

Our Ref: PSM4854-004L Rev 1

28 April 2023

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Attention: Hugo Hannah

Dear Hugo

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**RE: WILTON PARK ROAD & BERWICK PARK ROAD -  
PLANNING PROPOSAL - REV 1**

**1. Introduction**

This letter presents our preliminary geotechnical assessment for the proposed development at Wilton Park Road and Berwick Park Road. This assessment is undertaken for the purpose of re-zoning application. The site is located within the West Wilton precinct of Wilton Growth Area and is approximately 108ha in area, which comprises multiple lots.

**2. Site Walkover**

PSM undertook the site walkover on 15 September 2022 by driving around the site to:

- Inspect and characterise landforms
- Identify areas of geotechnical risks/ hazards that may be of concern
- Take general site photos.

Figure 1 presents the location of selected site photos taken during the site walkover.

The selected photos are presented in Appendix A.

**3. Site Description**

**3.1 Lot boundaries**

At present, the site encompasses the following Lots:

- 30 Berwick Park Road
- 20 Berwick Park Road
- 10 Berwick Park Road
- 25 Wilton Park Road
- 45 Wilton Park Road
- 55 Wilton Park Road

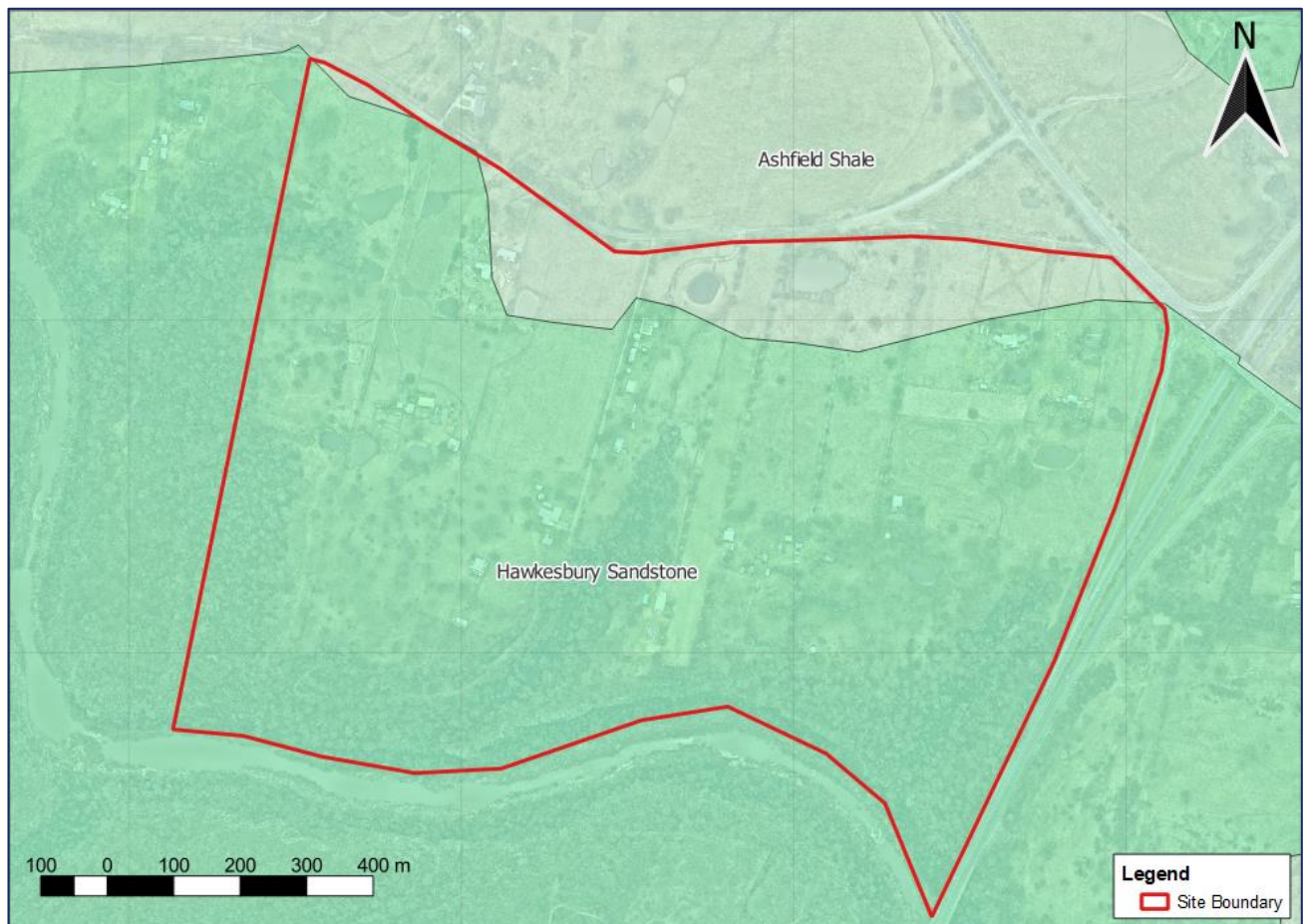
- 75 Wilton Park Road
- 85 Wilton Park Road
- 95 Wilton Park Road.

