Douglas PARTNERS | GROUNDED EXPERTISE

JJ Cobbitty Development Pty Ltd
C/- Always Consultancy Pty Ltd
Level 6, 5 Martin Place
SYDNEY, NSW 2000

Attention: Xudai Sun
Email: XSun@alwaysconsultancy.com.au

Project 92225.10
27 October 2025
R.001.Rev3
HDS

Geotechnical Review
South Creek West, Sub-Precinct 5, Cobbitty
670 The Northern Road, Cobbitty NSW

1. Introduction

This report presents a geotechnical review undertaken by Douglas Partners Pty Ltd (Douglas) for a proposed residential sub-division at 670 The Northern Road, Cobbitty, also referred to as 'Cobbitty Sub-Precinct 5', in the 'South Creek West Land Release Area'. The geotechnical review was commissioned in an email dated 29 September 2025 by Mr. Xudai Sun of Always Consultancy Pty Ltd on behalf of JJ Cobbitty Development Pty Ltd and revised in accordance with our proposal 92225.14.P.001.Rev0, dated 18 July 2025. It is understood that this review will accompany a 'Planning Proposal' for a proposed amendment to the State Environmental Planning Policy (Precincts – Western Parkland City) 2021 (Parkland City SEPP).

The scope of work included a site walkover of steep slopes within the south-eastern portion of the proposed development area, a review of the updated 'indicative layout plan' for the development together with previous geotechnical investigation and assessment reports prepared for the development, and preparation of an opinion on whether the steep hillside slopes can be made suitable for residential development.

2. Planning Proposal Preamble (Supplied)

The planning proposal is seeking to re-zone 172.74 hectares (ha) of land, which forms 57% of the development area known as 'Precinct 5'. The remainder of Precinct 5 (130.41 ha, 43%) is owned by a separate landowner, which is not the subject of the Planning Proposal. The intended outcome of the planning proposal is to make the following amendments to the Parkland City SEPP:

- Incorporate the site on the 'Land Application Map' for the Parkland City SEPP;
- Re-zone the land, to include:
    - 'C2': Environmental Conservation,

- ‘C4’: Environmental Living,
- ‘B4’: Mixed Use,
- ‘R2’: Low Density Residential (‘Band 1’ and ‘Band 2’),
- ‘R3’: Medium Density Residential (‘Band 1’),
- ‘RE1’: Public Recreation, and
- ‘SP2’: Infrastructure.

- Introduce the following building heights:
  - ‘Low-density residential’: 9 metres, allowing for developments of up to two storeys height, and
  - ‘Medium-density residential’: 12 metres, allowing for developments of up to three storeys height.

The planning proposal is supported by a revised ‘indicative layout plan’ (ILP) for approximately 2,650 dwellings within a net developable area of 101.26 hectares, together with ‘active’ and ‘passive’ open spaces.

The revised ILP also seeks to incorporate the Government Architect’s ‘Connecting with Country’ design framework, including protection of ridgelines, creeks and ‘view corridors’, celebrating the riparian corridors and waterways through incorporation into open space, and positioning ‘key uses’ on flatter parts of the site to minimise cut and fill earthworks.

The proposed amendments to the Parkland City SEPP seek to transition the existing rural landscape into a residential community. This is in keeping with the vision and aspirations of the ‘Western Sydney Growth Areas’ program of the NSW Government, which includes a diverse range of residential housing types for south-western Sydney.

3. Proposed Development

The supplied Indicative Layout Plan (ILP) for the development (prepared by Design and Planning Pty Ltd) is titled ‘Draft Indicative Layout Plan, Cobbitty’, drawing reference ‘AWCCO-2b-001-7’, Rev F, dated 23 October 2025.

A sub-area of the site near the southern development boundary, adjacent to Lot 1 in deposited plan DP1273487 (where two water storage reservoirs have been constructed), is denoted on the ILP as ‘Hilltop Investigation Area’ and is bounded to the west by a ‘collector road’ and by ‘local roads’ to both the north and north-east.

In accordance with the revised ILP (Rev F), the footprint of the ‘Hilltop Investigation Area’ covers areas of proposed ‘Environmental Living’ and ‘Low Density Residential’ land use and corresponds with slope stability risk Zones 2 and 3 set out in our previous report (Douglas, 2023b – refer

Section 4.1). Indications of previous soil movement (e.g. sliding or creep) were observed in these zones, with the thickness of movement-affected soils (colluvium) of up to 0.9 m.

Based on an assessment of historical slope instability, geological mapping, subsurface investigations, and a qualitative risk assessment, the assessed slope stability risk for these slope stability risk Zones 2 and 3 range between 'Moderate risk' for Zone 2 and 'High to Very High risk' for Zone 3.

