

PLANNING PROPOSAL

THE HUB

MOUNTAIN ASH ROAD, GOULBURN

ENGINEERING SERVICES REPORT

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Attachment A – Subdivision Layout - Windellama

Attachment B - Preliminary Soils Assessment, Site and Soil Evaluation

Attachment C - NorBE Assessment Wastewater Effluent Model Summaries

1. Roads and Lot layout

1.1. Preamble

The following comments relate to the plan received and referenced SUBDIVISION LAYOUT – WINDELLAMA CD-01-A by Stuart Design and Job No. 22-012.

1.2. Site Features

1.3. Road Layout

The proposed road reserve widths are 20m in accordance with Council's Standards for Engineering Works Design Specification 2013. The new roads will incorporate table drains in accordance with Council's standard drawing SD-R 01 and include mitre drains at regular intervals. It is expected that the any intersections with an existing road will incorporate BAR/BAL treatment.

Precinct 1 has an intersection with Rosemont Road and one intersection with Barretts Lane. Precinct 2 has the single access with Mountain Ash Road whilst Precinct 3 has just the two intersections with Mountain Ash Road. This reflects the current number of driveway accesses to the existing lots. All of the proposed intersections have suitable separation from any other intersection whether it be existing or proposed.

The locations of the intersections enable suitable sight distance requirements in accordance with the Austroads guidelines.

1.4. Earthworks

The proposal does not include any regrading of the site and hence the required earthworks will be restricted to that required for the roads. As the topography is characterized by gently to moderately sloped hillsides, then there will not be any significant cut and fill required. There may be some works relating to stabilizing the existing 3rd order watercourses but this will largely be limited to battering back of embankments which again will only require minimal earthworks and would not require any removal of spoil from the site nor require any additional fill material to be brought onsite.

1.5. Lot Layout

The plans show a potential yield of 108 lots. The minimum lot size is 20 Ha. The area of some of the lots increases to allow for encroachments by watercourse setbacks and the 100yr ARI flood extents to ensure there is sufficient area for a dwelling and Effluent management Area (EMA).

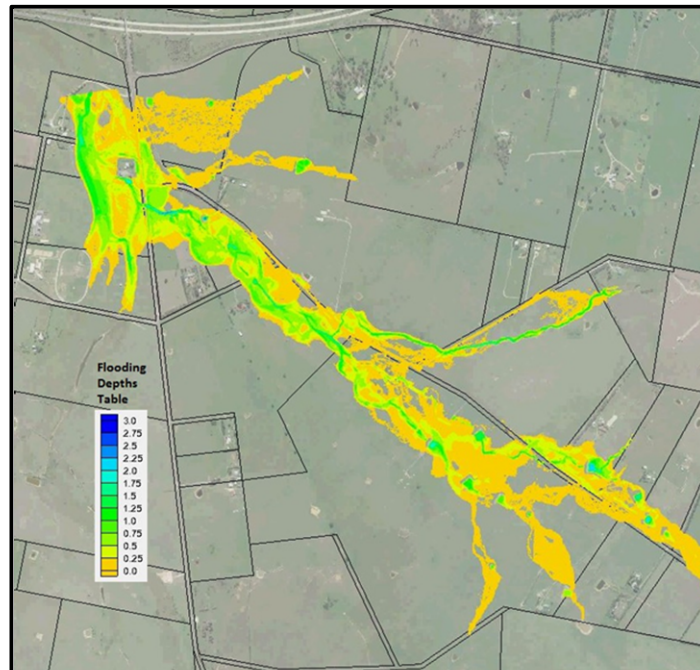
The two existing dwellings have been located within future allotments (Lots 33 & 64) with allowances for the required minimum setbacks to the new boundaries. The existing effluent treatment systems will be augmented and relocated as necessary to be retained within the existing lot boundaries.

2. Flooding

The extent of the flooding shown on the plans was determined using Hydrological Modeling undertaken using WBNM ('Watershed Bounded Network Model' Boyd et al, 2007) which enables simulation of complex catchment behavior. TUFLOW was then used to model the hydrodynamic behavior in the watercourses and floodplains for the 100yr ARI applying a 120min critical duration.

An analysis was also undertaken of Gundry Creek applying a 720min critical duration. Gundry Creek is a large rural catchment the main channel of which is to the west of Windellama Road. The analysis determined that the rising waters from the Gundry Creek system have little impact on the site.

Below is an extract from the modelling showing the extent and depth of the 100yr ARI inundation. A significant extent of the area subject to flooding during the 100yr ARI is between 0 and 250mm.



A sensitivity analysis was also undertaken for the 50yr ARI which determined that the extent of inundation was largely similar to that determined for the 100yr ARI. The attached plans include the 100yr ARI flooding extents. The plans also show the centerlines of the drainage paths and setbacks of either 40m or, where the drainage path has caused an incision into the ground surfaces, 100m.

The analysis determined that the rising waters from the Gundry Creek system have little impact on the Planning Proposal site nor the potential future layout.

3. State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011

The subject site is located within the Sydney Drinking Water Catchment Area. Therefore, concurrence will be required from Water NSW for any proposed development of the site relating to achieving a Neutral or Beneficial Effect (NorBE) in regards to stormwater runoff quality and effluent management.

Discussions were held with the local Water NSW officer regarding the site. The site assessment to achieve NorBE incorporated the application of the department's guidelines particularly the *Water Sensitive Design Guide for Rural Residential Subdivisions 2021*. The assessment included site inspections to classify the existing watercourses. Furthermore, there were no indications from the inspections of any areas of any salinity and/or possible contamination and there was only the one localized area of rock outcrops.

The result of the assessment is that the development site would be able to support onsite effluent management areas.

3.1. Treatment of Stormwater Runoff

As discussed above, the proposed roads will incorporate table drains which will assist in treating the runoff from the roads. To offset any increase in pollutants in the runoff from the site, it is proposed that tree planting is undertaken along the main watercourses. The widths of planting would be in the order of 10-15m wide and will be fenced.

