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Project Number: PTP/09180
Letter Number: PTP/09180 – 0001 – Rev3
Project Name: Darlington Wind Farm

Desktop Study Darlington Wind Farm

1. INTRODUCTION

At the request of GPG Australia Pty Ltd (GPG), Protest Engineering (Protest) carried out a desktop study for the proposed new windfarm located between the townships of Darlington and Mortlake.

It is understood that the proposed development will comprise the construction of approximately 60 wind turbine generators (WTGs) across numerous properties of an approximate area of 7600 hectares bisected by the Hamilton Highway.

This desktop study report aims to provide comments addressing potential issues that may derive from land stability, acid-sulphate soils and/or highly erodible soils in the area.

A summary of our findings is presented in Section 4 following details of the desktop study in Section 3.

2. SITE LOCATION

The proposed site location (Figure 1) is between the township of Mortlake and Darlington, located approximately 200 km west of Metropolitan Melbourne. The proposed site comprises of numerous individual property boundaries and is bisected by the Hamilton Highway servicing both Mortlake and Darlington township.



Figure 1: Proposed Site Location

3. DESKTOP STUDY FINDINGS

TOPOGRAPHY

Based on Google Earth satellite imagery and VicPlan sourced topographic data, it is expected that the locality of the global topography of the proposed site will be reasonably flat with a very slight slope down towards the south (negligible in the scale of the proposed site).

HISTORICAL IMAGERY AND PREVIOUS WORKS

A review of historical imageries was carried out using the Google Earth platform.

- Earliest high-resolution imagery available for detail review is from part January 2008 and April 2009.

Based on historical imageries, the subject land use (as a farm land) remains relatively unchanged since 2008/2009 with no significant changes or development other than the use of water retention/collection features such as ponds and light-weight on-ground structures such as dwellings/sheds.

A review of historical imageries was also carried out using the Nearmap platform.

- No historical imageries were available in the platform for regional areas, specifically Darlington and Mortlake.

GROUNDWATER

Based on a review of the data available from Visualising Victoria’s Groundwater website, the following wells shown (orange and blue markers) in Figure 2 below were reviewed.