4. Background Information

4.1 Previous Reports

Geotechnical, groundwater and salinity investigations have previously been carried out for the proposed development area (or broader areas incorporating 'Cobbitty Sub-Precinct 5'), including:

- *'Report on Land Capability and Contamination Assessment, Oran Park Precinct, Oran Park and Cobbitty, Report 40740'*, dated February 2007 (Douglas, 2007);
- *'Report on Preliminary Geotechnical and Salinity Assessment, Proposed Rezoning, Sub Precinct 5, South Creek West, NSW, Report 92225.02.R.001.Rev3'*, dated December 2022 (Douglas, 2022a);
- *'Report on Preliminary Groundwater Investigation, Proposed Rezoning, 621-705 The Northern Road, Cobbitty NSW, Report 92225.04.R.002.Rev4'*, dated December 2022 (Douglas, 2022b);
- *'Report on Salinity Investigation and Salinity Management Plan, Proposed Rezoning, Sub Precinct 5, South Creek West, NSW, Report 92225.05.R.001.Rev0',* dated March 2023 (Douglas, 2023); and
- *'Report on Stability Assessment, Proposed Residential Subdivision, South Creek West, Precinct 5, Cobbitty, Report 92225.06.R.002.Rev3'*, dated October 2025 (Douglas, 2025).

The steeper hillside slopes within the south-eastern part of the site were assessed (in Douglas, 2022a) to have 'intermediate' or 'major' slope constraints to development (delineated as either slope stability risk zones 'Zone 2' or 'Zone 3'). Further site investigations (including site walkover mapping and test pits) were carried out in response to a Camden Council request for information (RFI) in August 2022, to "*delineate slope stability risk 'Zone 2' and 'Zone 3' areas of the site which may be subject to existing or potential slope constraints, assess the risk of slope instability, and to provide recommendations and guidelines for residential development*" (reported in (Douglas, 2025)).

The zones of slope constraints to development near Lot 1 in DP1273487 (i.e. the ridgeline with the water storage reservoirs) are shown together with the revised indicative layout plan on Drawing 1, which includes calculated landslide travel distance runout limits. Downslope boundaries of the three slope constraint zones have been adjusted relative to previous revisions of this report, based on additional site investigation data including further intrusive site investigations and geological mapping.

The land uses previously proposed for slope stability risk zone 3 ('major' slope constraints: in Douglas, 2025) mainly included 'open space', and on this basis it was considered that landscaping and use as 'open space' was appropriate within this zone, provided slope integrity was maintained, and erosion control measures were implemented.

4.2 Recommended Geotechnical Remediation and Hazard Reduction Works

The stability assessment report (Douglas, 2025) recommended geotechnical remediation and hazard reduction works to be carried out in Zone 2, to reduce and/or maintain the current risk of slope instability, and to facilitate residential development within the steep hillside, whilst keeping the risk of slope instability within acceptable risk levels.

The remediation and hazard reduction works included:

- Removal of all movement-affected materials down to the top of rock, installation of sub-surface drainage to control soil pore water pressures, followed by replacement with 'Level 1' engineered fill;
- Improvements to surface drainage for controlled disposal of stormwater to the Council stormwater system;
- Implement erosion control (soil stabilisation) measures in reserves, parks and other green spaces (such as retention of existing trees and planting of additional deep-rooted shrubs or trees);
- Transfer of structural loads (such as from dwellings) to a uniform bearing stratum of weathered bedrock; and
- Ongoing site maintenance and inspections for the developed lots and infrastructure within the steep hillside (e.g. property owners for individual Lots, and by Council within public reserves).

Previously the land use within Zone 3 was mainly 'Open Space'. As such Douglas did not provide rectification approaches as it was not necessary to support the 'Open Space' rezoning.

4.3 Conclusion for Proposed Re-Zoned Land Use

The stability assessment report (Douglas, 2025) concluded that the lower and mid-slopes within the southern part of the site (inclusive of Zones 1 and 2) are considered suitable for residential development (from a geotechnical perspective) provided that design and construction is undertaken in accordance with good practice for hillside construction and with the recommendations presented in the report. Additional work was recommended to be carried out to provide further inputs to design and construction, including assessment of potential landslide run-out distances and delineation of the downslope extent of movement-affected areas.

The report concluded that the upper areas of hillside slopes (Zone 3) have major constraints to residential development due to the potential for instability (or re-activation of previous instability), and that slope stabilisation measures will be required for residential development together with implementation of engineering works, both of which may need to be substantial.

5. Current Site Observations

A site walkover was carried out by the undersigned on 21 March 2024, viewed both from the ridgeline crest (adjacent to the water reservoirs) and within the areas of steep hillside slopes denoted in our previous report as being areas of 'intermediate' or 'major' slope constraints (i.e. slope stability risk zones 2 and 3). African olives still cover most of the movement-affected area of steep hillside slope.

No areas of new slope instability or indications of changes to existing movement-affected areas were observed during the site walkover.

6. Comments

As the steep slopes in the site and adjacent areas are unchanged since the preparation of our previous reports, it is considered that the subsurface investigation data and site observations presented in our previous report are still valid (including geological mapping observations and subsurface information from test pits (Douglas, 2025)), as are the interpreted terrain units presented in the geotechnical model, and the recommended geotechnical remediation and hazard reduction measures.

