Jacfin Pty Ltd

Geomorphological Assessment: Proposed Subdivision - 2B Adlington Road, Kemps Creek, NSW

martens consulting engineers

ENVIRONMENTAL

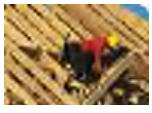
WATER

WASTEWATER

GEOTECHNICAL

CIVIL

PROJECT MANAGEMENT



P1907485JR01V02
October 2019

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All enquiries regarding this project are to be directed to the Project Manager.

Contents

1 Background

1.1 Scope of Study

Martens and Associates have prepared this geomorphological assessment for Jacfin Pty Ltd (the Client) to support a proposed subdivision located at Lot A DP 392643 and Lot 21 DP 1010514, being 2B Adlington Road, Kemps Creek and 1-9 Greenway Place Horsley Park NSW respectively.

Specifically, this assessment provides commentary regarding two drainage features (see site plan Attachment A) as to whether or not these constitute a "watercourse" within 40 m of the proposed development, in accordance with the definition of "watercourses" or "rivers" given in the *Water Management Act 2000* (NSW) (*'WM Act 2000'*).[1] This is to determine if a referral to the Natural Resources Access Regulator and a controlled activity approval will be required for the proposed development. We note that the 1:25,000 Prospect topographical map appears to show a 'blue line' (i.e. a mapped watercourse) in the vicinity of Drainage Feature A, however there is no such blue line in the vicinity of Drainage Feature B.

The assessment utilises the nine-part test given in *Silva v Ku-ring-gai Council* [2009] NSWLEC 1060 (*'Silva'*).[2]

1.2 Proposed Development

The proposed development consists of a subdivision to create seventeen (17) new lots, road reserves and associated services. A site plan showing the proposed layout of the subdivision is provided in Attachment A.

1.3 Previous Reports

The Client has received information from their ecologist (Dominic Fanning of Gunninah) who has expressed the view that there are no 'watercourses' or 'rivers' at the site as defined in the *WM Act 2000*, based on his site inspection. The ecologist also noted no defined waterfront land with respect to the definition given in the *WM Act 2000*.[3]

[1] *Water Management Act 2000* (NSW) s4 (*'WM Act 2000'*).
[2] *Silva v Ku-ring-gai Council* [2009] NSWLEC 1060 at [56] (*'Silva'*).
[3] *WM Act 2000* above n 1.

2 Hydrogeomorphological Assessment

2.1 Site Inspection

A site inspection was undertaken by Martens on 18 October 2019 and included a walkover inspection of both drainage features to determine if either drainage feature had characteristics of a watercourse within the development or 40 m from the development area. Photographs from the site inspection are provided at Attachment B.

2.2 Summary of Drainage Features

Two drainage features are considered in this assessment as marked on the attached site plan in Attachment A:

- Drainage Feature A. This drains the north-eastern portion of Lot A DP 392643 and parts of the neighbouring lots to the north and east. It has a catchment of approximately 10 – 12 ha to a point 40 m downslope of the proposed subdivision boundary of Lot 11.

- Drainage Feature B. This drains the south-eastern portion of Lot A DP 392643 and Lot 21 DP 1010514 as well as parts of road reserve to the south of the site and parts of the Greenway Place road reserve.

2.3 Nine Part Assessment as Per *Silva v Ku-Ring-gai Council* [2009]

Both drainage lines are assessed as per the nine-part test given in *Silva*.[4] This is summarised in Table 1.

[4] *Silva,* above n 2.

Table 1: Summary of nine-part assessment of drainage features.