3.2. Effluent Management

For each lot, an area of up to approximately 2,000m² for an Effluent Management Area (EMA) has been considered in the determination of the proposed lot sizes & layout. A process in accordance with the Water NSW's guidelines 'Water Sensitive Design Guide for Rural Residential Subdivisions' was applied to support this area for an EMA to each lot.

A Site & Soil Evaluation was undertaken by ACT Geotechnical Engineers P/L which included 31 test holes across the proposed development site. The report is included in Attachment 'B'.

The data from the report was then entered into the WaterNSW's NorBE assessment tool for a number of test locations applying:

- Four bedrooms excluding a spa bath
- Rainwater water supply
- Standard Aerated Wastewater Treatment System (AWTS)
- Sub-surface irrigation for disposal
- Ground water generally >1m deep as none test holes encountered any ground water
- The calculated permeability applied where suitable
- Slope gradients were obtained from the terrain model

The AWTS system was trialed as this would be the most likely cost-effective methodology of wastewater treatment but other treatment systems would also be suitable. A spa bath was included for one of the locations and the required area of treatment was less than 2,000m². The results of the test holes entered into the assessment tool would be indicative of the whole of the site and supported the area of 2,000m² for the EMA's. The proposed lot layout will require some additional refinement during the preparation of a Development Application including identifying the location of table drains to the proposed roads.

[Attachment 'C'](#) contains the NorBE assessment summaries with the test hole reference number shown on the top left corner.

4. Contamination

Currently a large area of the site is being used for agriculture which may require the use of fertilisers and possibly pesticides. The planning proposal has the potential to reduce the amount of contaminants that would currently be washed into the existing depressions and watercourses. The Site & Soil Evaluation undertaken by ACT Geotechnical Engineers P/L also included test results for the presence of organochlorine pesticides (OCP) and organophosphorus pesticides (OPP) in three locations. The results of these tests were assessed against the National Environmental Protection Measure (NEPM) and were significantly below the required health-based investigation levels for residential development.

Given the results of soils testing, the proposal is considered to be in accordance with the requirements of *SEPP55 – Remediation of Land* and as the results presented are significantly below health requirements, remediation is unlikely to be required.

The site is therefore considered to be low in risk with regard to contamination and is unlikely to present any concerns for future residents.

5. Utility Services

5.1. Water Supply

The nearest Council watermain is located on the other side of the freeway approximately 1km away from the intersection of Rosemont Road and Windellama Road. It is understood that the pipe size is 100mm which is expected to have insufficient capacity to service the site.

It is therefore expected that future dwellings will be required to have not less than 46,000 litres of roof water storage for domestic purposes in accordance with the DCP.

5.2. Electrical

There is an overhead electrical service along Mountain Ash Drive from which it is expected that electrical power can be expanded through the proposed road layout to service the new lots.

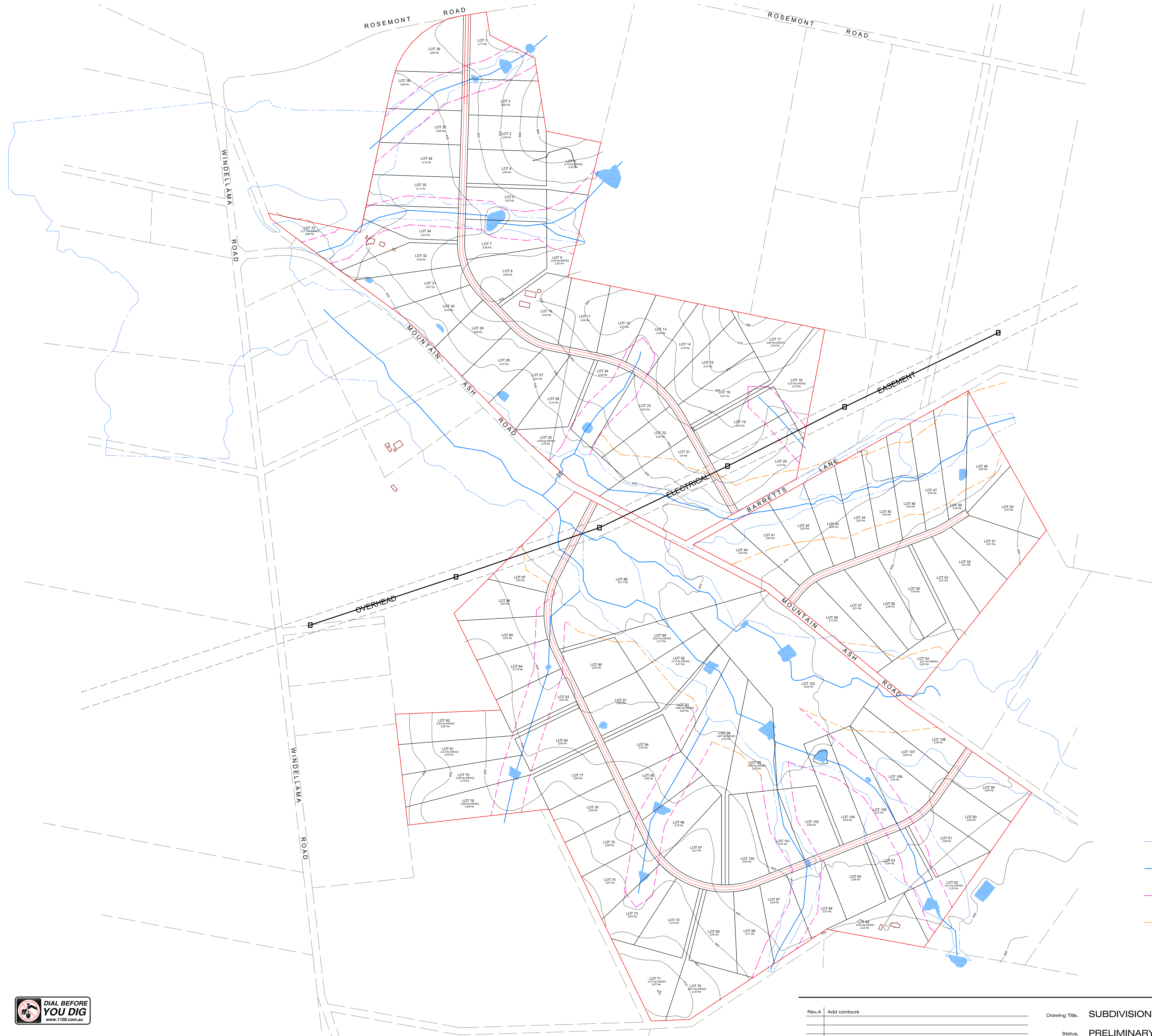
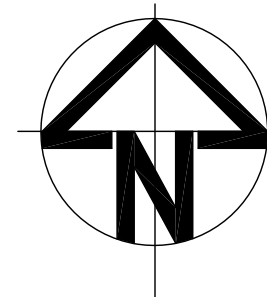
5.3. Telecommunications