### 3.2 Geological Setting

A reference to the NSW Seamless Geology Map (reproduced as Inset 1) indicates that:

- The southern portion of the site is underlain by Hawkesbury Sandstone (*Rh*) – Medium to coarse-grained quartz sandstone, very minor shale and laminate lenses
- The northern portion is underlain by the Wianamatta group formation (*RWa*) – Laminite and and dark-grey siltstone.

Similarly, a reference to the eSpade soil landscape mapping also indicates that the site is underlain by Wianamatta Group shale and the ground is described as moderately reactive with highly plastic subsoils.



**Inset 1: Geological Map of the Site (data from NSW Seamless Geology Map)**

### 3.3 Surface conditions

We note the following regarding the surface conditions at the time of the walkover.

- The site consists of level and uneven (sloping grounds), in particular closer to the Nepean River and at the creek at 45 Wilton Park Road
- The site is bounded by a cliff face on its southern boundary due to the Nepean River
- The site is mostly covered in vegetation (grass, tress, bushes etc.) which gets thicker closer to the Nepean River and at the creek at 45 Wilton Park Road
- There are several man-made features (i.e., dams and embankments) within the site. The dams embankments could be up to few meters high



- Soft ground was observed in the vicinity of a number of dams
- Two prominent waterways/ water features were observed within the site; one at 45 Wilton Park Road and another at 30 and 10 Berwick Park Road
- Rock outcrops were observed across the site, in particular closer to the Nepean River and at the creek at 45 Wilton Park Road.

### 3.4 Inferred subsurface conditions

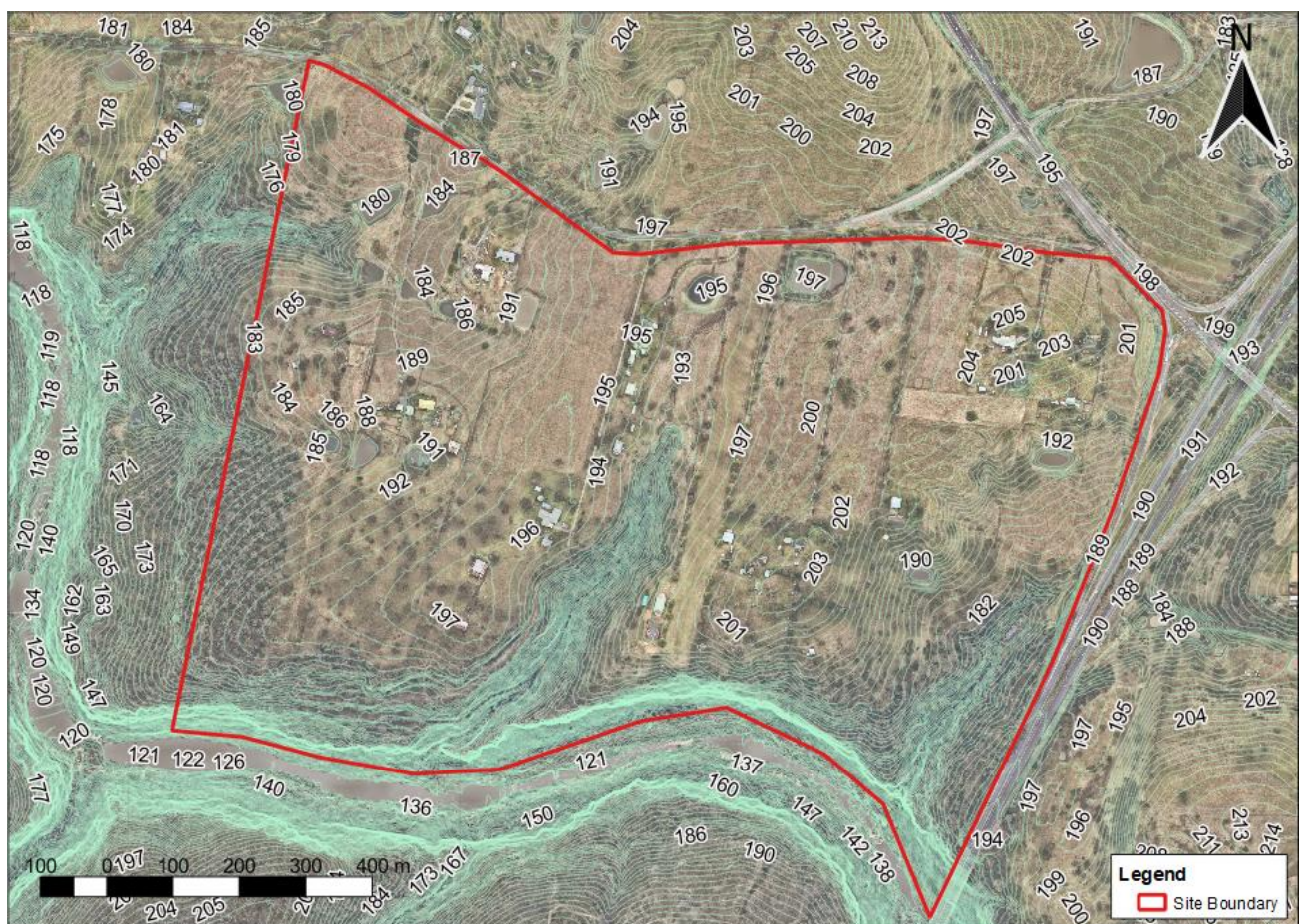
We have not sighted any ground investigations report for the subject site at the time of writing. From our site walkover, we noted rock outcrop at several areas. Based on this, we are of the opinion that rock within the site is potentially relatively shallow.

