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Agricultural Assessment Report  
Glenbrae BESS – Final

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Prepared: J Shovelton

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## Document control and status

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Glenbrae BESS. Agricultural Assessment  
Meridian Agriculture

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## Agricultural Assessment Report Glenbrae BESS

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### Executive Summary

This Agricultural Assessment Report examines the agricultural productivity of the proposed Glenbrae battery storage facility at 438 Lobbs Rd, and the impact of its construction on a range of agricultural considerations.

The site proposed for the BESS is approximately 10.5 ha.

The proposed battery storage facility on this site would have no long term detrimental effect on the productive capacity of the soil, nor would it have a significant impact on the overall productivity of the region or state, nor impact on the ability of neighbouring businesses to operate.

### Background

An agricultural assessment of the site for a battery storage facility at 438 Lobbs Rd, Glenbrae has been requested by AC Energy Pty. Ltd.

This report has been informed by the requirements of the "Solar Energy Facilities, Design and Development Guidelines", Victorian Government (2019)<sup>1</sup>.

The requirements outlined in the Guidelines are to:

- protect strategically important agricultural and primary production land from incompatible land use;
- protect productive agricultural land that is of strategic significance to a local area or in a regional context.
- avoid the loss of productive agricultural land without considering the impact of the loss on the agricultural sector and its consequential effect on other sectors.

Specifically the report covers the following aspects:

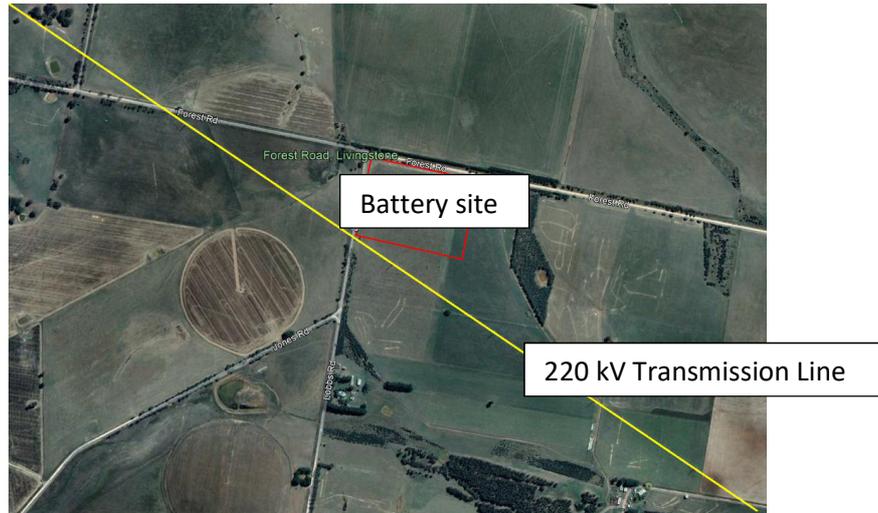
- the impact on the loss of the site if it has high quality soils, particularly soils that are niche to a type of crop or other agricultural activity
- the potential loss of reliable, accessible water (such as irrigated areas) and its impact at a local or regional scale.
- the impact of fragmentation and a change of land use to non-agriculture activity on local and regional productivity and output.
- the impact of a change of land use on recent and/or current efforts to modernise and reform agricultural activity in the area.

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<sup>1</sup> [https://www.planning.vic.gov.au/\\_\\_data/assets/pdf\\_file/0028/428275/Solar-Energy-Facilities-Design-and-Development-Guideline-August-2019.pdf](https://www.planning.vic.gov.au/__data/assets/pdf_file/0028/428275/Solar-Energy-Facilities-Design-and-Development-Guideline-August-2019.pdf)

- whether the land has specifically been set aside or defined for agricultural use and development in a planning scheme or other strategic document.
- whether the change in land use is to the detriment of a government’s previous or existing investment and support for the site or the area.
- whether the proposed solar energy facility can co-locate with other agricultural activity, to help diversify farm income without reducing productivity.

The proposed site shown in Figure 1, is 37 km northwest of Ballarat and 6.5 km southwest of Lexton. The site forms part of Allotment 1 Section 21, Parish of Ercildoun (SPI 1~21/PP2597) and is located adjacent to the 220 kV transmission line from Melbourne to Horsham. It is zoned Rural.