In a few areas, the calculated landslide runout distance (for 90% of all slides, shown on Drawing 1) extends downslope of the Zone 2 boundary and into areas likely to be nominated for urban building structures and infrastructure. This indicates that earthworks will be required in the upslope Zone 3 areas so that slope instability risks can be mitigated for the proposed urban building envelopes.

7. Conclusion

It is our opinion that:

- the conclusions of the stability assessment report (Douglas 2025) are still valid for the current revision of the ILP;
- the conclusion of the stability assessment report that the lower and mid-slopes within the site can be made suitable for the proposed residential development (inclusive of slope stability risk zones 1 to 2), subject to the implementation of remediation and hazard reduction works, is still valid;
- the upper hillside slope area can be made suitable for residential development following further geotechnical site investigations and the implementation of necessary engineering works;
- engineering works (such as earthworks and construction of retaining walls) will be required upslope of proposed urban building envelopes in Zone 2 areas (i.e. engineering works needed in Zone 3), to mitigate slope instability risks. There will be significant earthworks and subsurface drainage required as part of rectification of Zone 3. Works in Zone 3 will abut Sydney Water's land and will need to support the Sydney Water land. Douglas recommends early engagement with Sydney Water regarding these works;

- the land re-zoning proposal (to residential land use) is supported, with supplementary geotechnical site investigations ongoing (i.e. monitoring, modelling and further analysis) to confirm the engineering works and development controls required to be implemented. The purpose of the controls is to ensure the stability of adjoining land is maintained (including both water reservoirs in Lot 1 DP1273487). It is noted that development consent will also likely be subject to Sydney Water approval. This may include the need for necessary earthworks and/or engineering works to ensure that development in the steep hillside does not inadvertently affect the Sydney Water site; and

- the supplementary geotechnical works scope still to be completed includes a long-term monitoring program (through to December 2026) of measurement and monitoring of inclinometers and standpipe piezometers.

8. References

Douglas. (2007). *Report on Land Capability and Contamination Assessment, Oran Park Precinct, Oran Park and Cobbitty.* Macarthur: Douglas Partners Pty Ltd, Report 40740, dated 28 February 2007.

Douglas. (2022a). *Report on Preliminary Geotechnical and Salinity Assessment, Proposed Rezoning, Sub Precinct 5, South Creek West, NSW.* Macarthur: Douglas Partners Pty Ltd, Report 92225.02.R.001.Rev3, dated 8 December 2022.

Douglas. (2022b). *Preliminary Groundwater Investigation, Proposed Rezoning, 621-705 The Northern Road, Cobbitty, NSW.* Macarthur: Douglas Partners Pty Ltd, Report 92225.04.R.002.Rev4, dated 22 December 2022.

Douglas. (2023). *Report on Salinity Investigation and Salinity Management Plan, Proposed Rezoning, Sub Precinct 5, South Creek West, NSW.* Macarthur: Douglas Partners Pty Ltd, Report 92225.05.R.001.Rev0, dated 13 March 2023.

Douglas. (2025). *Report on Stability Assessment, Proposed Residential Subdivision, South Creek West, Precinct 5, Cobbitty.* Macarthur: Douglas Partners Pty Ltd, Report 92225.06.R.002.Rev3, dated 27October 2025.

9. Limitations

Douglas Partners Pty Ltd (Douglas) has prepared this revised report for this project at 670 The Northern Road, Cobbitty NSW in accordance with Douglas' latest proposal dated 18 July 2025 and acceptance received via email on 29 September 2025 from Mr. Xudai Sun of Always Consultancy Pty Ltd on behalf of JJ Cobbitty Development Pty Ltd. The work was carried out under Douglas' Engagement Terms. This report is provided for the exclusive use of JJ Cobbitty Development Pty Ltd for this project only and for the purposes as described in the report. It should not be used by or be relied upon for other projects or purposes on the same or another site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of Douglas, does so entirely at its own risk and without recourse to Douglas for any loss or damage. In preparing this report Douglas has necessarily relied upon information provided by the client and/or their agents

The opinion presented in the report is based on a site walkover in 2024 and the results of previous site investigations, which are indicative of the sub-surface conditions on the site only at the specific sampling and/or testing locations, and then only to the depths investigated and at the time the work was carried out. Sub-surface conditions can change abruptly due to variable geological processes and also because of human influences. Such changes may occur after Douglas' field testing has been completed.

Douglas' advice and opinion is based upon the conditions encountered during the previous subsurface investigation. The accuracy of the advice provided by Douglas in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and/or testing locations. The advice may also be limited by site accessibility.

The assessment of atypical safety hazards arising from this advice is restricted to the geotechnical components set out in this report and based on known project conditions and stated design advice and assumptions. While some recommendations for safe controls may be provided, a detailed 'safety in design' assessment is outside the current scope of this report and requires additional project data and assessment.

This report must be read in conjunction with all the attached pages and should be kept in its entirety without separation of individual pages or sections. Douglas cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by Douglas. This is because this report has been written as advice and opinion rather than instructions for construction.