Characteristic as per *Silva*	Drainage Feature A	Drainage Feature B
i. Are there definable channel banks and a channel bed?	No definable bed or banks within the development or within 40 m downslope of proposed development. Drainage feature a wide depression.	No definable bed or banks within the development or within 40 m downslope of proposed development. Drainage feature a wide depression.
ii. Are there fluvial bedforms e.g. Pools, riffles, sediment point bars, etc. and if so what are they?	No fluvial bedforms noted within the development or 40 m downslope of the development. Grassed depression.	No fluvial bedforms noted within the development or 40 m downslope of the development. Grassed depression.
iii. Is there are evidence for substantial erosion from water inflow within the drainage feature?	No evidence for substantial erosion from water inflow within the development or 40 m downslope of the development. Erosion observed is attributed to long-term historical land clearing, site agricultural practices and some dryland salinity related salt scalding.	No evidence for substantial erosion from water inflow within the development or 40 m downslope of the development. Some minor erosion in the drainage feature has occurred as a result of cattle being on the site.
iv. Are there any spring lines that may indicate seasonally intermittent or perennial flow?	No evidence of spring lines noted within the development or 40 m downslope of the development.	No evidence of spring lines noted within the development or 40 m downslope of the development.
v. Is the catchment large enough to sustain perennial or intermittent groundwater flow?	Catchment estimated as 10 – 12 ha approximately to within 40 m downslope of the development. In my opinion any shallow groundwater is likely to consist of only ephemeral flows above bedrock immediately following rain. Permanent groundwater table is likely to be at considerable depth and hydraulically linked to Ropes Creek approximately 1.2 km west of the drainage feature and > 10 m below the existing ground level of the development.	Catchment estimated as 8 – 12 ha approximately to within 40 m downslope of the development. In my opinion any shallow groundwater is likely to consist of only ephemeral flows above bedrock immediately following rain. Permanent groundwater table is likely to be at considerable depth and hydraulically linked to Ropes Creek approximately 1.2 km west of the drainage feature and > 10 m below the existing ground level of the development.

Characteristic as per *Silva*	Drainage Feature A	Drainage Feature B
vi. Are there any indicators of prolonged wetness within the drainage feature?	Site inspections noted no indicators of prolonged wetness within the development or within 40 m downslope of the development.	Site inspections noted no indicators of prolonged wetness for majority of length of drainage feature within the development or within 40 m downslope of the development. Standing water was noted at the southern site boundary as a result of previous works to raise the access road to the south of the site. Drainage pipes under the access are considered to be poorly aligned, causing the water to become trapped on the upslope side of the road. A realignment of these pipes would correct the issue.
vii. If surface flow is present, is it continuous and how extensive across the base of the drainage feature is it?	No surface flows noted within the development or 40 m downslope of the development at the time of site inspection.	No surface flows noted within the development or 40 m downslope of the development at the time of site inspection.
viii. Are there any visible aquatic habitats that might sustain aquatic fauna?	No evidence of visible aquatic habitats or aquatic fauna within the development or 40 m downslope of the development. The existing dam on proposed Lot 17 is approximately 250 m downstream of the proposed development.	No evidence of visible aquatic habitats or aquatic fauna within the development or 40 m downslope of the development.
ix. Are there any visible aquatic flora present that would require periods of uninterrupted moisture?	No evidence of visible aquatic flora present which would require periods of uninterrupted moisture within the development of 40 m downslope of the development. Grasses only.	No evidence of visible aquatic flora present which would require periods of uninterrupted moisture within the development of 40 m downslope of the development. Grasses only.
WM Act 2000	No evidence of bed or banks to indicate "waterfront land" as per the definition given in the *WM Act 2000* within the development or 40 m downslope of the development.	No evidence of bed or banks to indicate "waterfront land" as per the definition given in the *WM Act 2000* within the development or 40 m downslope of the development.
Conclusion	Drainage Feature A is not a watercourse as defined in the *WM Act 2000* or by the nine-part test given in *Silva* based on site observations.	Drainage Feature B is not a watercourse as defined in the *WM Act 2000* or by the nine-part test given in *Silva* based on site observations.

3 Opinion

Based on the nine-part assessment in Table 1 and site observations, we conclude that neither Drainage Feature A nor Drainage Feature B is a watercourse within the development and within 40 m of the development boundary as defined in *Silva* or in the *WM Act 2000*.[5] Further, we conclude that there is no "waterfront land" as defined in the *WM Act 2000*.

[5] *Silva,* above n 2; *WM Act 2000,* above n 1.