• **Figure 1 Location of Glenbrae battery storage facility**

### Site Characteristics

The site is flat and slopes to the west. There are no defined water courses on the proposed site so the construction of the facility will not have any significant impact on overland flow.

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## Geology,<sup>2</sup> and Soils

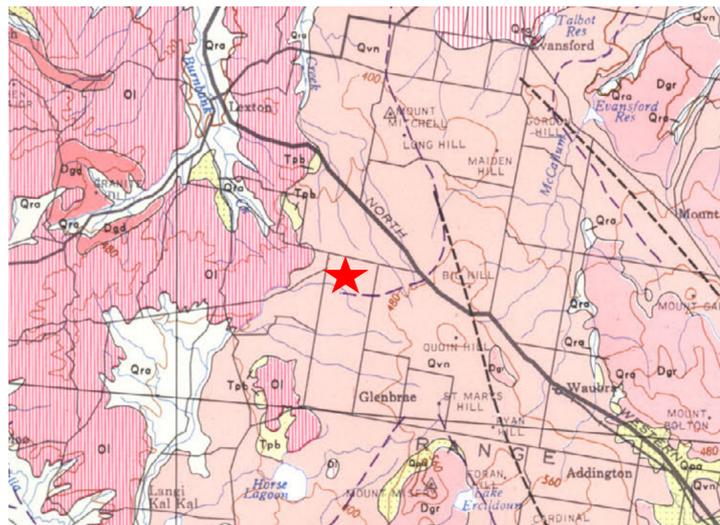


Figure 2. Geology of site (★ Battery site)

The soils on the site are derived from Newer Volcanics (Qvn) (Figure 2). They are classed as Chromosols<sup>3</sup>. (Figure 3)

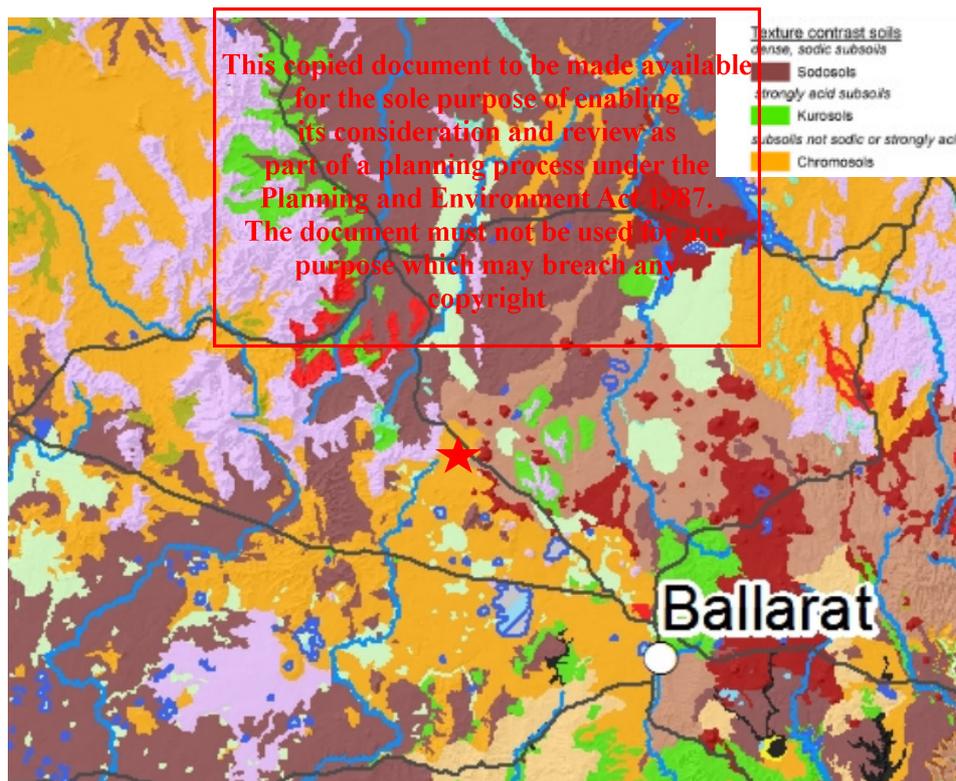


Figure 3. Soil types, Ballarat district. (★ Battery site)