Please contact the undersigned if you have any questions on this matter.

Yours faithfully

Douglas Partners Pty Ltd

Huw Smith
Senior Associate

Reviewed by

John Braybrooke
Principal

Attachments: About this Report
Drawing 1: Slope Stability Risk Zone plan with proposed sub-division plan overlay

About this Report

October 2024

Introduction

These notes have been provided to amplify Douglas' report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

Douglas' reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Copyright

Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;
- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, Douglas will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, Douglas cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, Douglas will be pleased to assist with investigations or advice to resolve the matter.

About this Report

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, Douglas requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. Douglas would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

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Legend

- Site and Lot Boundaries
- LiDAR Topographic Contours (1 m elevation interval)

Sub-Division Masterplan Classification

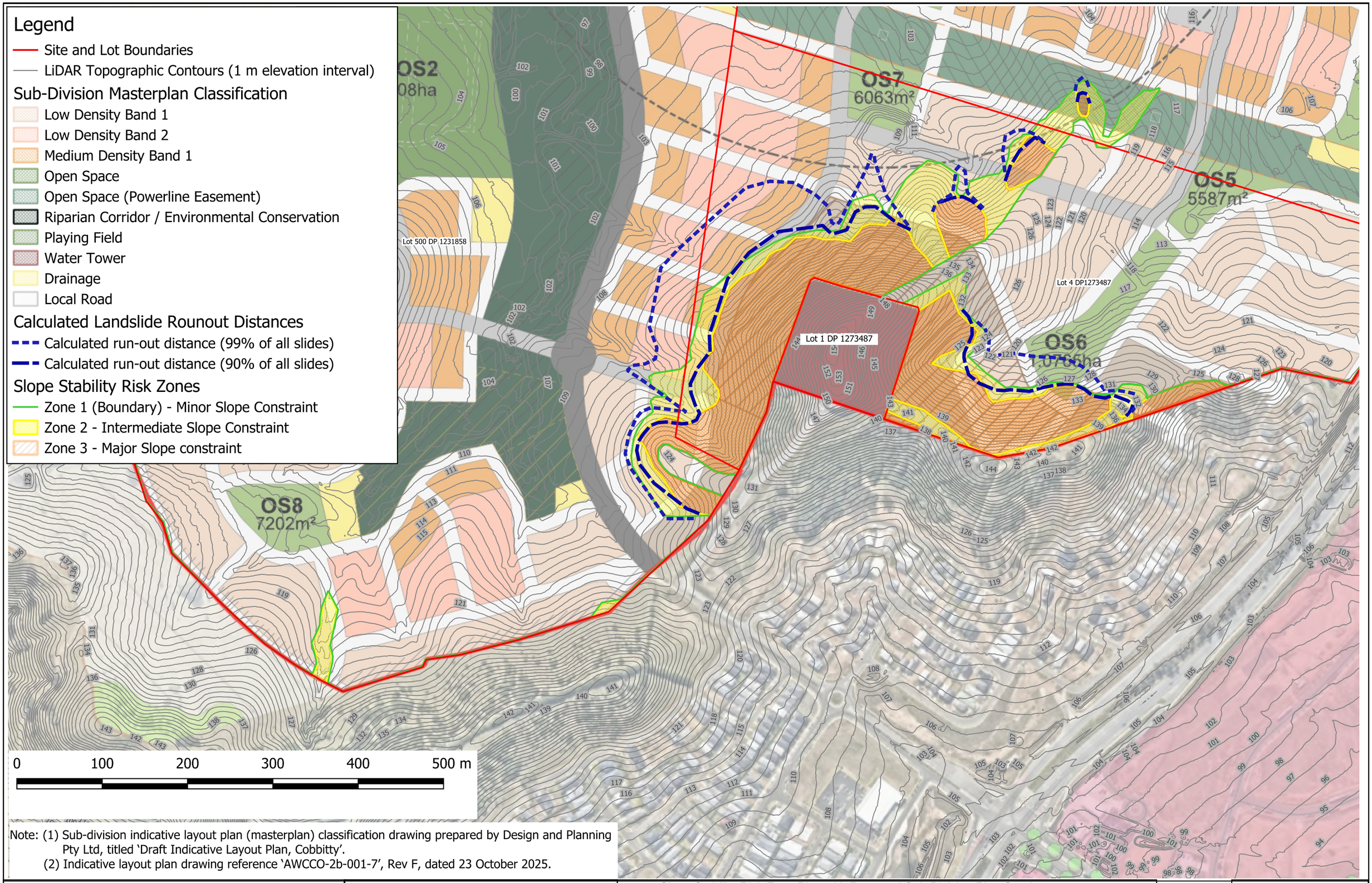
- Low Density Band 1
- Low Density Band 2
- Medium Density Band 1
- Open Space
- Open Space (Powerline Easement)
- Riparian Corridor / Environmental Conservation
- Playing Field
- Water Tower
- Drainage
- Local Road

Calculated Landslide Rounout Distances

- Calculated run-out distance (99% of all slides)
- Calculated run-out distance (90% of all slides)

Slope Stability Risk Zones

- Zone 1 (Boundary) - Minor Slope Constraint
- Zone 2 - Intermediate Slope Constraint
- Zone 3 - Major Slope constraint



Note: (1) Sub-division indicative layout plan (masterplan) classification drawing prepared by Design and Planning Pty Ltd, titled 'Draft Indicative Layout Plan, Cobbitty'.
(2) Indicative layout plan drawing reference 'AWCCO-2b-001-7', Rev F, dated 23 October 2025.

