

H A R D R O C K



G E O T E C H N I C A L
CONSULTING GEOTECHNICAL ENGINEERS

Geotechnical Assessment Report

RE: Proposed wind turbine development at:

Leonards Hill, Ballan-Dayelsford Road.

HardRock

Geotechnical

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Introduction:

A 'desk top' study was undertaken in order to provide an initial geotechnical assessment of the proposed Hepburn Community Wind Park. Information provided indicates that two turbines are proposed on the southern slope of Leonards Hill adjacent to the Ballan-Daylesford Road. Relevant geological maps were examined with the purpose of providing feasibility foundation and pavement advice for the proposed construction of the wind turbines.

Scope of the Study:

The study is limited to a desk top 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 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 proposed wind turbines is located approximately 10km south of Daylesford on the eastern side of the Ballan-Daylesford Road, corner of Leonards Hill Bullarto South Road. The site of the proposed turbines is located on the southern slopes of Leonards Hill. The site appears to be a gently sloping hill with a moderate fall away from the hill top/ridge line and appears to be moderately drained.

From the photographs provided the site appears to generally comprise cleared agricultural land. The site appears to be generally grassed with a few scattered trees.

Subsurface Conditions:

Regional geology

The area of the proposed wind turbine development lies within the 'Geological Survey of Victoria' Daylesford Sheet (1:50,000). The geology of the turbine site identified on the geological map comprises Quaternary 'Newer Volcanics' – 'Basalt: dominantly tholeiite to mildly to mildly alkalic olivine basalt: localised lava flows partly confined in palaeovalleys; youngest flows have stony surfaces.'

An eruption point is marked at the apex of Leonards Hill on the 'Geological Survey of Victoria' Daylesford Sheet (1:50,000), indicating that the hill is an ancient volcano,

Discussion:

Anticipated subsurface conditions

The Newer Volcanics formation is identified around the wind farm development site, and is expected to dominate its subsurface characteristics.

It is expected that the hill top location of the proposed wind turbines is representative of a smaller erupting volcano (now distinct).

The subsurface profile is expected to comprise shallow surface residual silts, underlain by highly reactive silty clays which grade to variably weathered basalt rock with depth. The depth to bedrock may be variable and numerous discredited basalt floaters and closely packed boulders may be present above the basalt rock interface.



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

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). Either the natural clay soils or low capacity rock should readily accommodate such loads. Foundations will be founded at a depth such that there will be no instability to the foundations. The foundations will not impact on the stability of the adjacent ground.

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

It is expected that no significant difficulties will be associated with the construction of the wind turbine foundation.

Pavements

Subgrade properties within the Quaternary 'Newer Volcanics' may be poor. Some form of subgrade improvement 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. This is common practice and foresee no difficulties in pavement construction.

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 (1), (2) and (3).

Further information regarding geotechnical site investigation reports is referenced below (6).

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

Yours Faithfully,
HardRock Geotechnical Pty Ltd

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References

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- (3) Ransom, M.J., 1987: *Control of erosion on construction sites*. Department of Conservation Forests and Lands, Victoria
- (4) Geological Survey of Victoria. 1996. 1:50,000 Geological Map Series *Linton, 7622-4 zone 54 Edition 1*. Department of Natural Resources and Environment.
- (5) GeoVic. 2005. 1:26,000 <http://nremap-sc.nre.vic.gov.au/MapShare.v2/imf.jsp?site=min>
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- (8) Department of Primary Industries. 2005. *GeoVic web site: <http://nremap-sc.nre.vic.gov.au/MapShare.v2/imf.jsp?site=min>*.