<sup>2</sup> <http://earthresources.efirst.com.au/product.asp?pid=976&cid=32&c=23049>,

<sup>3</sup> [https://vro.agriculture.vic.gov.au/dpi/vro/vrosite.nsf/pages/victorian\\_soils\\_map\\_2014\\_pdf/\\$FILE/VicSoilMap.pdf](https://vro.agriculture.vic.gov.au/dpi/vro/vrosite.nsf/pages/victorian_soils_map_2014_pdf/$FILE/VicSoilMap.pdf)

Chromosols display a strong texture contrast between surface (A) horizons and subsoil (B) horizons. The upper part of the subsoil ranges from slightly acid to alkaline (pH >5.5) but is not sodic and therefore not dispersive. This indicates that chemically, the subsoil is benign from a plant growth perspective.

In their natural state these soils would have been deficient in phosphorus, nitrogen, sulphur and molybdenum. The current nutrient status of soils will be a reflection of recent fertilizer history and the phosphorus and sulphur levels would have improved through the addition of fertilizers during the cropping phase. The site has also been limed to reduce soil acidity.

While these soils are of good quality, the owner does not consider them to be as productive as the red soils (Kraznosems) to the south of this site.

### **Agricultural Use**

The property was purchased by the current owner in 1999. Cropping was done on a share farming basis until 2014. Evidence of a canola crop in a previous year can be seen in Figure 4 and Figure 5.



**Figure 4. Historical view of site from Forest Road, looking south (2010)**

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Figure 5. Historical view of site from Lobbs Road, looking east (2010)

Following the cessation of cropping the site was sown to improved perennial pasture grasses (phalaris and cocksfoot) and has been grazed with cattle since then. No further development of the block has been planned.

Figure 6 shows the pasture status in May 2022.



Figure 6. Pasture on site, May 2022

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There are a number of privately developed centre pivot irrigation systems in the vicinity of the proposed site. The irrigation water is sourced from ground water. While it is theoretically possible for the site to be irrigated, the presence of the existing transmission lines would significantly limit the size, location and type of irrigation that could be undertaken.

Lucerne has been grown on adjacent paddocks to the south, confirming the quality of the subsoil. Lucerne is intolerant of acid and poorly drained subsoils.

## Agricultural Assessment

### Strategic importance of land

The site has no strategic importance. The area is not specifically mentioned in any planning scheme as being of high value agricultural land nor has the land been subject to government programs that would limit the ability of the facility to proceed.

### Agricultural Productivity

#### Stock Productivity

The length of growing season can be used to provide an estimate of potential stock carrying capacity<sup>4</sup> of an area. The growing season is a function of amount of rain and its distribution. Realisation of this potential depends on consistent good agronomy and husbandry and the absence of inherent soil constraints.

Based on the rainfall data for the area, the likely average growing season is about 7 months for the property. This indicates a potential stocking rate of around 13 Dry Sheep Equivalents<sup>5</sup> (DSE) /ha. For a cattle operation this would equate to a maximum of eight breeding cows on the site. Farmers normally run at less than potential stocking rate to manage the risks associated with adverse seasons. This is the case with the owner who has stated that he is running a cow and calf to 1.5ha - equivalent to 11 DSE/ha, or seven cows on the area of the site.

On current economic returns<sup>6</sup> the cattle operation is likely to return an average gross margin of around \$495/ha. The return to the farmer would be reduced by the cost of overheads, depreciation and finance costs. The nett return from grazing is not high and is subject to seasonal and market fluctuations. The returns from the battery storage facility will be more consistent, achieve better returns and provide a diversified source of income.

The loss of the number of stock potentially carried on the site (maximum seven cows) is insignificant in relation to the State's cattle herd of 1.4 million head.<sup>7</sup> The loss of this level of production will have an unmeasurable impact on the economy of the district.

<sup>4</sup> Saul G.R and Kearney, G.A (2003) Potential carrying capacity of grazed pastures in southern Australia, Department of Natural Resources and Environment, Victoria.