Douglas PARTNERS | GROUNDED EXPERTISE

CLIENT: JJ Cobbitty Development Pty Ltd		
OFFICE: Macarthur	DRAWN BY: HDS	
SCALE: 1:5000 (A3)	DATE: 27/10/2025	

TITLE: Slope Stability Risk Zone Plan with Proposed Sub-Division Plan Overlay
Geotechnical Review
South Creek West, Sub-Precinct 5
670 The Northern Road, Cobbitty NSW

N
MGA

PROJ. #:	92225.10
DRAWING No:	1
REVISION:	4

Douglas PARTNERS | GROUNDED EXPERTISE

JJ Cobbitty Development Pty Ltd
Level 6, 5 Martin Place
Sydney, NSW 2000

Attention: Xudai Sun
Email: xsun@alwaysconsultancy.com.au

Project 92225.14
27 October 2025
R.001.Rev0
HDS

Report on Suitability Assessment
South Creek West, Sub-Precinct 5
621 The Northern Road & 657 The Northern Road, Cobbitty NSW

1. Introduction

This report presents a suitability assessment (opinion) prepared by Douglas Partners Pty Ltd (Douglas), on the advice set out in four previous Douglas reports relating to 621 The Northern Road and 657 The Northern Road, Cobbitty NSW. The assessment was commissioned in an email dated 29 September 2025 by Mr. Xudai Sun of Always Consultancy Pty Ltd on behalf of JJ Cobbitty Development Pty Ltd, and was undertaken in accordance with Douglas' proposal 92225.14.P.001.Rev0 dated 18 July 2025.

The scope of work included a review of four previous Douglas reports, and preparation of an opinion (this report) as to whether the advice on various geotechnical, salinity and contamination matters presented in those reports is still relevant and suitable for the proposed development.

2. Proposed development

The proposed development for the site is shown on the supplied Indicative Layout Plan (ILP) for the development (prepared by Design and Planning Pty Ltd), which is titled 'Draft Indicative Layout Plan, Cobbitty', drawing reference 'AWCCO-2b-001-7', Rev F, dated 23 October 2025. The ILP drawing is attached to this report.

The ILP indicates that 101.26 hectares of land within the site is to be developed to create 2,650 lots for residential dwellings (including low and medium density), with the remainder of the site to be used for 'mixed use' areas, environmental conservation, open space and public recreation areas (i.e. parks and playing fields), and for infrastructure (e.g. above-ground electricity transmission lines).

It is noted that the proposed development area boundary has remained relatively unchanged over the period since the reports were completed by Douglas for this development (inclusive of earlier report revisions).

3. Previous Douglas reports

The previous Douglas reports prepared for the proposed development area, which are assessed in this report are:

- *'Report on Preliminary Geotechnical and Salinity Assessment, Proposed Rezoning, Sub Precinct 5, South Creek West, NSW,* Report 92225.02.R.001.Rev3', dated 8 December 2022 (Douglas, 2022a);
- *'Report on Preliminary Site Investigation (Contamination), Proposed Rezoning, Sub Precinct 5, South Creek West, NSW,* Report 92225.04.R.001.Rev4', dated 21 December 2022 (Douglas, 2022b);
- *'Report on Preliminary Groundwater Investigation, Proposed Rezoning, 621 - 705 The Northern Road, Cobbitty, NSW,* Report 92225.04.R.002.Rev4, dated 22 December 2022 (Douglas, 2022c); and
- *'Report on Salinity Investigation and Salinity Management Plan, Proposed Rezoning, Sub Precinct 5, South Creek West, NSW, Report 92225.05.R.001.Rev0',* dated 13 March 2023 (Douglas, 2023).

4. Assessment of reports

4.1 Preliminary geotechnical and salinity assessment

The preliminary geotechnical and salinity assessment report (Douglas, 2022a) was prepared at an early stage of the project, when access for site investigations and site walkover was limited to the eastern half of the proposed development area.

The advice in the report includes:

- Preliminary broad scale mapping of potential constraints to development (i.e. 'Zone 1' Minor Constraints, to 'Zone 3' Major Constraints);
- Preliminary assessment of soil erosion hazards, based on laboratory testing of soil samples from widely spaced test pits;
- Preliminary assessment of soil salinity and soil aggressivity to buried concrete and steel, based on laboratory testing of soil samples from test pits;
- Site preparation and earthworks, regarding stripping of topsoil, depth to the top of rock, and preparation of portions of the site for structures and pavements; and
- Advice on further investigations likely to be required at later stages of the project.

