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6 March 2023

Brooke Marshal
Principal – renewable energy assessments
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Dear Brooke,

Re: Peer review of hydrology assessment for EIS for the Orana Battery Energy Storage System (Orana BESS).

Background and Scope

Southeast Engineering and Environmental have been engaged to undertake a peer review of the surface water assessment component of the Environmental Impact Assessment for the State Significant Development (SSD) Orana Battery Energy Storage System (Orana BESS).

Development and site description

The development consists of:

- An access road running from Goolma Road to the east connecting to the BESS area.
- The BESS area where battery storage systems are proposed on a large pad approximately 550m long and 120m wide running in an east west direction
- A substation at the eastern end of the BESS area
- Transmission connection from the existing Wellington substation to the BESS substation.

The landscape in and around the development area is predominantly cleared, undulating grazing land, generally falling to a point at the western end of the BESS area at a mapped first order stream. A second order stream runs past the western edge of the site at about 5m below the development footprint.

Site slopes average around 10-15% with flatter slopes of 3 to 5% to the north of the site, steepening at the top of catchments on higher land (360 to 400m AHD) and around drainage lines to the west and east.

Site soils over the proposed development area are predominantly the upper slopes of the Nanima soil landscape from the Oakdale and other volcanic geologies. Soils are generally shallow loams over sandy loams and clays on the upper slopes, with loams to clay loams on the mid slopes above well structured red clays with possible limestone outcropping.

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Soils are generally slightly to moderately erodible, however, this hazard increases considerably in areas of steeper slopes where clearing is undertaken.

Refer to Figure 1 for context.

