varied with different battery manufacturers, is required. DPHI requests that a nominated maximum SoC be assessed in the PHA so that the impacts and risks of batteries with higher than 30% SoC could be identified.

1.1 Purpose of this addendum

This addendum is to provide further details regarding imported lithium-ion battery SoC and open yard storage layout to enable Port of Newcastle to respond to the DPHI request for clarification. This addendum should be read in conjunction with the full PHA.

2. Scope and limitations

2.1 Scope of work

Response to the following questions raised by DPHI:

– What is the hazard implications of storage of batteries with higher than 30% SoC
– Demonstrate compliance with the recommendations of the FRNSW position statement on the open yard storage of BESS.

2.2 Limitations

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3. Response

3.1 State of charge

When assessing separation distances, the original PHA assessed a worst-case scenario (i.e. a thermal runaway has occurred, and a fire has resulted) and the radiant heat consequences are independent of SoC.

SoC is more relevant during the charging/discharging process. If potential deposition of lithium metal on the negative electrode surface (dendrite growth) has occurred during an overcharge or an over discharge event, a higher SoC within a battery is more susceptible to a thermal runaway propagation from the destruction of the separator. The Port of Newcastle will not be undertaking charging (or discharging) processes whilst in storage.

Maintaining a separation distance between stored units, as determined by the PHA consequence assessment, will mitigate impacts of batteries being shipped with variable SoC. LiB units will be stored in accordance with the manufacturer's recommendations where available.

3.2 Open yard storage of BESS

The storage layout is not expected to be filled solely by batteries, but will include other cargo and energy generation infrastructure such as wind turbine blades etc. However, from a worst-case scenario, where only batteries are stored, the Port of Newcastle can accommodate a maximum of 55 full clusters (50 m x 50 m) and 10 part-clusters (less than 50 m x 50 m). This detail is shown in Figure 1 and is indicative only given the potential for other cargo to be present at any given time. Multiple emergency service vehicle access is also displayed in Figure 1. Firefighting equipment is not required, but the existing emergency response plan for the site will be updated by Port of Newcastle for effective response to a LiB fire emergency.

Depending on the supplier of the LiB, the number of units that can be stored within a cluster will vary. Port of Newcastle will manage maximum allowable LiB unit storage so that each unit is separated along the side of the unit that incorporates any access panel, door, or deflagration vent(s) by 1 m from the next unit, as outline by the PHA consequence assessment. Port of Newcastle management will also ensure that LiB units are not stacked (i.e. only one level of storage is allowed).

Figure 2 details the separation distance from the site boundary and adjacent clusters and is indicative only given the potential for other cargo to be present at any given time. This distance is designated as 6 m. The 6 m separation distance between clusters also allows for fire brigade vehicle access around each cluster of LiB units.

4. Conclusion

This addendum shows that:

1. The proposed storage design includes the FRNSW recommendations from the open yard storage of BESS guideline.
2. By including a separation distance of 6 m between adjacent LiB clusters in conjunction with a 1 m separation distance between adjacent LiB units within a cluster, propagation of a LiB unit fire during storage is not expected, regardless of the SoC of the LiB unit.

Figure 1 Battery storage overview

Figure 2 Battery storage layout

Project name		PON Battery import					
Document title		Preliminary Hazard Analysis Addendum					
Project number		12622176					
File name		12622176-ADM-A_LiB PHA addendum.docx					
Status Code	Revision	Author	Reviewer		Approved for issue		
			Name	Signature	Name	Signature	Date
S3	A	F. Duncan	S. Murphy		S. Pearce		04/07/2025
S4	0	F. Duncan	S. Murphy		S. Murphy		09/07/2025

GHD Pty Ltd | ABN 39 008 488 373
Contact: Fiona Duncan, Executive Advisor | GHD
180 Lonsdale Street, Level 9
Melbourne, Victoria 3000, Australia
T +61 3 8687 8000 | **F** +61 3 8732 7046 | **E** melmail@ghd.com | **ghd.com**