Following preparation of the report, supplementary investigations have been carried out for the broader development area, including for the steeper parts of the site along and adjacent to ridgelines (e.g. Douglas report 92225.11.R.001.Rev1, dated 20 December 2024: "Douglas, 2024"), and also for the relatively flatter parts of the site (e.g. Douglas, 2023).

The potential constraints to development in Douglas (2022a) have been further defined in Douglas (2024) as 'landslide risk hazard zones'. Additional testing has also been carried out for erosion and dispersion potential of various soil horizons, including for residual and colluvial soils. Soil salinity and soil aggressivity is assessed in further detail in Douglas (2023).

The preliminary site preparation and earthworks advice in Douglas (2022a) covers the following issues:

- potential development constraints;
- soil erosion hazards;
- soil salinity;
- soil aggressivity to buried concrete and steel; and
- site preparations and earthworks.

It is our opinion that the advice in the Douglas (2022a) report is generally consistent with advice on this subject presented in later reports (e.g. Douglas, 2024) and therefore still relevant, however, those later reports provide more detailed and specific advice on the above points and other matters. On this basis, although the advice provided in Douglas (2023) and Douglas (2024) supersedes the advice in the preliminary report (i.e. Douglas, 2022a), the test pit logs and location plan are still relevant.

4.2 Preliminary site investigation (contamination)

The preliminary site investigation (contamination) report (Douglas, 2022b: 'the PSI report') was also prepared at an early stage of the project and was progressively revised to reflect changes to the ILP.

The advice in the report includes:

- A tabulated summary of identified potential areas of environmental concern (PAEC);
- An assessment of potential risks of harm to human or environmental receptors, together with risk management actions based on potential sources of contamination (and associated contaminations of potential concern);
- Recommendations for investigation of soil and groundwater at the site, to assess the presence, degree and extent of contamination, and any remediation requirements associated with the potential contamination sources identified;
- Recommendations to carry out a hazardous building materials survey, to identify hazardous building materials within the site boundaries, prior to any demolition or maintenance; and
- Opinion that
    - PAECs encountered during preparation of the PSI report were considered to be typical for a rural residential site with agricultural activity,
    - it is considered unlikely that the identified PAECs will present a major constraint to development/rezoning, and
    - the site can be rendered suitable for any beneficial land use scenarios, subject to further investigation and remediation as required.

It is understood that some areas of the site have been further developed since preparation of the PSI, including construction of two water reservoirs at the southern limit of 'PAEC 5', and construction of a service station and 'fast food' restaurant in 'PAEC 8'. To Douglas' knowledge, a detailed site investigation for contamination or hazardous building materials survey has not yet been carried out.

It is our opinion that the advice and recommendations in the PSI report are still relevant, and that the conclusions are unchanged.

4.3 Preliminary groundwater investigation

The preliminary groundwater investigation report (Douglas, 2022c: 'the groundwater report') was also prepared at an early stage of the project and was progressively revised to reflect changes to the ILP.

The advice in the report includes:

- A tabulated summary of groundwater analysis results from groundwater samples obtained from wells installed at the site, with comparison of the results to both the 'Australian Drinking Water Guidelines' (NHMRC, NRMMC, 2018) and the Australian and New Zealand Guidelines (ANZG, 2018) default guidelines for freshwater quality (95% level of protection of species). Shaded values in the table in the groundwater report indicate concentrations for some heavy metals which are above the guideline values;
- Interpretation that the concentrations of heavy metals (i.e. cadmium, copper, nickel and zinc) were within the drinking water guidelines, and that the groundwater is 'saline';
- Opinion that
    - hydraulic conductivity of the surrounding soils and rock is 'low', with dry conditions mostly encountered during drilling whereas groundwater was subsequently measured in all groundwater wells,
    - the measured concentrations of heavy metals are indicative of natural background conditions, and are therefore not considered to prevent any potential development proposals for the site,
    - groundwater dependent ecosystems to the north and south of the site are not likely to be impacted by development of the site, and
    - further groundwater investigation is not considered to be required as part of a rezoning application.

Following preparation of Douglas (2022d), supplementary investigations into the changes of groundwater levels over time have been subsequently carried out for specific areas of the site, on the flanks of the ridgeline near the southern site boundary (i.e. near to site with the water reservoirs: in Douglas (2024)).

To Douglas' knowledge, no alterations have been carried out within the site boundary to the hydrological regime, such as alterations to creek lines or installation of additional stormwater reticulation. It is therefore considered unlikely that there will have been changes to the background concentration of heavy metals in the groundwater, alterations to the hydraulic conductivity of the soil and rock, or salinity of the groundwater.

It is our opinion that the advice and recommendations in the groundwater report are still relevant, and that the conclusions are unchanged.

4.4 Salinity investigation and salinity management plan

The salinity investigation and salinity management plan report (Douglas, 2023: 'the salinity report') was prepared to cover the current footprint of the development ILP. As the previous preliminary salinity investigation (Douglas, 2022a) was limited to the eastern half of the proposed development area, the work scope for this investigation was expanded to include site investigations and a walkover in the western half of the site (i.e. Lot 500 in DP 1231858).