4 References

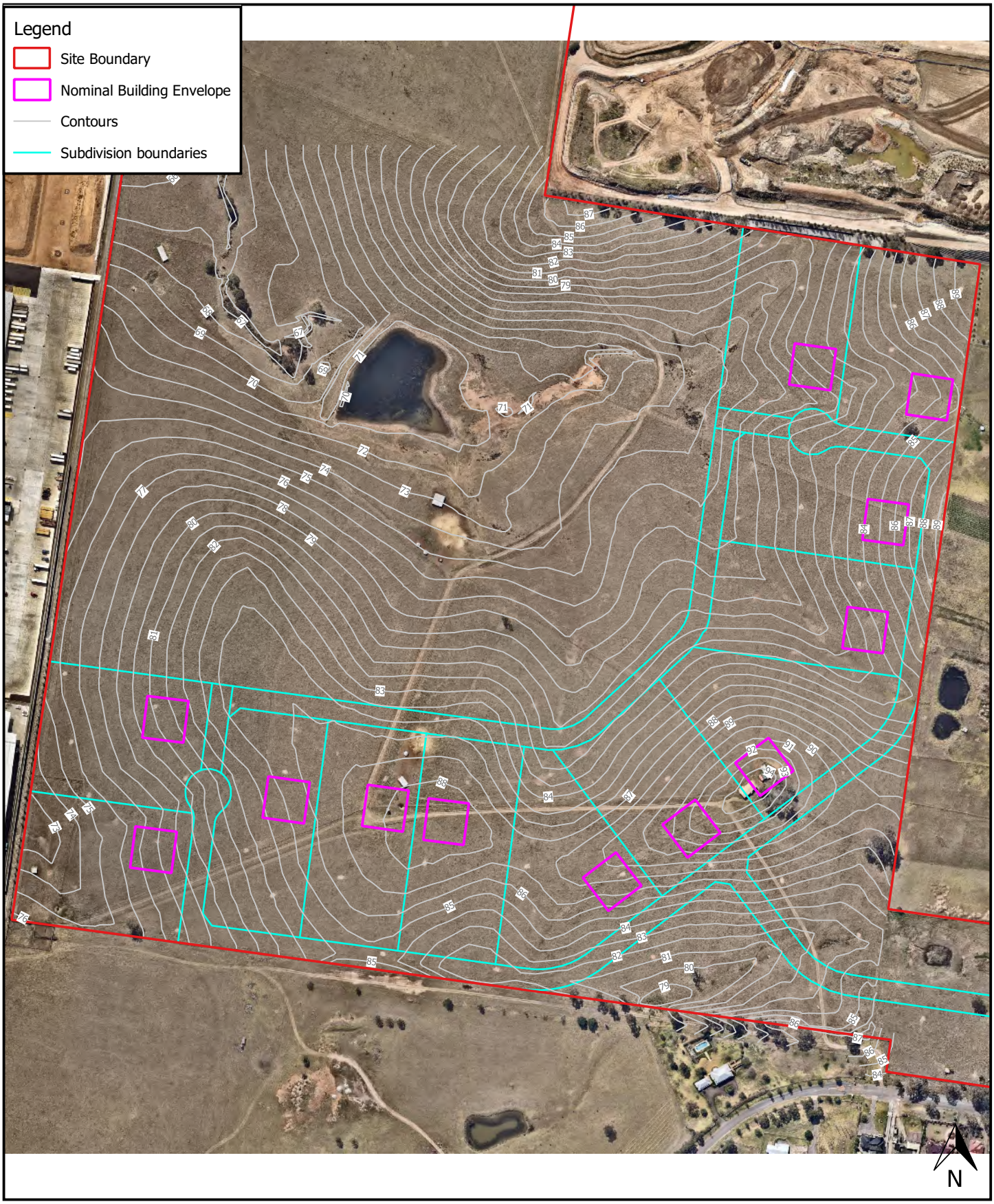
https://www.austlii.edu.au (Australasian Legal Information Institute website, 23/10/2019).

NSW Land and Property Information (2017) *Prospect 1:25,000 Topographic Map 9030-2N.*

Silva v Ku-Ring-Gai Council (2009) NSWLEC 1060 (accessed from Australasian Legal Information Institute website, 23/10/2019).

Water Management Act 2000 (NSW) (accessed from Australasian Legal Information Institute website, 23/10/2019).