There are existing telecommunication services within Mountain Ash Road, Rosemont Road and Barretts Lane. Telecommunication services to the lots can be reticulated from these existing services.

5.4. Sewer

Connection of the site to an existing sewerage system is unavailable and therefore wastewater will be required to be treated and disposed of onsite.

ATTACHMENT A
Layout Plan



— 100 Year ARI
 — WATERCOURSE / DAM
 - - - WATERCOURSE 40m SETBACK
 - - - WATERCOURSE 100m SETBACK

Rev.A	Add contours
Rev.	Description.

Drawing Title. SUBDIVISION LAYOUT - WINDELLAMA

Status. PRELIMINARY

Plot Date.
Scale. 1:5000 @ A1
Sheet No. 1
Job No. 22-012
Drawing No. CD-01-A

ATTACHMENT B
ACT Geotechnical Engineers Pty
Ltd Report on Effluent Disposal
Preliminary Soils Assessment

5 July 2021

Our ref: KA/C11822

Southern Region Land Engineering

Via email: gregtodd.srle@gmail.com

Attention: Greg Todd

**BRISBANE GROVE RURAL SUBDIVISION
ROSEMONT ROAD & MOUNTAIN ASH ROAD, GOULBURN, NSW
EFFLUENT DISPOSAL – SITE AND SOIL EVALUATION
PRELIMINARY SOILS ASSESSMENT**

1 Introduction

At the request of Southern Region Land Engineering, ACT Geotechnical Engineers Pty. Ltd carried out an effluent disposal assessment to AS1547 "On-Site domestic wastewater management", for the proposed Brisbane Grove Rural Subdivision along Rosemont Road and Mountain Ash Road, in Goulburn, NSW.

The project comprises a new residential subdivision, and the client would like to maximize the yield by having minimum lot sizes of 20,000m² (2ha). To allow this yield, it must be proved that the land can absorb the wastewater within the desired lot size.

This Site and Soil Evaluation was conducted in general accordance with AS 1547:2012 - "On-site domestic wastewater management", "Designing and Installing On-Site Wastewater Systems: A WaterNSW Current Recommended Practice: 2019", and "The Environment & Protection Guidelines 1998 – On-Site Sewage Management for Single Households" (Silver Book).

The site details and assumptions made to assess the requirements of the effluent disposal system are outlined in Table 1 below.

The details of the site and proposed works are summarized in Table 1 below.

TABLE 1 – SITE DETAILS

Area of Lots	Minimum. 2ha
Rainfall Station	070330 – Goulburn Airport AWS NSW
Evaporation Station	070263 – Goulburn TAFE

2 Effluent Disposal Site and Soil Assessment

The proposed locations were assessed and the site limitations are addressed below.

The 1:100,000 Goulburn Geology Map documents the area to be covered by Quaternary Age residual and colluvial deposits underlain by Siluro-Devonian aged Mount Fairy Group and Bindook Group bedrock comprising Back Station Ignimbrite, Saltpetre Andesite, and Bullamalita Conglomerate.

2.1 Site Limitation Assessment

Table 2 below is a site assessment of the proposed lot locations, and have been assessed using Table 1 from "On-site Sewage Management for Single Households". The table used for this assessment is attached to this report.

TABLE 2 – SITE ASSESSMENT

Borehole / Location	Slope/ Direction	Exposure to sun/wind	Landform / Slope	Erosion Potential	Presence of Fill	Rock Outcrops (%)	Groundwater
A01	<10% / E	High	Linear Planar	Low/Not evident	Not found	<10%	Not encountered
A02	<10% / N	High	Waxing Divergent	Low/Not evident	Not found	<10%	Not encountered
A03	10-20% / N	High	Linear Planar	Low/Not evident	Not found	<10%	Not encountered
A04	10-20% / S	High	Linear Planar	Low/Not evident	Not found	<10%	Not encountered
A05	<10% / S	High	Linear Planar	Low/Not evident	Not found	<10%	Not encountered
A06	<10% / S	High	Linear/Waning Planar	Low/Not evident	Not found	<10%	Not encountered
A07	<10% / S	High	Waxing Divergent	Low/Not evident	Not found	<10%	Not encountered
A08	<10% / S	High	Waxing Divergent	Low/Not evident	Not found	<10%	Not encountered
A09	<10% / S	High	Linear Planar	Low/Not evident	Not found	<10%	Not encountered
A10	<10% / S	High	Linear Planar	Low/Not evident	Not found	<10%	Not encountered
B01	10-20% / S	High	Linear Planar	Low/Not evident	Not found	<10%	Not encountered
B02	<10% / W & SW	High	Linear Planar	Low/Not evident	Not found	<10%	Not encountered
B03	<10% / W	High	Linear Planar	Low/Not evident	Not found	<10%	Not encountered
B04	<10% / W	High	Linear Planar	Low/Not evident	Not found	<10%	Not encountered
C01	<10% / S	High	Linear Planar	Low/Not evident	Not found	<10%	Not encountered
C02	<10% / W	High	Linear Planar	Low/Not evident	Not found	<10%	Not encountered
C03	<10% / W	High	Linear Planar	Low/Not evident	Not found	<10%	Not encountered
C04	<10% / E	High	Linear Planar	Low/Not evident	Not found	<10%	Not encountered
D01	<10% / N & W	High	Linear Planar	Low/Not evident	Not found	<10%	Not encountered
D02	<10%	High	Linear Planar – some ponding encountered	Low/Not evident	Not found	<10%	Not encountered
D03	<10% / N	High	Linear Planar	Low/Not evident	Not found	<10%	Not encountered
D04	<10% / N	High	Linear Planar	Low/Not evident	Not found	<10%	Not encountered