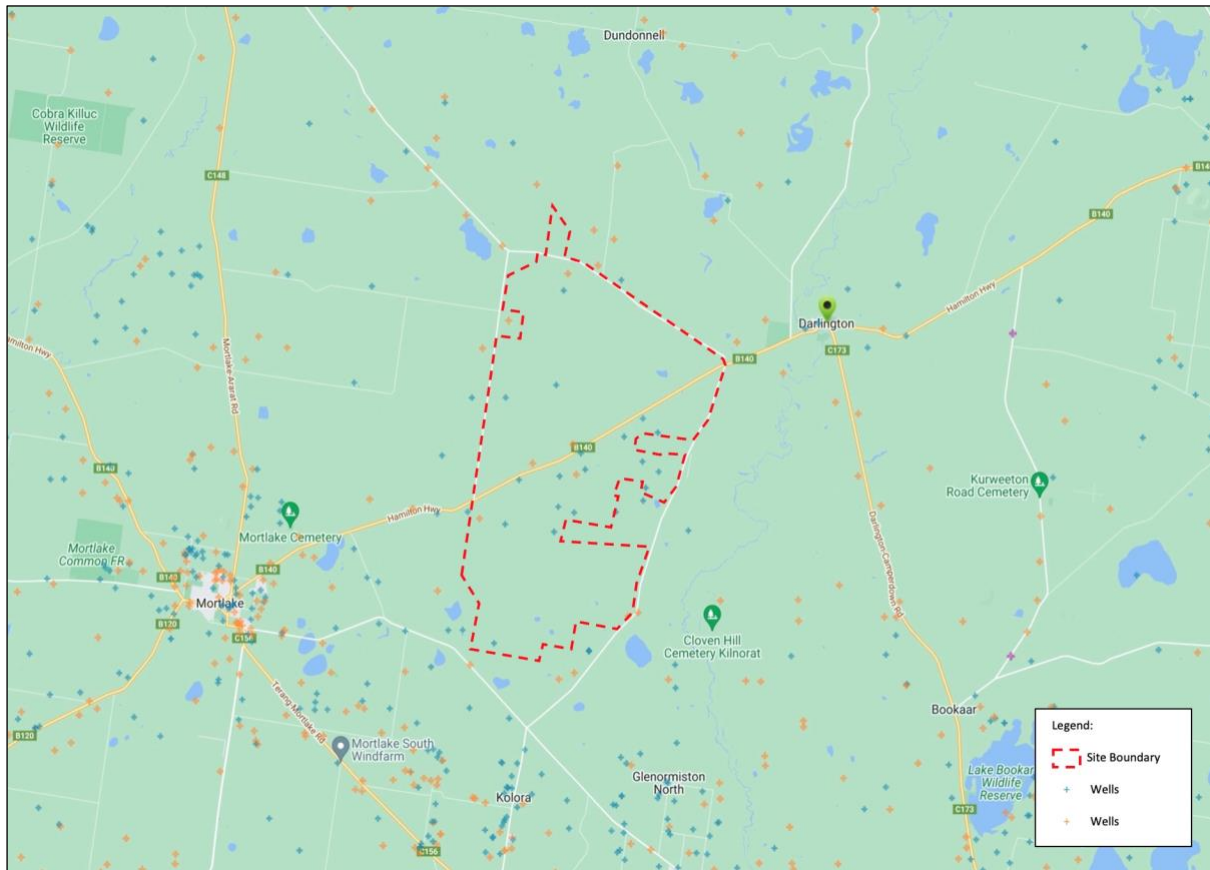


Figure 2: Review of Groundwater Wells from Visualising Groundwater Victoria

Visualising Victoria’s Groundwater website indicate that groundwater could be expected shallower than 5m depths. It should be noted that groundwater levels can be perched and fluctuate seasonally and during and after heavy rainfall events. Given this natural variability, it is prudent to assume that water levels can fluctuate.

Specific levels of the groundwater table were not available in any of the wells reviewed within the proposed project site.

GEOLOGY

Globally, the site (Figure 3) is within an area of Quaternary (Qno1 - yellow) Newer Volcanics consisting of olivine basalt interbedded with silts, sands and clay with regional/local sites within an area of Quaternary (Qm1) Swamp and Lagoon deposits consisting of clay, silt and sand.

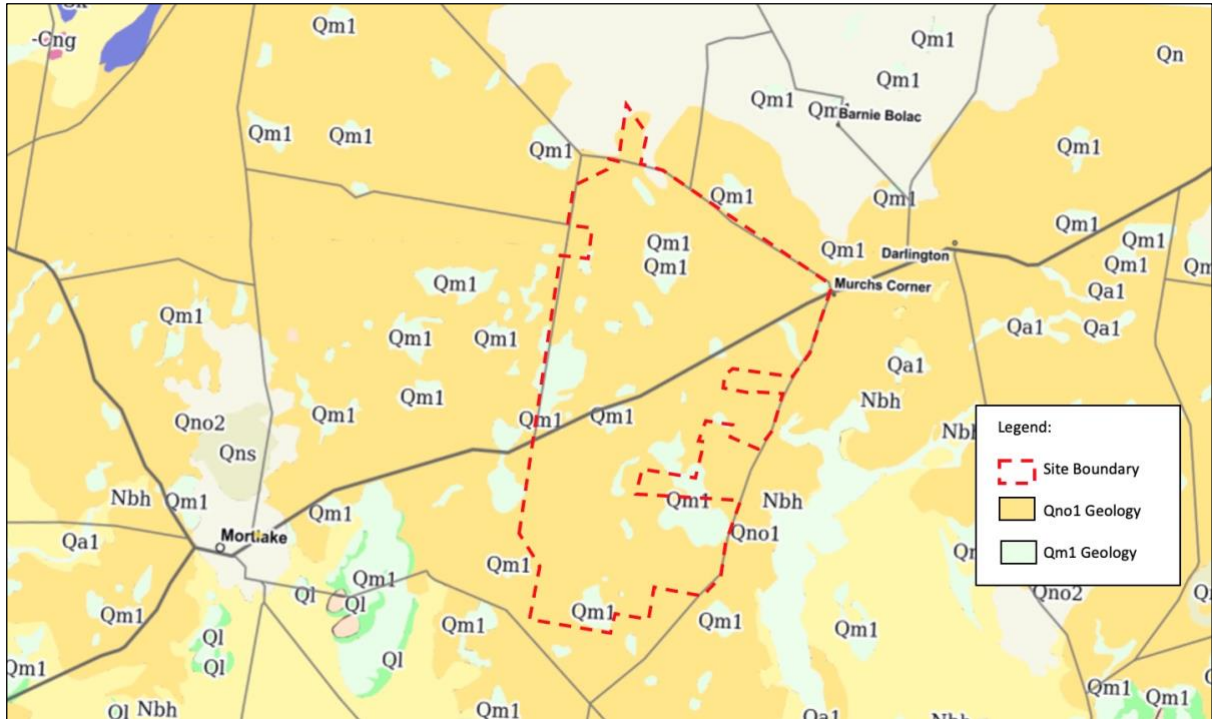


Figure 3: Overlay of Proposed Site on Geological Map

Based on the geology across the proposed site, it is likely that the subsurface condition (Qno1) will largely comprise of surficial layer of topsoil (due to farming) underlain by natural silty clay (highly plastic/reactive) then weathered basalt rock.