5 Attachment A – Site Plans



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Aerial Photo: September 2019

Map Title / Figure:

Proposed Subdivision Layout

EN01	Map
2B Adlington Road, Kemps Creek	Site
Geomorphological Assessment	Project
Site Plans	Sub-Project
Jacfin Pty Ltd	Client
28/10/2019	Date

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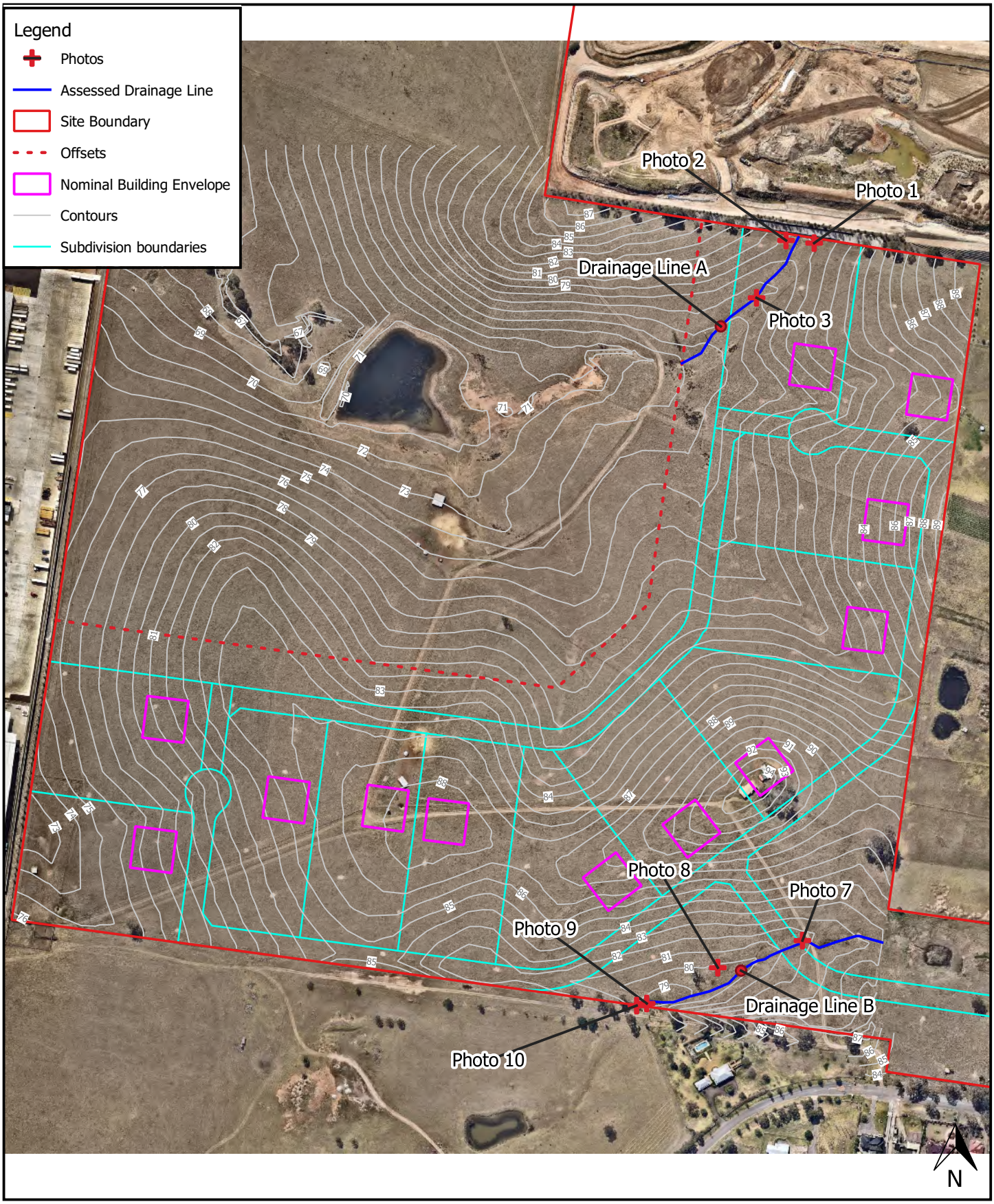
Environment | Water | Geotechnics | Civil | Projects

Project No: P1907485 Model: P1907485QGIS01 Projection: MGA 56 Map Set: MS01-R01



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Aerial Photo: September 2019

Map Title / Figure:

Geomorphological Assessment

EN02	Map
2B Adlington Road, Kemps Creek	Site
Geomorphological Assessment	Project
Site Plans	Sub-Project
Jacfin Pty Ltd	Client
28/10/2019	Date