Borehole / Location	Slope/ Direction	Exposure to sun/wind	Landform / Slope	Erosion Potential	Presence of Fill	Rock Outcrops (%)	Groundwater
D05	<10% / N	High	Waxing Divergent	Low/Not evident	Not found	<10%	Not encountered
D07	<10% / SW	High	Linear Planar	Low/Not evident	Not found	<10%	Not encountered
D08	10-20% / S	High	Linear Planar	Low/Not evident	Not found	<10%	Not encountered
D09	<10% / N	High	Linear Planar	Low/Not evident	Not found	<10%	Not encountered
D10	10-20% / S	High	Linear Planar	Low/Not evident	Not found	<10%	Not encountered
D11	10-20% / S	High	Linear Planar	Low/Not evident	Not found	<10%	Not encountered
E01	<10%	High	Linear Planar	Low/Not evident	Not found	<10%	Not encountered
E02	<10%	High	Linear Planar	Low/Not evident	Not found	<10%	Not encountered
E03	<10% / W	High	Linear Planar	Low/Not evident	Not found	<10%	Not encountered

2.2 Sub-surface Conditions

To establish the subsurface conditions, thirty-one (31) test holes were drilled at client-provided locations around the proposed subdivision. Figure 1 shows the site locality, while Figures 2 and 3 are aerial photographs showing the location of the investigation boreholes. The subsurface profiles were logged in terms of the Unified Soil Classification System (USCS). The borehole logs can be found in Appendix B.

2.2.1 Site Soil Properties

Based on the soil encountered and in accordance with AS1547:2012 – “Disposal Systems for Effluent From Domestic Premises” (Reference 2), the properties of the most limiting material are summarised in Table 3 below.

TABLE 3 – SOIL ASSESSMENT

Borehole / Location	Depth of Borehole (m)	Depth of Topsoil (m)	Depth of Bedrock (m)	Soil Texture	Soil Structure	Approx. Bulk Density (g/cm ³)	Indicative Permeability (m/day)
A01	1.3	0.15	>1.3	Medium to Heavy Clays	Massive/weakly-structured	2.0	<0.06
A02	1.3	0.10	>1.3	Light Clays	Moderately-structured	1.8	0.06 – 0.12
A03	1.4	0.25	>1.4	Light Clays	Moderately-structured	1.8	0.06 – 0.12
A04	1.4	0.30	>1.4	Clay Loams	High/moderate structured	1.6	0.5 – 1.5
A05	1.3	0.30	>1.3	Clay Loams	High/moderate structured	1.6	0.5 – 1.5
A06	1.4	0.20	>1.4	Clay Loams	Weakly-structured	1.6	0.12 – 0.5
A07	1.4	0.25	>1.4	Light Clays	Moderately-structured	1.8	0.06 – 0.12
A08	1.4	0.15	>1.4	Medium to Heavy Clays	Massive/weakly-structured	2.0	<0.06
A09	1.3	0.2	>1.3	Sandy Loams	Weakly-structured	1.6	1.4 – 3.0
A10	1.2	0.2	>1.2	Clay Loams	Weakly-structured	1.6	0.12 – 0.5
B01	1.1	0.2	1.0	Clay Loams	High/moderate structured	1.6	0.5 – 1.5
B02	1.4	0.2	>1.4	Light Clays	Moderately-structured	1.8	0.06 – 0.12
B03	1.2	0.2	>1.2	Clay Loams	High/moderate structured	1.6	0.5 – 1.5
B04	1.4	0.2	>1.4	Clay Loams	High/moderate structured	1.6	0.5 – 1.5
C01	0.9	0.2	0.9	Medium to Heavy Clays	Massive/weakly-structured	2.0	<0.06
C02	1.3	0.15	>1.3	Medium to Heavy Clays	Moderately-structured	2.0	<0.06
C03	1.4	0.2	>1.4	Light Clays	Moderately-structured	1.8	0.06 – 0.12

Borehole / Location	Depth of Borehole (m)	Depth of Topsoil (m)	Depth of Bedrock (m)	Soil Texture	Soil Structure	Approx. Bulk Density (g/cm³)	Indicative Permeability (m/day)
C04	1.3	0.3	>1.3	Clay Loams	Weakly-structured	1.6	0.12 – 0.5
D01	1.3	0.2	>1.3	Loams	Massive/weakly-structured	1.5	0.5 – 1.5
D02	1.3	0.3	>1.3	Sandy Loams	Weakly-structured	1.6	1.4 – 3.0
D03	1.3	0.15	>1.3	Light Clays	Moderately-structured	1.8	0.06 – 0.12
D04	1.3	0.2	>1.3	Light Clays	Moderately-structured	1.8	0.06 – 0.12
D05	1.3	0.2	>1.3	Loams	Massive/weakly-structured	1.5	0.5 – 1.5
D07	1.3	0.2	>1.3	Clay Loams	Weakly-structured	1.6	0.12 – 0.5
D08	1.3	0.2	1.2	Light Clays	Moderately-structured	1.8	0.06 – 0.12
D09	1.3	0.2	>1.3	Clay Loams	High/moderate structured	1.6	0.5 – 1.5
D10	1.4	0.2	>1.4	Medium to Heavy Clays	Massive/weakly-structured	2.0	<0.06
D11	1.4	0.3	>1.4	Light Clays	Moderately-structured	1.8	0.06 – 0.12
E01	1.3	0.3	>1.3	Loams	Massive/weakly-structured	1.5	0.5 – 1.5
E02	1.3	0.2	>1.3	Clay Loams	High/moderate structured	1.6	0.5 – 1.5
E03	1.3	0.15	>1.3	Light Clays	Moderately-structured	1.8	0.06 – 0.12

2.2.2 Permeability Testing

Soil percolation (falling head) tests were conducted on three areas within the proposed subdivision in order to assess the permeability of the soils in the area. The percolation tests were conducted in general accordance with the falling head test method described in AS1547-1994 "Disposal Systems for Effluent From Domestic Premises".