### 3.5 Topography

The topography data of the site has been obtained from the ELVIS Elevation and Depth portal and has been reproduced in Inset 2.

The data as shown in the figure indicates the following about the site:

- The northern portion slopes down from east to west in a relatively gentle gradient
- Steep gradient (i.e., rapid drop in elevation) is noted at:
  - Southern (as expected given the presence of the cliff face) and eastern boundary of the site, towards the Nepean River
  - Around the creeks/ water ways at Lots 45 Wilton Park Road, 30 Berwick Park Road and 10 Berwick Park Road.



**Inset 2: Site topography (data from ELVIS, retrieved 13 September 2022)**

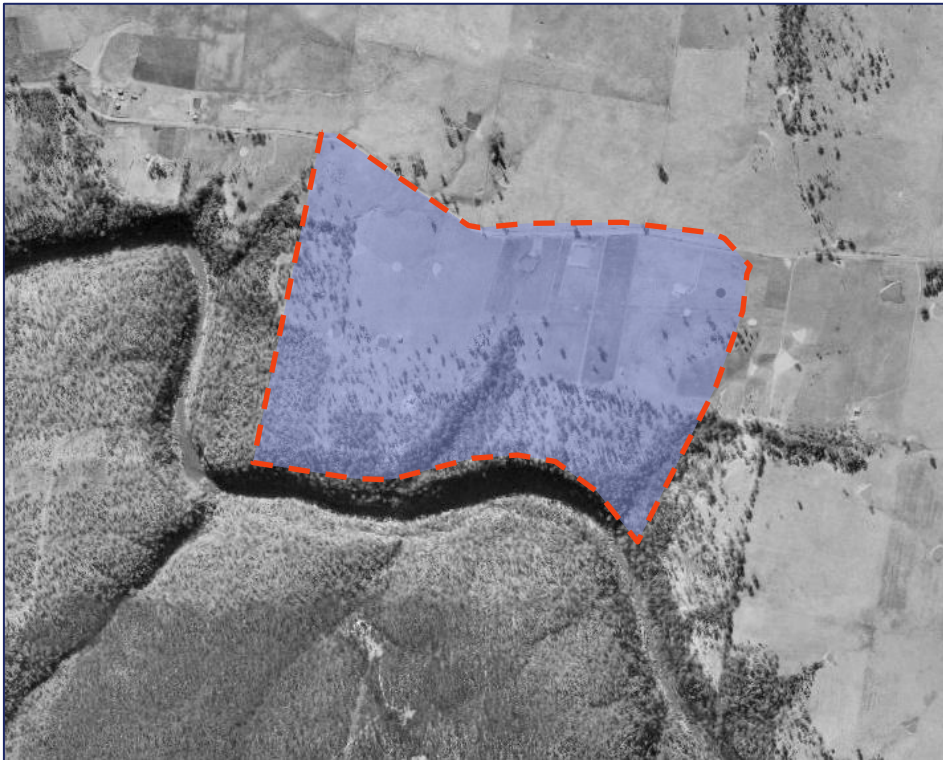
### **3.6 Aerial photographs**

A series of historical aerial photographs of the site were reviewed as part of the assessment.