<sup>5</sup> Dry Sheep Equivalent is a standard animal (non lactating/non pregnant 50 kg sheep) that is used to compare carrying capacity, profitability, etc., between different stock types. For example, one breeding ewe is equivalent to two DSE over a year and a cow and calf is equivalent to 17 DSE over a year.

<sup>6</sup> <https://agriculture.vic.gov.au/about/agriculture-in-victoria/livestock-farm-monitor-project#h2-0>

<sup>7</sup> [https://agriculture.vic.gov.au/\\_\\_data/assets/pdf\\_file/0012/699285/Beef-Fast-Facts-June-2021-Final.pdf](https://agriculture.vic.gov.au/__data/assets/pdf_file/0012/699285/Beef-Fast-Facts-June-2021-Final.pdf)

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## Crop Productivity

While the area is currently used for grazing, it would be possible to crop the area, as has been done in the past. Potential crop yields can be inferred from the growing season rainfall (GSR). In simple terms, growing season rainfall (mm) is a combination of a 50% discount of the rain falling from February to April, plus the rainfall from May to October. This figure is multiplied by a factor of 20 to give the potential yield of wheat and by 10 to give the potential yield for canola.

Rainfall data for this location<sup>8</sup> indicates that the average growing season rainfall for the last 20 years has been around 396 mm. This equates to a potential yield of 7.9 t/ha for wheat and 3.9 t/ha for canola. These figures assume excellent agronomy and absence of subsoil impediments. Data from a recent survey of the economics of grain production in Victoria<sup>9</sup> indicated a conversion factor of 80% of potential yield is a realistic outcome. Therefore lower yields of 6.3 t/ha wheat and 3.1 t/ha for canola should be achievable, long-term yields for an intensively farmed cropping property.

Based on 50% price deciles for wheat<sup>10</sup>, (\$280/t) the gross income would be expected to be around \$1680/ha when the crop.

The latest available data for cropping<sup>11</sup> indicates average variable costs of \$273/ha to give a gross margin of \$1,407/ha for wheat. As with grazing, overhead costs such as rates, insurance, power, etc. need to be deducted from these gross margin figures to arrive at net farm income, out of which financing costs, capital purchases, etc., would need to be paid.

The removal of ten hectares from agricultural production in this area would on average, result in a loss of around 79 t wheat/year to the State and 31 t canola/year. These are insignificant amounts when compared to the State's predicted production for 2022-23 of 3,813,000 t wheat and 990,000 t canola<sup>12</sup> and would have no impact on the total production of the districts under the

## Agrovoltaic considerations

There will be no agrovoltaic opportunities during the operation of the battery as most of the area will be covered by a hard stand.

## Impact on agricultural use of land

Should the site be decommissioned, the productivity of the land could be restored/improved through standard agricultural practices.

## Impact on surrounding land

The facility will have no impact on the ability of surrounding land owners nor the current owner to undertake agricultural activities. It will not isolate any parcels of land as the adjoining land is accessible from Lobbs Road and Forest Road.

<sup>8</sup> <https://www.longpaddock.qld.gov.au/silo/point-data/> -37.3 143.55

<sup>9</sup> Cropping Zone Management Guideline Victorian High Rainfall. GRDC (2017)

<sup>10</sup> <https://mecardo.com.au/wp-content/uploads/2022/08/Grain-Percentiles-August-2022.pdf>

<sup>11</sup> The integration of technical data and profit drivers for more informed decisions, GRDC

<sup>12</sup> <https://www.agriculture.gov.au/abares/research-topics/agricultural-outlook/australian-crop-report/victoria>

## Conclusion

The proposed Glenbrae BESS will cover an area of 10.5 ha, 37 km north-west of Ballarat.

In the recent past the site has been used for grazing, while previously, it has been extensively cropped.

While the soils are of reasonable quality, they are not uniquely good. Irrigation is undertaken adjacent to the site, but the potential for this to expand will be constrained by the presence of the 220 KVA transmission line

The loss of production from the diversion of this land to a battery storage facility will have an insignificant impact on the State's agricultural production and the loss of income to the owner from grazing will be more than compensated by the income from the BESS.

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7 September 2022

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