Three (3) ~0.45m-0.5m deep test holes were excavated using a 100mm diameter hand auger at locations which were considered to be representative of typical soil conditions within the site. 100mm diameter PVC pipes were then placed inside of the test holes to ensure the stability of the walls, and a 50mm thick layer of gravel was placed over the bottom of the test hole to prevent scouring of the bottom when water is added. The holes were filled with water and left for an initial saturation of the ground. Once the falling rate of the water has stabilized, depth and time measurements were taken to calculate the permeability of the soil. The calculated permeability values are summarised in Table 4.

TABLE 4 – PERCOLATION TESTING RESULTS

Test Number	Location	Soil Category	Calculated Permeability (m/day)	Indicative Permeability – from AS1547:2012 (m/day)
P1	Near A2	Light Clays – moderately structured	1.309 m/day	0.06 - 0.12
P2	Near C3	Light Clays – moderately structured	1.019 m/day	0.06 - 0.12
P3	Near D4	Light Clays – moderately structured	1.440 m/day	0.06 - 0.12

2.2.3 Laboratory Results

Five (5) representative samples were sent to a NATA accredited environmental testing laboratory for pH, electrical conductivity, Emerson testing, and phosphorus sorption capacity. The results of these tests are summarized in Table 5. The Laboratory Certificates of Analysis are included in Appendix C.

TABLE 5 – LABORATORY TEST RESULTS ON SOIL PROPERTIES

Soil Test	Borehole / Sample Depth				
	A7 (0.1m – 0.4m)	A10 (0.0m – 0.3m)	B2 (0.3m – 0.6m)	D3 (0.15m – 0.4m)	D11 (0.3m-0.5m)
pH	6.5	5.3	5.5	5.8	6.8
Electrical Conductivity (µS/cm)	36	52	34	46	52
Emerson Class No.	5.0	5.0	5.0	5.0	5.0
Phosphorus Sorption Capacity (mg/kg)	510	380	590	940	770

Five (5) samples from client-specified locations were also sent to a NATA accredited environmental testing laboratory to test for the presence of organochlorine pesticides (OCP) and organophosphorus pesticides (OPP). The results of these tests, including assessment against the National Environmental Protection Measure (NEPM) 1999, (as amended 2013) human health guideline values for commercial and industrial land uses, are shown in Table 6.

TABLE 6 – LABORATORY TEST RESULTS ON SOILS FOR PESTICIDES

Contaminant	Borehole / Sample Depth					Required health-based investigation levels (HIL) (mg/kg)	
	A6 (0.0m – 0.2m)	B4 (0.0m – 0.2m)	C2 (0.0m – 0.4m)	D2 (0.0m – 0.2m)	D4 (0.0m – 0.2m)	Residential A ¹	Residential B ²
OCPs (mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<6 ⁽ⁱ⁾	<10 ⁽ⁱ⁾
OPPs (mg/kg)	<0.1	<0.1	<0.1	<0.1	<0.1	<6 ⁽ⁱ⁾	<10 ⁽ⁱ⁾

Notes:

¹ HIL A – Residential with garden/accessible soil (home grown produce)

² HIL B – Residential with minimal opportunities for soil access; includes dwellings with fully and permanently paved yard space such as high-rise buildings and apartments

⁽ⁱ⁾ Lowest OCP/OPP specified guideline value

4 Effluent Disposal Recommendations

The local council should be consulted regarding its on-site sewage management policy and required minimum buffer distances (depending on the proposed effluent disposal system).

A fence should be placed around the effluent disposal areas if there is a risk of children, animals or vehicles coming into the area. Signage, complying with AS1319 shall be placed in at least two places at the boundary of the application area, clearly visible to property uses, with wording such as “Recycled Water – Avoid Contact – DO NOT DRINK”.

The treated effluent is not suitable for vegetable gardens or areas where people can come in contact with the effluent.

The areas should not be used for any purposes that compromise the effectiveness of the system or access for future maintenance purposes.