Figure 1 to Figure 8 show the aerial photographs from 1969 to 2022. A summary of the observation is as follows:

- 1969 – Based on the earliest available aerial photograph, the site appears to be generally undeveloped greenfield area with a few dams noted in the photo. The present Berwick Park and Wilton Park roads can be seen along the northern boundary of the site
- 1969 to 1975 – Some dwellings appeared to have been constructed on some of the lots. Some more dams (presumably man-made) have been formed
- 1975 to 1980 – No major changes observed
- 1980 to 2004 – More dwellings appeared to have been constructed. These dwellings are consistent with those observed in the present days
- 2004 to present – No major changes observed.

We note that land use appears to have been largely similar over the years with no major modifications observed.



**Figure 1 – Aerial Image of the Site in 1969 (source: NSW Historical Imagery Viewer)**





**Figure 2 – Aerial Image of the Site in 1975 (source: NSW Historical Imagery Viewer)**



**Figure 3 – Aerial Image of the Site in 1980 (source: NSW Historical Imagery Viewer)**





Figure 4 – Aerial Image of the Site in 2004 (source: NSW Historical Imagery Viewer)



Figure 5 – Aerial Image of the Site on captured on 10 Feb 2010 (source: Nearmap)





Figure 6 – Aerial Image of the Site on captured on 6 June 2015 (source: Nearmap)



Figure 7 - Aerial Image of the Site on captured on 5 Sep 2020 (source: Nearmap)





**Figure 8 - Aerial Image of the Site on captured on 16 July 2022 (source: Nearmap)**

## 4. Opinion

### 4.1 Suitability for industrial development

On the basis, of the preliminary assessment undertaken, it is our opinion that the area investigated is suitable for industrial development. As would be usual for such a development, geotechnical advice regarding the civil works (earthworks specification, retaining wall design, etc.) should be sought prior to further design and construction stages. Geotechnical elements that need to be addressed at future design and construction stages are presented in Section 4.3.

We consider these will be able to be addressed by typical engineering and construction controls.

We note the potential influence of mine subsidence on the site. This shall be considered accordingly in the design stages (e.g., through appropriate foundations scheme or incorporation of structural tolerance in the design). Further comments on mine subsidence and applicable guidelines are discussed in Section 4.2.

### 4.2 Comments on mine subsidence

Based on the NSW Planning Portal, we note that while the site falls within the mine subsidence district, the different lots within the site are subject to different mine subsidence development guidelines. The relevant guideline for the different lots is summarized below:

Lot	Applicable guideline in accordance with NSW Planning Portal
10 Berwick Park Road	8
20 Berwick Park Road	
30 Berwick Park Road	
25 Wilton Park Road	
45 Wilton Park Road	
55 Wilton Park Road	
75 Wilton Park Road	6
85 Wilton Park Road	
95 Berwick Road	

<sup>1</sup> See below for development restrictions imposed by guidelines

We note the following from the guidelines.

#### **Guideline 6:**

*Applies to properties in mine subsidence districts assessed by Subsidence Advisory (SA) NSW as likely to be undermined in the future with subsidence-induced ground movements up to and including:*

- *Maximum Horizontal Ground Strain: 2mm/m tensile or compressive*
- *Maximum Tilt: 4mm/m*
- *Minimum Radius of Curvature: 10km (hogging and sagging).*

and

*Proposed improvements that do not comply with the guideline for the property must be assessed by SA NSW risk engineers on merit. This includes higher density residential development, commercial buildings and buildings more than two storeys*

#### **Guideline 8:**

*No restriction on development*

### **4.3 Geotechnical Risks**

We have identified the following geotechnical risks that will need to be addressed as part of the further design and construction associated with the proposed development. However, we do not consider them to affect the ability of the site to be developed for industrial purposes.