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Project No: P1907485 Model: P1907485QGIS01 Projection: MGA 56 Map Set: MS01-R01

Project No: P1907485 Model: P1907485QGIS01 Projection: MGA 56 Map Set: MS01-R01

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Map Title / Figure:

Historical Aerial Photo - November 2016

EN03	Map
2B Adlington Road, Kemps Creek	Site
Geomorphological Assessment	Project
Site Plans	Sub-Project
Jacfin Pty Ltd	Client
28/10/2019	Date

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0 50 100 150 200 250 m

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Map Title / Figure:

Historical Aerial Photo -February 2014

EN04	Map
2B Adlington Road, Kemps Creek	Site
Geomorphological Assessment	Project
Site Plans	Sub-Project
Jacfin Pty Ltd	Client
28/10/2019	Date

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Project No: P1907485 Model: P1907485QGIS01 Projection: MGA 56 Map Set: MS01-R01

Project No: P1907485 Model: P1907485QGIS01 Projection: MGA 56 Map Set: MS01-R01

0 50 100 150 200 250 m

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Map Title / Figure:

Historical Aerial Photo - April 2010

EN05	Map
2B Adlington Road, Kemps Creek	Site
Geomorphological Assessment	Project
Site Plans	Sub-Project
Jacfin Pty Ltd	Client
28/10/2019	Date

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6 Attachment B – Site Photographs

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Martens & Associates Pty Ltd ABN 85 070 240 890		**Environment | Water | Wastewater | Geotechnical | Civil | Management**	
Drawn:	MGD	**Photograph of Drainage Depression A – Looking downslope and south-west towards proposed boundary of Lot 12**	**PHOTO 1**
Approved:	DMM		
Date:	23.10.19		
Scale:	nts		Job No: P1907485

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Martens & Associates Pty Ltd ABN 85 070 240 890		**Environment | Water | Wastewater | Geotechnical | Civil | Management**	
Drawn:	MGD	**Photograph of Drainage Depression A – Looking upslope and north-east towards boundary with Lot 103 DP 1214912 (6 Johnston Crescent, Horsley Park, NSW)**	**PHOTO 2**
Approved:	DMM		
Date:	23.10.19		
Scale:	nts		Job No: P1907485

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Martens & Associates Pty Ltd ABN 85 070 240 890		**Environment | Water | Wastewater | Geotechnical | Civil | Management**	
Drawn:	MGD	**Photograph of Drainage Depression A – Looking downslope and south-west in the vicinity of the proposed boundary of Lots 12 and 17**	**PHOTO 3**
Approved:	DMM		
Date:	23.10.19		
Scale:	nts		Job No: P1907485

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Martens & Associates Pty Ltd ABN 85 070 240 890		**Environment | Water | Wastewater | Geotechnical | Civil | Management**	
Drawn:	MGD	**Photograph of Drainage Depression B – Looking downslope and south in the vicinity of the proposed access road between Lots 13 and 14**	**PHOTO 7**
Approved:	DMM		
Date:	24.10.19		
Scale:	nts		Job No: P1907485

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Martens & Associates Pty Ltd ABN 85 070 240 890		**Environment | Water | Wastewater | Geotechnical | Civil | Management**	
Drawn:	MGD	**Photograph of Drainage Depression B – Looking downslope and south-west approximately 30 m upslope of the site boundary**	**PHOTO 8**
Approved:	DMM		
Date:	24.10.19		
Scale:	nts		Job No: P1907485

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Martens & Associates Pty Ltd ABN 85 070 240 890		**Environment | Water | Wastewater | Geotechnical | Civil | Management**	
Drawn:	MGD	**Photograph of Drainage Depression B – Looking downslope in the vicinity of the site boundary showing standing water ponded behind access (due to poorly sited drainage pipes**	**PHOTO 9**
Approved:	DMM		
Date:	24.10.19		
Scale:	nts		Job No: P1907485

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Martens & Associates Pty Ltd ABN 85 070 240 890		**Environment | Water | Wastewater | Geotechnical | Civil | Management**	
Drawn:	MGD	**Photograph of Drainage Depression B – Looking downslope from the site boundary showing no characteristics of a watercourse**	**PHOTO 10**
Approved:	DMM		
Date:	24.10.19		
Scale:	nts		Job No: P1907485