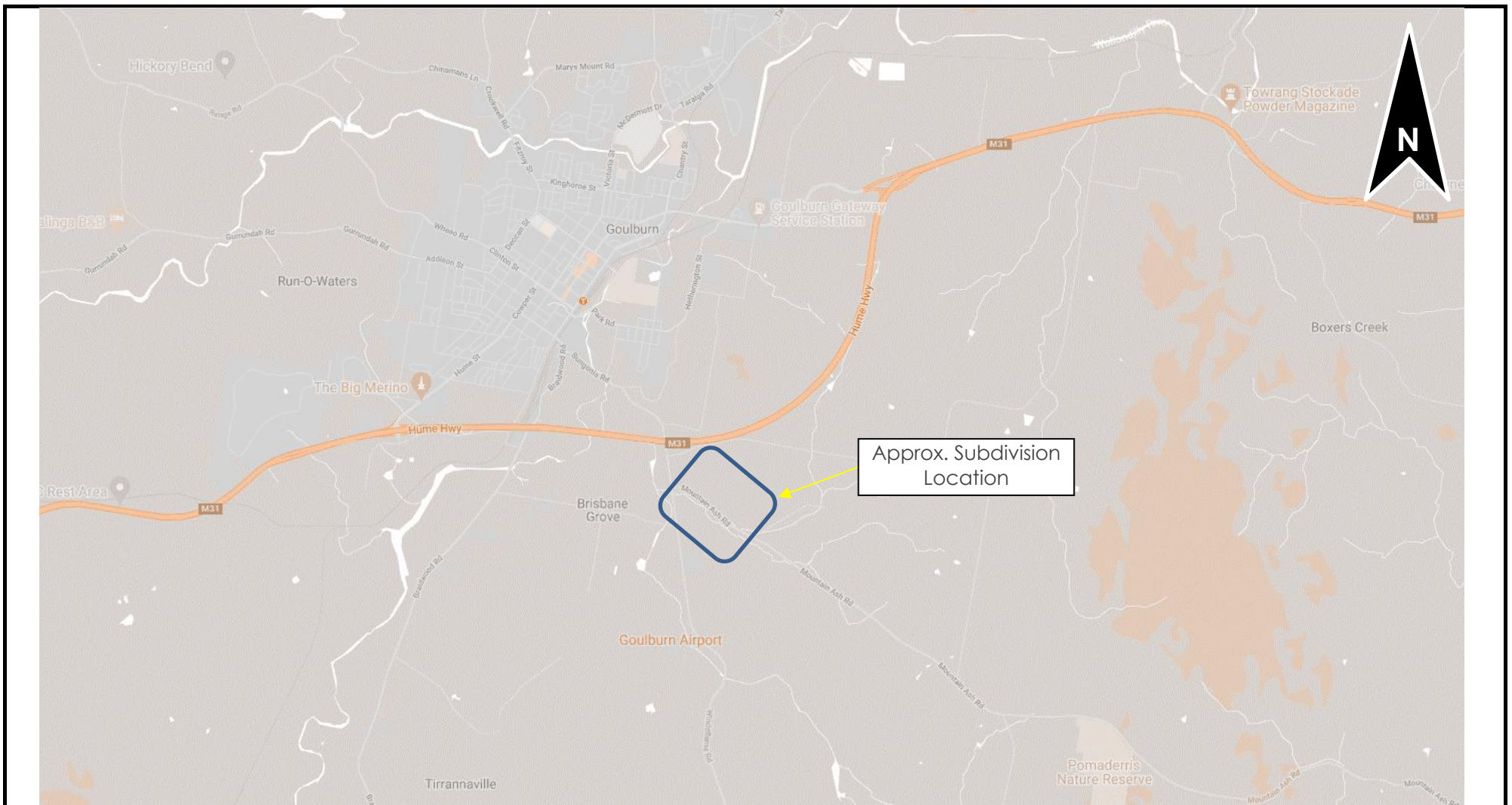
Should you require any further information regarding this report, please do not hesitate to contact our office.

Yours faithfully

ACT Geotechnical Engineers Pty. Ltd.



Jeremy Murray
Director
Senior Geotechnical Engineer
Attachments: Figures 1 to 3, Appendix A to D



**SOUTHERN REGION LAND ENGINEERING
BRISBANE GROVE RURAL SUBDIVISION
SITE LOCALITY**

ACT Geotechnical Engineers Pty Ltd

C11822

FIGURE 1



**SOUTHERN REGION LAND ENGINEERING
BRISBANE GROVE RURAL SUBDIVISION
AERIAL PHOTOGRAPH AND BOREHOLE LOCATIONS**



**SOUTHERN REGION LAND ENGINEERING
BRISBANE GROVE RURAL SUBDIVISION
AERIAL PHOTOGRAPH AND BOREHOLE LOCATIONS**

APPENDIX A
Location and Soil Core Photos



**SOUTHERN REGION LAND ENGINEERING
BRISBANE GROVE RURAL SUBDIVISION
LOCATION AND SOIL CORE PHOTOS (A1)**



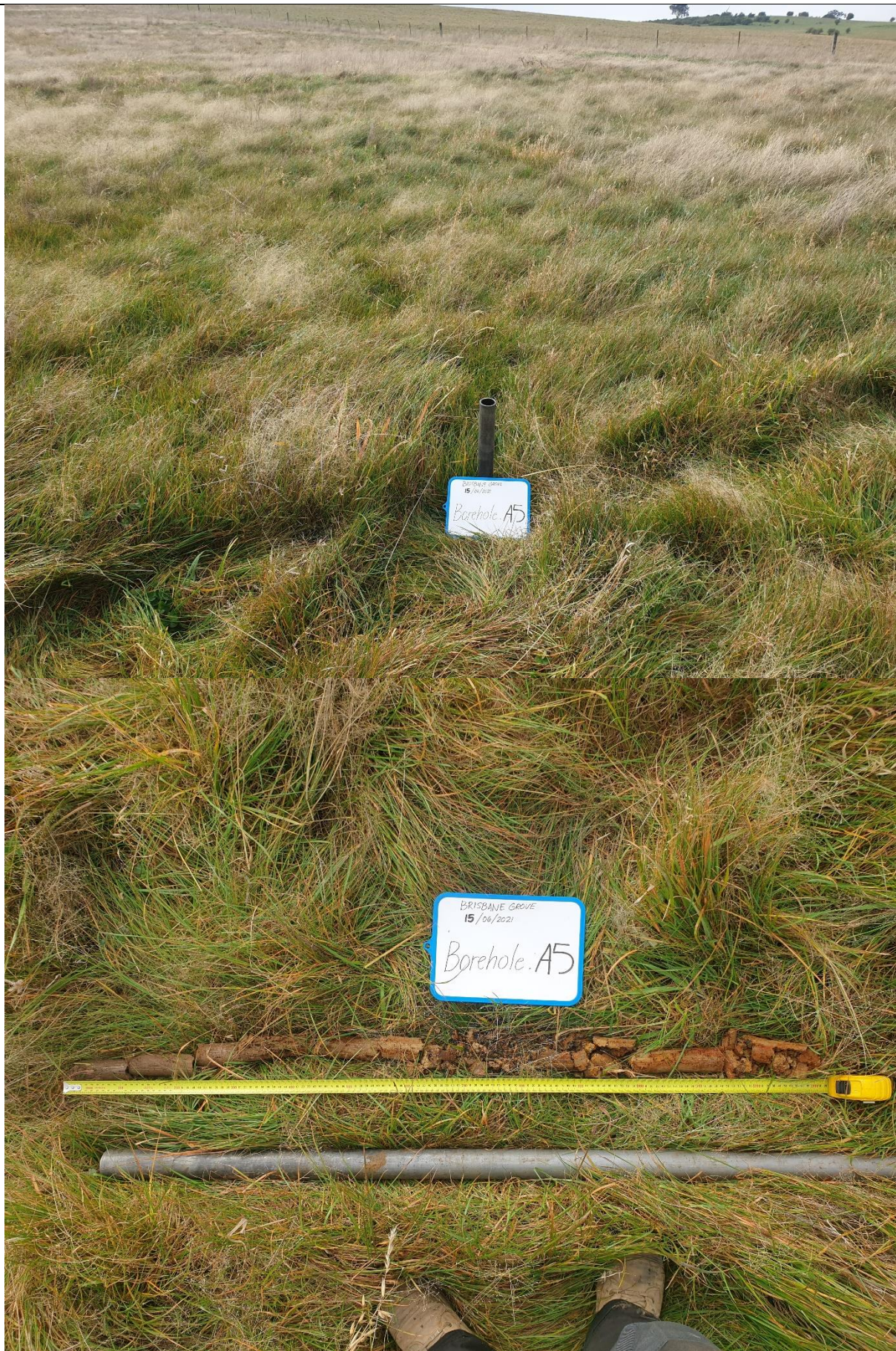
**SOUTHERN REGION LAND ENGINEERING
BRISBANE GROVE RURAL SUBDIVISION
LOCATION AND SOIL CORE PHOTOS (A2)**