- Cliff regression and stability along the Nepean River and creeks:
  - Cliff regression may occur over a period of time. Appropriate setbacks will need to be included
  - Where the proposed development is close to the cliff (considering appropriate setbacks), cliff stability shall be checked.
- Excessive settlement due to soft ground:
  - Developments or earthworks on soft ground (i.e., in the vicinity of existing dams and waterbodies shall be designed to allow for predicted settlements within these areas. Else, alternative design (i.e., suspended structures) shall be considered.
- Disturbed ground:
  - Earthworks in areas of disturbed ground (e.g., dams, small embankments) will need to consider the effect of the disturbed ground on the proposed development.
- Differential settlement due to potentially varying underlying ground stiffness associated with rock outcrops and undulating terrain:

- Due to the undulating terrain, it is expected that extensive earthworks may be required (depending on the proposed development footprint). Coupled with the observed rock outcrops across the site, there may be a potential for differential settlement between structures founded on material of different stiffness (e.g., rock with relatively higher stiffness and fill, which is relatively less stiff).
- Settlement due to mine subsidence:
  - Where the proposed development is expected to be affected by future mine subsidence, detailed assessments shall be carried out and appropriate measures be incorporated in the design to tolerate the predicted movement. We understand that a mine subsidence assessment has been undertaken for the proposed development by Mine Subsidence Engineering Consultants dated September 2022 (Report No.: MSEC1291).

**Yours Sincerely**



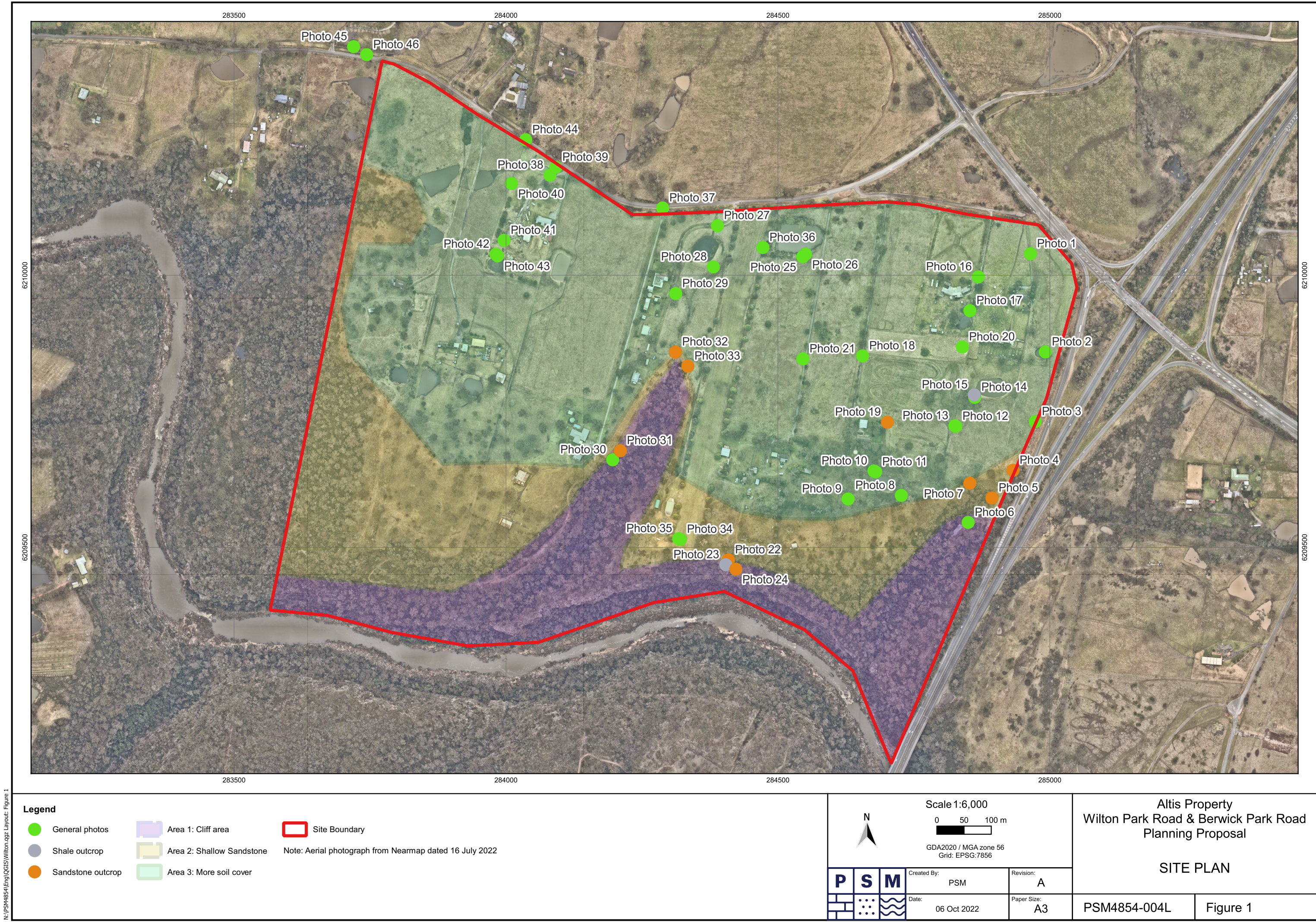
**KELVIN LIM**  
**SENIOR GEOTECHNICAL ENGINEER**



