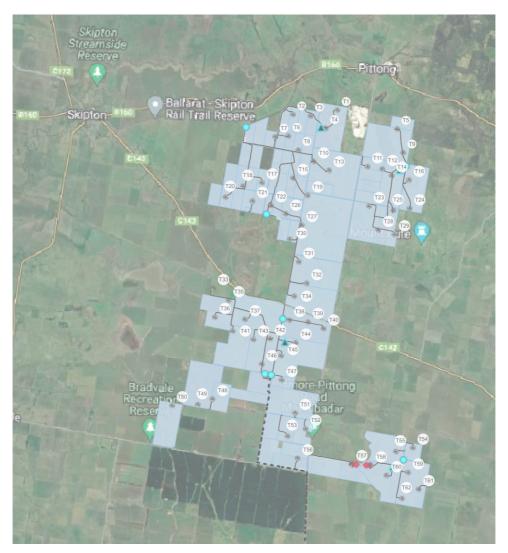


Geotechnical Desktop Study



Proposed wind farm at

Moreton Wind Farm

File No: 230350

Date: 31 October 2023

Client: MHWF Nominees Pty Ltd L1, 17 Moore Street CANBERRA ACT 2601



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Introduction

A desktop study was undertaken to provide an initial geotechnical assessment of the proposed Moreton Wind Farm site. Relevant geological maps were examined with the purpose of providing feasibility foundation and pavement advice for the proposed construction of the forty-five proposed wind turbines, access tracks, substation, underground transmission line and a batching plant.

Scope of the Study

The study is limited to a desktop review only.

The scope of this report is to provide comments on the anticipated foundation systems and pavement options, based on experience in the region and its geology, as interpreted from appropriate maps.

Site investigation work will be required to confirm the assumptions made in this report and for any design purpose.

Site Description

The site of the Moreton Wind Farm is located approximately 135km Northwest of Melbourne and approximately 5km East of Skipton. (Figure 1). The proposed turbine locations appear to be predominately constructed on existing pastoral grazing / farming land, and adjacent quarry to the northeast and on flat basalt plains tot the south. Aerial images suggest the site has a sparse ground cover of trees and shrubs and an underlying cover of grasses.

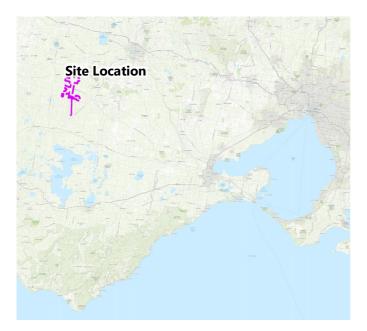


Figure 1. Location Plan

Subsurface Conditions

Regional geology

The site is identified on the 'Geological Survey of Victoria' Ballarat Sheet (1:250,000), Figure 2 below as being in the province of the Devonian granite, and the Quaternary "Newer Volcanics" formations, with some localised zones of Quaternary low-level alluvium, Quaternary lagoon and swamp deposits, and Tertiary "Newer Volcanic hill wash".



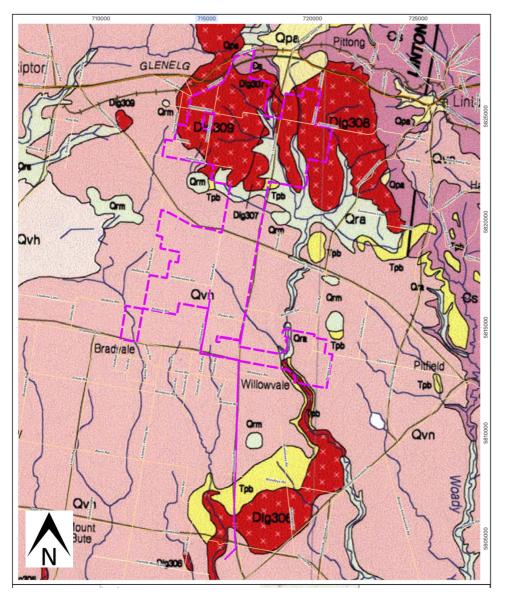


Figure 2. Extract from 'Geological Survey of Victoria' Ballarat Sheet (1:250,000) with Site Envelope - - -

Anticipated subsurface conditions.

The subsurface profile is expected to comprise:

- Surface residual silts and sands, possibly with some gravel, underlain by,
- Moderately to highly reactive CLAY soils, underlain by,
- Granite/basalt ROCK

The topsoils may be dispersive, and some topsoil sediment transport & erosion is possible.