The advice in the report includes:

- Tabulated salinity, aggressivity, sodicity and dispersibility analysis results from soil samples within test pits across the broader site, together with plans depicting the broad variations in soil salinity and aggressivity across the site. The data and plans indicate:
  - soil aggressivity to buried concrete (with reference to Australian Standard AS2159) in the range 'non-aggressive' to 'mildly aggressive',
  - soil aggressivity to buried steel (with reference to AS2159) in the range 'non-aggressive' to 'moderately aggressive',
  - sodicity class (Department of Land and Water Conservation, 2002) in the range 'non-sodic' to 'highly sodic', and
  - salinity class (after Richards, 1954) in the range 'non-saline' to 'highly saline'.
- Interpretation that the soil aggressivity, salinity and sodicity test result ranges are naturally occurring features of the local landscape, and that they are not considered to be significant impediments to the proposed development provided appropriate management techniques are implemented;
- A salinity management plan with salinity management strategies to be implemented during bulk earthworks;
- A management plan during completion of service installation (e.g. construction of roads, drainage and during excavation of trenches for buried services), with recommended durability requirements for concrete foundations and structures and concrete piles, and corrosion allowances for steel (in millimetres per year);
- Opinion that
  - further salinity investigations will be required prior to subdivision certification (after completion of bulk earthworks) to provide more detailed recommendations for individual lots, and
  - additional investigations in areas to be cut deeper than 3 m below the current ground surface level are not considered to be necessary, on the basis that there are already a range of salinity and aggressivity classifications at the site, and that a final salinity investigation will appropriately classify the site after bulk earthworks.
- To Douglas' knowledge, no alterations have been carried out within the site boundary to the hydrological regime, such as alterations to creek lines or installation of additional stormwater reticulation, which would alter the classifications presented in the report; and
- It is our opinion that the advice and recommendations in the salinity report are still relevant, and that the conclusions are unchanged.

5. Conclusions

As outlined in Section 4.1, it is concluded that the advice in the Douglas preliminary geotechnical and salinity assessment report (Douglas, 2022a) is generally consistent with advice in later reports and therefore still relevant, although later reports (i.e. Douglas (2023) and Douglas (2024)) provide more detailed and specific geotechnical advice. It is noted though that the test pit logs and location plan in Douglas (2022a) have not been repeated in subsequent reports and are therefore relevant. As outlined in Sections 4.2 to 4.4, it is concluded that the advice, recommendations and conclusions in the PSI report (Douglas, 2022b), the groundwater report (Douglas, 2022c), and the salinity report (Douglas, 2023) are unchanged.

6. References

ANZG. (2018). *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*. Canberra, ACT: Australian and New Zealand Governments and Australian state and territory governments.

Department of Land and Water Conservation. (2002). *Site Investigations for Urban Salinity*. Sydney: Accessed from https://www.environment.nsw.gov.au on 28 July 2025.

Douglas. (2022). *Preliminary Groundwater Investigation, Proposed Rezoning, 621-705 The Northern Road, Cobbitty, NSW*. Macarthur: Douglas Partners Pty Ltd, Report 92225.04.R.002.Rev4, dated 22 December 2022.

Douglas. (2022). *Report on Preliminary Geotechnical and Salinity Assessment, Proposed Rezoning, Sub Precinct 5, South Creek West, NSW*. Macarthur: Douglas Partners Pty Ltd, Report 92225.02.R.001.Rev3, dated 8 December 2022.

Douglas. (2022). *Report on Preliminary Site Investigation (Contamination), Proposed Rezoning, Sub Precinct 5, South Creek West, NSW*. Macarthur: Douglas Partners Pty Ltd, Report reference 92225.04.R.001.Rev4, dated 21 December 2022.

Douglas. (2023). *Report on Salinity Investigation and Salinity Management Plan, Proposed Rezoning, Sub Precinct 5, South Creek West, NSW*. Macarthur: Douglas Partners Pty Ltd, Report 92225.05.R.001.Rev0, dated 13 March 2023.

Douglas. (2024). *Report on Detailed Geotechnical Investigation, 641 and 657 The Northern Road, Cobbitty NSW*. Macarthur: Douglas Partners Pty Ltd, Report reference 92225.11.R.001.Rev1, dated 20 December 2024.

NHMRC, NRMMC. (2018). *Australian Drinking Water Guidelines 6, 2011*. Canberra; Version 3.5, Updated 2018: National Health and Medical Research Council, National Resource Management Ministerial Council.

Richards, L. A. (1954). *Diagnosis of Saline and Alkaline Soils*. Washington D.C: US Department of Agriculture.