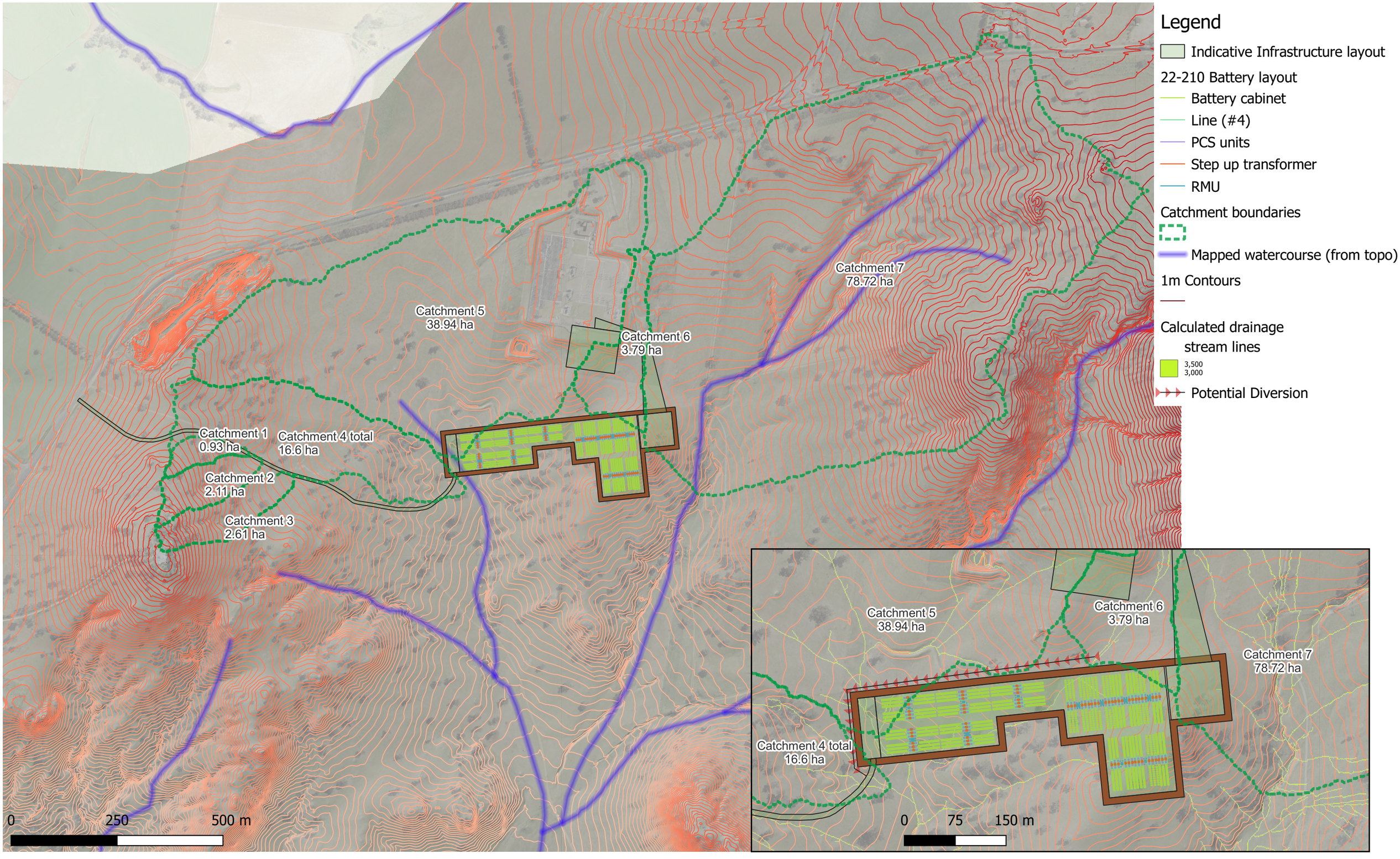

FIGURE 1: Site topography and hydrology - Peer review of surface water risks for Orana Battery Energy Storage System (Orana BESS).

DATE: 06/03/2023

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Peer review and recommendations

Flooding and surface water flows

The access road traverses a number of small drainage depressions from approximately 0.9 to 2.6 ha (Catchments 1, 2 and 3). Flows from these catchments can be managed with standard culvert road crossings.

Management of flows in this area is low risk and can be managed with standard unsealed road design and road culvert designs.

The western end of the BESS area sits across a mapped first order watercourse, intercepting a catchment of about 43ha (Catchments 5 and 6) as well as the lower end of a 16.6ha catchment to the east (Catchment 4). Diversion of flows up to the critical design event will be necessary to provide flood protection for the BESS area and to transfer catchment flows in a stable manner to the existing natural watercourse below the site. The Regional Flood Frequency Estimation Model (RFFE) estimates the median 1% AEP flow for combined catchments 5 and 6 at 11.3m^3/s, and for combined catchments 4, 5 and 6 at 15.5m^3/s.

The BESS area intercepts natural drainage from significant catchments that generate significant flows. Flooding and runoff from this area presents a high risk of impact to the development, both during construction and during operation. Detailed hydrologic and hydraulic analysis of these catchments will be necessary, along with the design and integration of a diversion structure with the BESS platform design to provide long term flood protection for the BESS and to transfer catchment flows in a stable fashion to the natural watercourse below the BESS site. A freeboard of at least 500mm for all infrastructure above the 1% AEP flood event, incorporating future climate change intensity estimates should be provided.

A second order watercourse runs to the east of the site draining a catchment of 78.7ha (Catchment 7). The site is at least 5m above the watercourse in this area. The Regional Flood Frequency Estimation Model (RFFE) estimates the median 1% AEP flow for this catchment at 19.6m^3/s. Channel grade is approximately 2%. Using a simple mannings equation approach, flow depth for this flowrate in this watercourse is about 1m deep, suggesting that the BESS area will be well above the 1% AEP flood level.

Although in close proximity there is significant vertical distance between the watercourse to the east and the BESS and substation area. This watercourse presents a low to medium risk to the development. The BESS and substation level should be checked against flood levels within this watercourse to confirm that a minimum of 500mm of freeboard is achieved from this watercourse.

Soil and water management during construction

As outlined, soils are slightly to moderately erodible, however, significant clearing and bulk earthworks are necessary to create access, and in particular, the BESS and substation area, which requires extensive cut and fill within flow path areas along with a significant flow diversion structure to manage upslope flows.

This extent of disturbance and proximity to drainage presents a high risk of the development on downstream water quality and the construction program. A detailed soil and water management plan will be necessary for the construction phase of the development. This will need to include:

- *Detailed understanding of soil properties across the site*
- *Construction sequencing strategy*
- *Management of upslope flows*
- *Detailed erosion and sediment controls, including sediment basins in accordance with relevant standards.*

Please contact the undersigned if you have any questions regarding this assessment.
Yours sincerely,

Lachlan Bain
Environmental Engineer BEng (Env) MEM.