The depth to the granite/basalt ROCK may be shallow but variable across the site; numerous and closely packed boulders may be present above the granitic/basaltic rock interface. These boulders may be large and difficult to excavate or remove and may make foundation excavations problematic. Large and/or specialist excavation plant, rock breaking, coring, ripping, or blasting may be required.

An effective design philosophy aimed at minimising excavation will provide a more cost effective and practicable approach at this site.

The subsurface geology will need to be confirmed prior to construction through direct sampling methods.



With reference to Figure 3, Visualising Victoria's Groundwater (VVG), the local groundwater table appears to be variable across the development site, with an average depth expected to be between 5m - 10m.

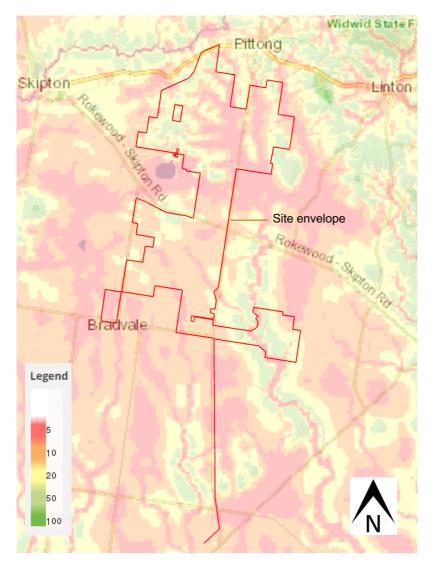


Figure 3. Extract from 'Visualising Victoria's Groundwater' database, showing the approximate depth to the local groundwater table. Legend depth in meters.

Transient perched groundwater may form within the upper topsoils at shallow depths during the wetter months. The regional groundwater regime would be investigated during a detailed geotechnical investigation, as necessary.

The geological setting is favourable in terms of interaction between the soil mass and groundwater regime.

Foundation options

It is understood that loading conditions are relatively light for wind turbine structures, with overturning movements usually the critical loading condition in the order of 200kPa (peak edge pressures). The natural CLAY soil or granite/basalt ROCK should readily accommodate such loads.

It is expected that a mass pad footing will provide the most practicable foundation type for the structure.

Where shallow or outcropping rock is locally present, high bearing pressures will be available at the surface and the footing could be formed above ground to avoid or minimise excavation.



Piled footings, and the use of rock/cable anchors would provide further alternatives to a conventional pad type footing, however the final foundation design will be based on economics with all alternatives providing a stable foundation.

Subject to further investigation and the preferred design, it is expected that site specific difficulties should be readily negotiated.

Footings for the associated control booths and substation could comprise conventional slabs, strips, or pads, depending on construction methods and the soil profile encountered.

Pavements

It is expected that access roads will be required for the construction of the wind farm and future maintenance.

Heavy construction vehicles and large cranes may be required during the construction period. Traffic frequency and loading conditions on access roads during construction may be high. However, post-construction traffic is likely to be low and comprise light vehicles for maintenance purposes only.

Subgrade properties may be poor, and pavement construction could be difficult during wetter months. Some form of subgrade improvement or geo-reinforcement may be required. This could include in situ lime/cement stabilisation upon which the pavement is constructed or placement of a geo-fabric on the stripped surface upon which the pavement is constructed.

Conventional construction practices should be able to accommodate the ground conditions on site (evidenced by existing roads and pavements).

Potential for acid sulphate soils:

Acid sulphate soils are naturally occurring soils which form under waterlogged conditions. Typically, these occur on coastal margins. Distribution of coastal acid sulphate soils in southwest Victoria is shown below in Figure 4. The proposed wind farm is located well outside the zone of coastal deposits.



Figure 4. Coastal Acid Sulphate Soil distribution



Inland acid sulphate soils are much less common. An inland occurrence has been recorded to the west of Grampians National Park (referenced 1). No records were identified to be associated with the area around the Moreton Hill Wind Farm.

Report notes

This report contains information for the feasibility stage of the proposed development. Detailed geotechnical site investigation and reporting will be required for design purposes.

During the construction period, land may be disturbed and exposed to erosion. Erosion and sediment runoff can be minimised/controlled by adopting good construction practices referenced below (2), (3) and (4). Further information regarding geotechnical site investigation reports is referenced below (5).

Should there be any further queries please do not hesitate to contact this office for further advice.

Yours faithfully, Melbourne Geotechnics Pty Ltd

References

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