**SOUTHERN REGION LAND ENGINEERING
BRISBANE GROVE RURAL SUBDIVISION
LOCATION AND SOIL CORE PHOTOS (A3)**



**SOUTHERN REGION LAND ENGINEERING
BRISBANE GROVE RURAL SUBDIVISION
LOCATION AND SOIL CORE PHOTOS (A4)**



**SOUTHERN REGION LAND ENGINEERING
BRISBANE GROVE RURAL SUBDIVISION
LOCATION AND SOIL CORE PHOTOS (A5)**



**SOUTHERN REGION LAND ENGINEERING
BRISBANE GROVE RURAL SUBDIVISION
LOCATION AND SOIL CORE PHOTOS (A6)**



**SOUTHERN REGION LAND ENGINEERING
BRISBANE GROVE RURAL SUBDIVISION
LOCATION AND SOIL CORE PHOTOS (A7)**



**SOUTHERN REGION LAND ENGINEERING
BRISBANE GROVE RURAL SUBDIVISION
LOCATION AND SOIL CORE PHOTOS (A8)**



**SOUTHERN REGION LAND ENGINEERING
BRISBANE GROVE RURAL SUBDIVISION
LOCATION AND SOIL CORE PHOTOS (A9)**



**SOUTHERN REGION LAND ENGINEERING
BRISBANE GROVE RURAL SUBDIVISION
LOCATION AND SOIL CORE PHOTOS (A10)**



**SOUTHERN REGION LAND ENGINEERING
BRISBANE GROVE RURAL SUBDIVISION
LOCATION AND SOIL CORE PHOTOS (B1)**



**SOUTHERN REGION LAND ENGINEERING
BRISBANE GROVE RURAL SUBDIVISION
LOCATION AND SOIL CORE PHOTOS (B2)**



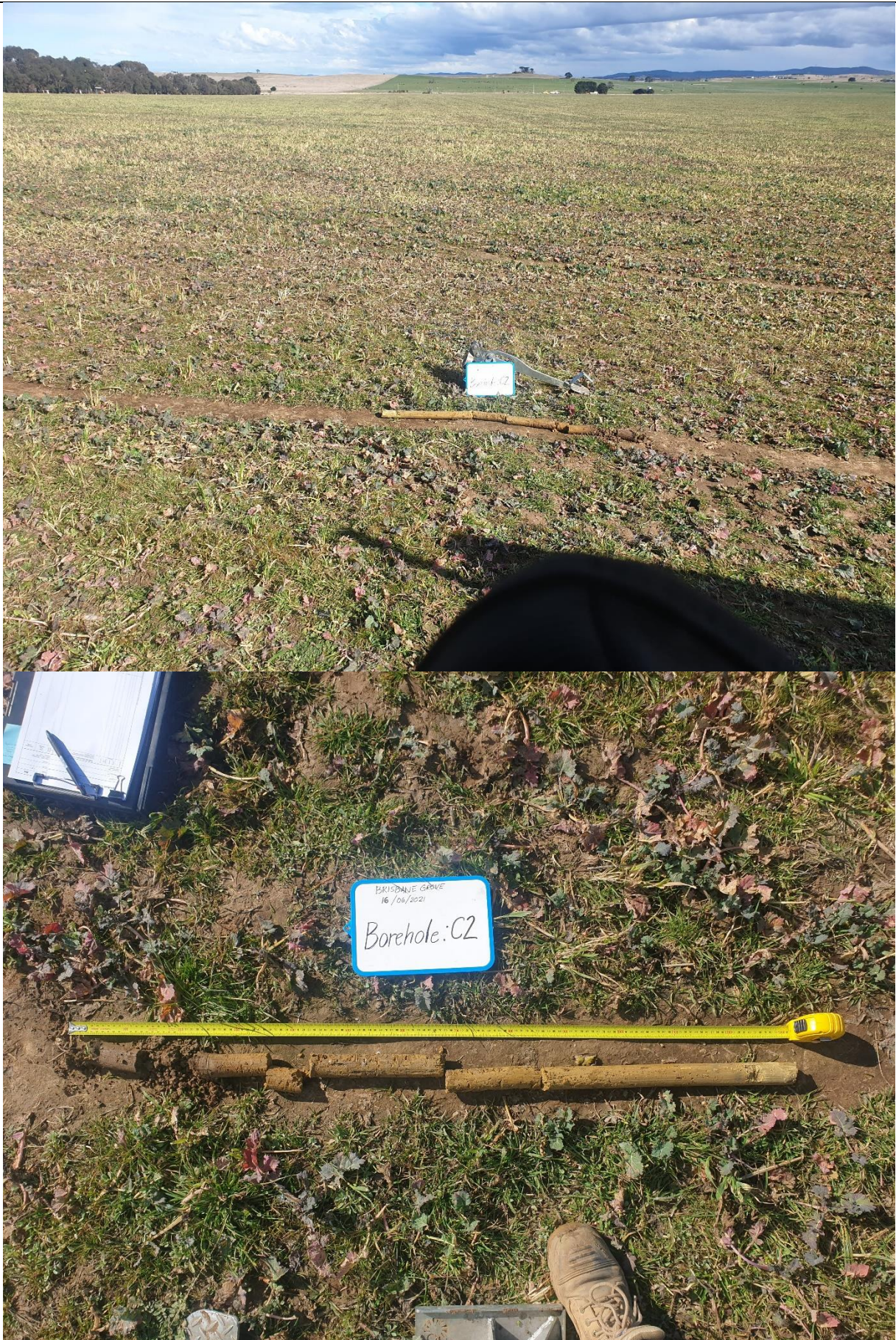
**SOUTHERN REGION LAND ENGINEERING
BRISBANE GROVE RURAL SUBDIVISION
LOCATION AND SOIL CORE PHOTOS (B3)**