As some local sites could present a differing geology of (Qm1) Swamp and Lagoon deposits, these areas could comprise of surficial clay/silt/sand material overlying the Newer Volcanics soils.

OTHER CONSIDERATIONS RELATING TO GEOLOGY

Due to the proposed site being largely underlain by highly reactive clay, a seasonal shrink swell surface movement of up to 75mm (typical for a Class H2 site) in accordance with AS2870 – 2011 can be expected for any surface and light-weight structures.

Good site drainage must be maintained and it will be necessary to avoid building or planting within mature tree/s zone of influence (typically distance equivalent to 1.0 to 1.5x mature tree height – this should be increased when in close proximity to row of trees).

ACID-SULFATE SOILS

A review was undertaken on data available from Agriculture Victoria (VRO) website and the Australian Soil Resource Information System (ASRIS).

Part 1 – VRO DATABASE

VRO website provided a mapsheet of potential acid-sulfate soils and a detailed search surrounding the Mortlake area did not return any risk of potentially acid-sulfate soils (Figure 4).

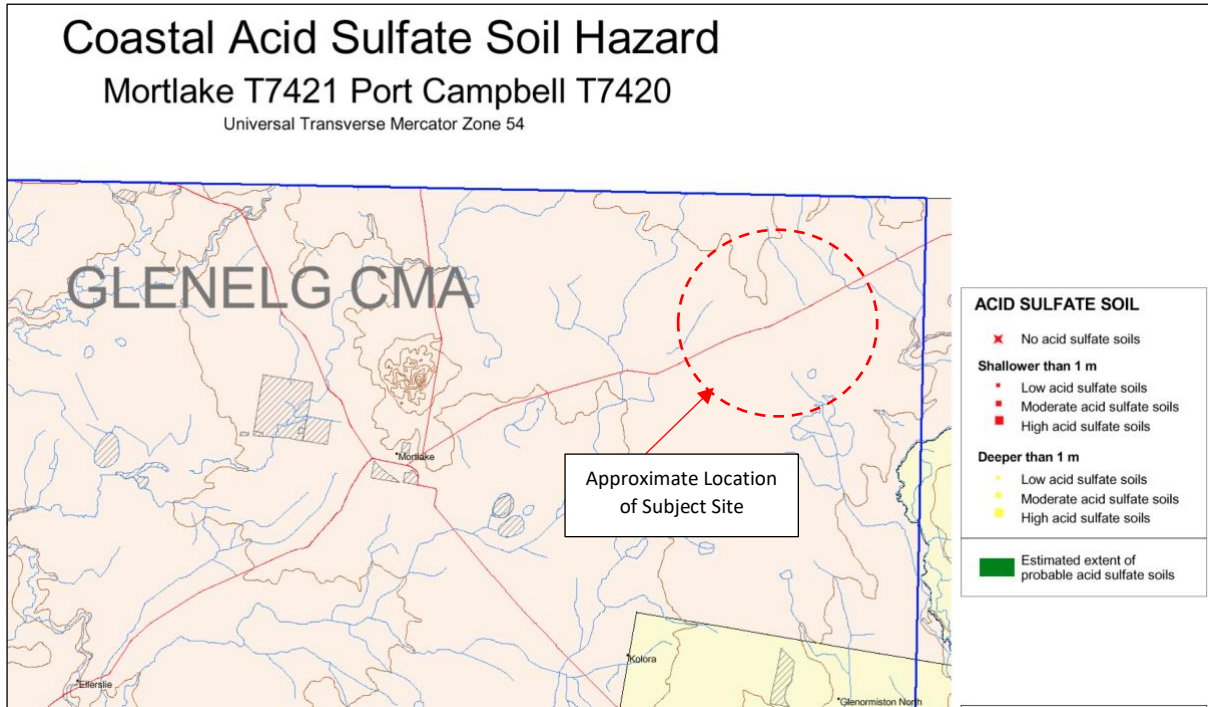


Figure 4: Potential for Acid-Sulfate Soil Map (VRO Database)

It is considered that the risk for potential acid-sulfate soils within the proposed subject site is very low.

LAND STABILITY

A review was undertaken on data available from Planning Victoria website which provided an interactive map to explore the range of planning overlays on the subject site. The mapping confirmed that the area is within the Farming Zone (FZ) with no notable land management overlays such as the Erosion Management Overlay (EMO), Flood Overlay (FO), Land Subject to Inundation Overlay (LSIO) and Salinity Management Overlay (SMO).