**DAVID PICCOLO**  
**PRINCIPAL**

**Encl.**    Figure 1            Locality Plan  
             Appendix A       Selected Site Photographs







# **Appendix A**

## **Selected Site Photographs**



Photo 1: General view of the site at 30 Berwick Park - looking South-East



Photo 2: General view of the dam at 30 Berwick Park



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Photo 3: 30 Berwick Park - ground sloping upwards and towards existing Hume Motorway



Photo 4: Manmade sandstone blocks embankment at the existing Hume Motorway



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Photo 5: Sandstone outcrop at the waterway towards Nepean River at 30 Berwick Park



Photo 6: Pond and waterbodies towards the Nepean River at 30 Berwick Park



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Photo 7: Sandstone outcrop and sloping ground upwards and towards the north at 30 Berwick Park



Photo 8: General view of the dam embankment at 10 Berwick Park



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Photo 9: Thick vegetation close to the Nepean River at 10 Berwick Park



Photo 10: General view of the Dam at 10 Berwick Park



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Photo 11: Lateritic soil near the Dam at 10 Berwick Park



Photo 12: General view of the ground sloping upwards and towards north at 30 Berwick Park



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Photo 13: General view (looking East) of the ground sloping down towards Nepean River (on the right)



Photo 14: General view of the dam at 30 Berwick Park



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Photo 15: Shale outcrop around the dam at 30 Berwick Park



Photo 16: General view of the site at 20 Berwick Park - looking West



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Photo 17: General view of the dam at 20 Berwick Park



Photo 18: General view of the site at 10 Berwick Park - Looking South-East



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Photo 19: Sandstone outcrop at 10 Berwick Park



Photo 20: General view of the dam embankment at 20 Berwick Park



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Photo 21: General view of 25 Wilton Park - Looking South-West



Photo 22: Sandstone outcrop at 25 Wilton Park, close to Nepean River



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Photo 23: Shale boulder at 25 Wilton Park, close to Nepean River



Photo 24: General view of the sandstone cliff across from 25 Wilton Park



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Photo 25: General view of the dam at 25 Wilton Park



Photo 26: Soft ground near the dam at 25 Wilton Park



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Photo 27: General view of the dam at 45 Wilton Par with a waterway flowing towards the dam



Photo 28: General view of the dam embankment at 45 Wilton Park



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Photo 29: Saturated and soft ground around the waterways at 45 Wilton Park



Photo 30: General view of the ground sloping downwards towards the creek at 45 Wilton Park



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Photo 31: Sandstone outcrop near the creek at 45 Wilton Park



Photo 32: General view of the sandstone outcrop around 45 Wilton Park



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Photo 33: Steep slope with sandstone outcrop at the creek at 45 Wilton Park



Photo 34: General view of the site at 45 Wilton Park - looking North



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Photo 35: General view of the site at 45 Wilton Park looking south towards Nepean River



Photo 36: General view of the dam embankment at 25 Wilton Park



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Photo 37: General view of the site at 55 Wilton Park, looking south



Photo 38: General view of the dam at 75 Wilton Park, near Wilton Park Road



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Photo 39: Waterway feeding into the dam at 75 Wilton Park



Photo 40: The dam at 85 Wilton Park, viewed from 75 Wilton Park



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Photo 41: General view of the site at 75 Wilton Park. Stockpile of materials observed



Photo 42: General view of the dam at 75 Wilton Park towards the back of the lot



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Photo 43: Shale fill at the dam embankment at 75 Wilton Park



Photo 44: General view of the site at 85 Wilton Park



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Photo 45: Shale outcrop close to 95 Wilton Park



Shale outcrop close to 95 Wilton Park



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