7. Limitations

Douglas Partners Pty Ltd (Douglas) has prepared this report for this project at 621 The Northern Road & 657 The Northern Road, Cobbitty NSW in line with Douglas' proposal 92225.14.P.001.Rev0 dated 18 July 2025 and acceptance received from Mr. Xudai Sun of Always Consultancy Pty Ltd on behalf of JJ Cobbitty Development Pty Ltd dated 29 September 2025. The work was carried out under Douglas' Engagement Terms. This report is provided for the exclusive use of JJ Cobbitty Development Pty Ltd for this project only and for the purposes as described in the report. It should not be used by or be relied upon for other projects or purposes on the same or another site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of Douglas, does so entirely at its own risk and without recourse to Douglas for any loss or damage. In preparing this report Douglas has necessarily relied upon information provided by the client and/or their agents.

The opinion provided in the report is based on previous sampling and testing, and then only to the depths investigated and at the time the work was carried out. Sub-surface conditions can change abruptly due to variable geological processes and also because of human influences. Such changes may occur after Douglas' field testing has been completed.

Douglas' opinion is based upon the conditions encountered during the previous investigations, and the advice prepared following site investigations and testing. The opinion provided by Douglas in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and/or testing locations.

The assessment of atypical safety hazards arising from this advice is restricted to the geotechnical, environmental and groundwater components set out in this report, which are sourced from previous reports. Those reports should be referenced for further details. Detailed 'safety in design' assessment is outside the current scope of this report and requires additional project data and assessment.

This report must be read in conjunction with all the attached pages and should be kept in its entirety without separation of individual pages or sections. Douglas cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by Douglas. This is because this report has been written as advice and opinion rather than instructions for construction.

Please contact the undersigned if you have any questions on this matter.

Yours faithfully
Douglas Partners Pty Ltd

Huw Smith
Senior Associate

Reviewed by

John Braybrooke
Principal

Attachments: About this Report
Supplied Indicative Layout Plan (ILP)

About this Report

October 2024

Introduction

These notes have been provided to amplify Douglas' report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

Douglas' reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Copyright

Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;
- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, Douglas will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, Douglas cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, Douglas will be pleased to assist with investigations or advice to resolve the matter.

About this Report

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, Douglas requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. Douglas would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

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LEGEND

- Subject Site
- 330kV Powerline Easement (Indicative)

Land Use

- Environmental Living (Maximum 10dw/ha)
- Low Density Band 1 (10 to 20 dw/ha)
- Low Density Band 2 (20 to 25 dw/ha)
- Medium Density Band 1 (25 to 35 dw/ha)
- Open Space
- Open Space (Powerline Easement)
- Playing Field
- Drainage
- Water Body
- Online Dry Basin
- Existing House to be Retained
- Interface with Neighbouring Land to be Coordinated
- Riparian Corridor
- Environmental Conservation
- School (Education Investigation Area)
- Service Station
- Water Tower
- Road - Sub-arterial (4 lanes)
- Road - Sub-arterial (2 lanes)
- Road - Collector
- Road - Local
- Potential Future Road Connection
- Hilltop Investigation Area

P.10 MD1.7 SF.3 P.11 NC.2 LD1.5 EL.3 LD1.8 MD1.13 P.20 LD2.5 P.21 LD2.6 MD1.14

500m Catchment

AOS1 5.19ha

School 3.00ha

OS1 6870m²

OS2 1.0577ha

OS3 2.03ha (excludes 0.9804Ha waterbody)

OS4 9718m²

OS5 5587m²

OS6 1.0765ha

OS7 6063m²

OS8 7202m²

OS9 9145m²

AOS2 5.08ha

Other Areas	Area (Ha)
Riparian	17.018
Electrical Easement	5.29
Waterbody	0.98
Detention Basin	6.76
OS Provided	18.90
Total (Ha)	48.95
Total Ha/1,000 population	6.12

Open Space Requirements	Total Precinct	
Yield (Dwellings)	2,650	
Population	8,049	
OS Ha @ 15 % of NDA (GANSW Presentation, Dated 6/8/2025)	18.90ha	
OS required (Ha)	**18.90**	
OS provided (Ha)	**18.90**	%
Active	10.27	54.3%
Passive	8.629	45.7%
OS difference (Ha)	**0.00**	

Yield Scenario

Environmental Living		Low Density Band 1		Low Density Band 2		Medium Density Band 1		Total		Site Average (dw/ha)
NDA (ha)	No. of Lots (10dw/ha)	NDA (ha)	No. of Lots (20dw/ha)	NDA (ha)	No. of Lots (25dw/ha)	NDA (ha)	No. of Lots (32dw/ha)	NDA (ha)	No. of Lots	
5.65	**56**	**29.33**	**586**	**17.27**	**431**	**49.01**	**1,577**	**101.26**	**2,650**	**26**

Draft Indicative Layout Plan
COBBITTY

NORTH

50 0 100 200 300 400 500 metres

Ref: AWCCO-2-001-7 **Date:** 23/10/2025 **Revision:** F **Scale:** 1:5,000@A1

Note: All areas and dimensions subject to detailed survey

Suite 304 / 171 Clarence St
SYDNEY NSW 2000
PO Box 1778
SYDNEY NSW 2001
(02) 9290 3636
admin@designandplanning.com.au
www.designandplanning.com.au
Design+ Planning