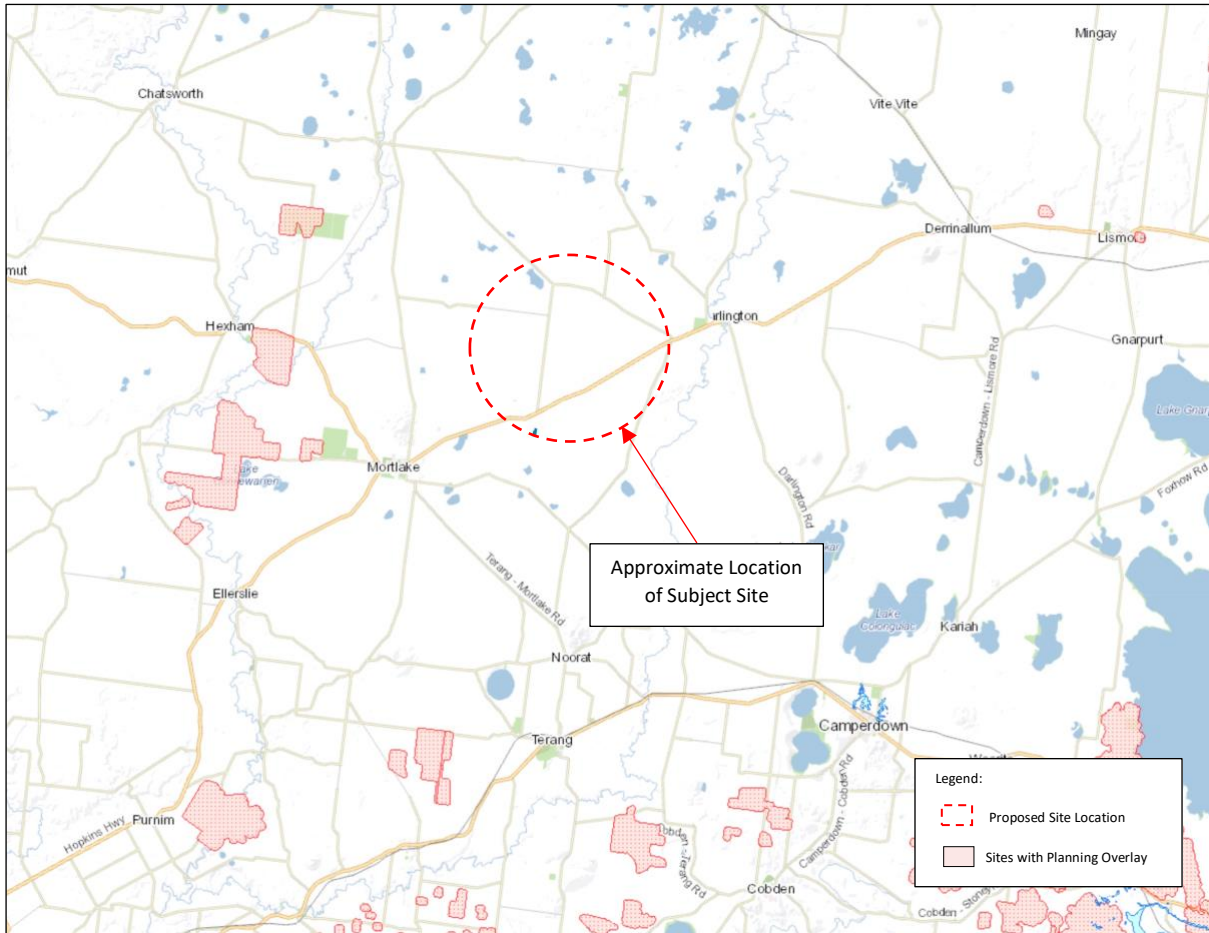


Figure 6: Data from Planning Victoria website does not indicate any Erosion Management overlay

Based on the proposed site being relatively flat, largely comprising of highly plastic clay overlying weathered rock, and not having any significant/notable planning overlays, it is considered that the risk for potential erodible soils and areas of instability is very low.

4. SUMMARY

ITEM	FINDINGS
Topography	Reasonably flat
Land Changes	None significant
Groundwater	Between 0 – 5m (based on mapping) No actual groundwater data available from review of boreholes.
Geology	Major : Newer Volcanics (Qno1) Minor : Swamp Deposits (Qm1)
Potential for Acid-Sulfate Soils	Major : Very Low to Low Risk Minor/Localised : Medium to High Risk
Potential for Erodible Soils	Very low risk
Potential for Land Instability	Very low risk
Other Considerations	<ol style="list-style-type: none"> Highly reactive clays – structure/s must be able to tolerate seasonal shrink-swell surface movement up to 75mm typical for a Class H2 site, in accordance with AS2870 – 2011. Good site drainage and limit construction near zone of influence of mature trees must be maintained to reduce exacerbation of seasonal shrink swell movement.

We trust that the above information is suitable for your present requirements. Should you have any queries, please do not hesitate to contact the undersigned.

Protest Engineering



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