**SOUTHERN REGION LAND ENGINEERING
BRISBANE GROVE RURAL SUBDIVISION
LOCATION AND SOIL CORE PHOTOS (B4)**



**SOUTHERN REGION LAND ENGINEERING
BRISBANE GROVE RURAL SUBDIVISION
LOCATION AND SOIL CORE PHOTOS (C1)**



**SOUTHERN REGION LAND ENGINEERING
BRISBANE GROVE RURAL SUBDIVISION
LOCATION AND SOIL CORE PHOTOS (C2)**



**SOUTHERN REGION LAND ENGINEERING
BRISBANE GROVE RURAL SUBDIVISION
LOCATION AND SOIL CORE PHOTOS (C3)**



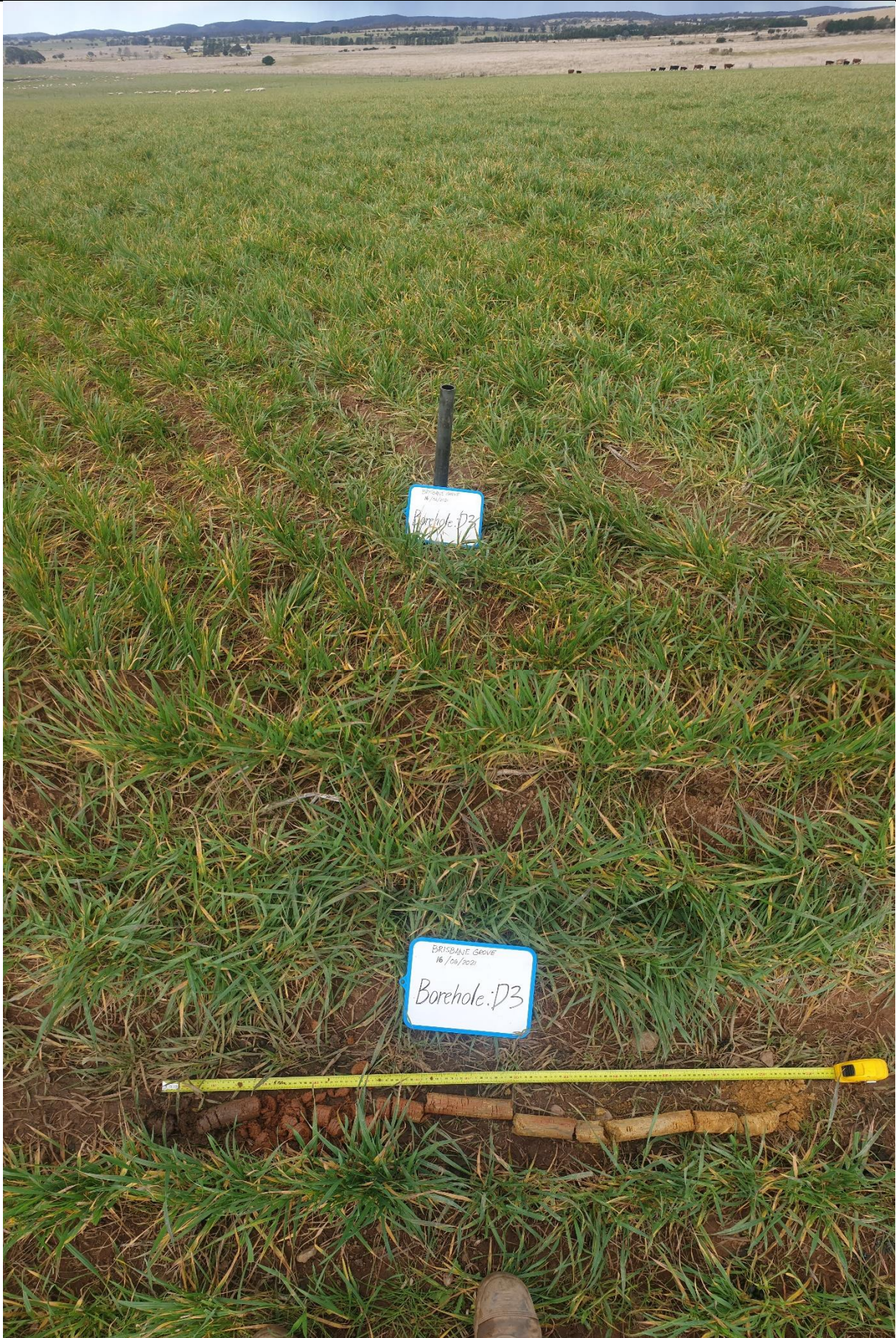
**SOUTHERN REGION LAND ENGINEERING
BRISBANE GROVE RURAL SUBDIVISION
LOCATION AND SOIL CORE PHOTOS (C4)**



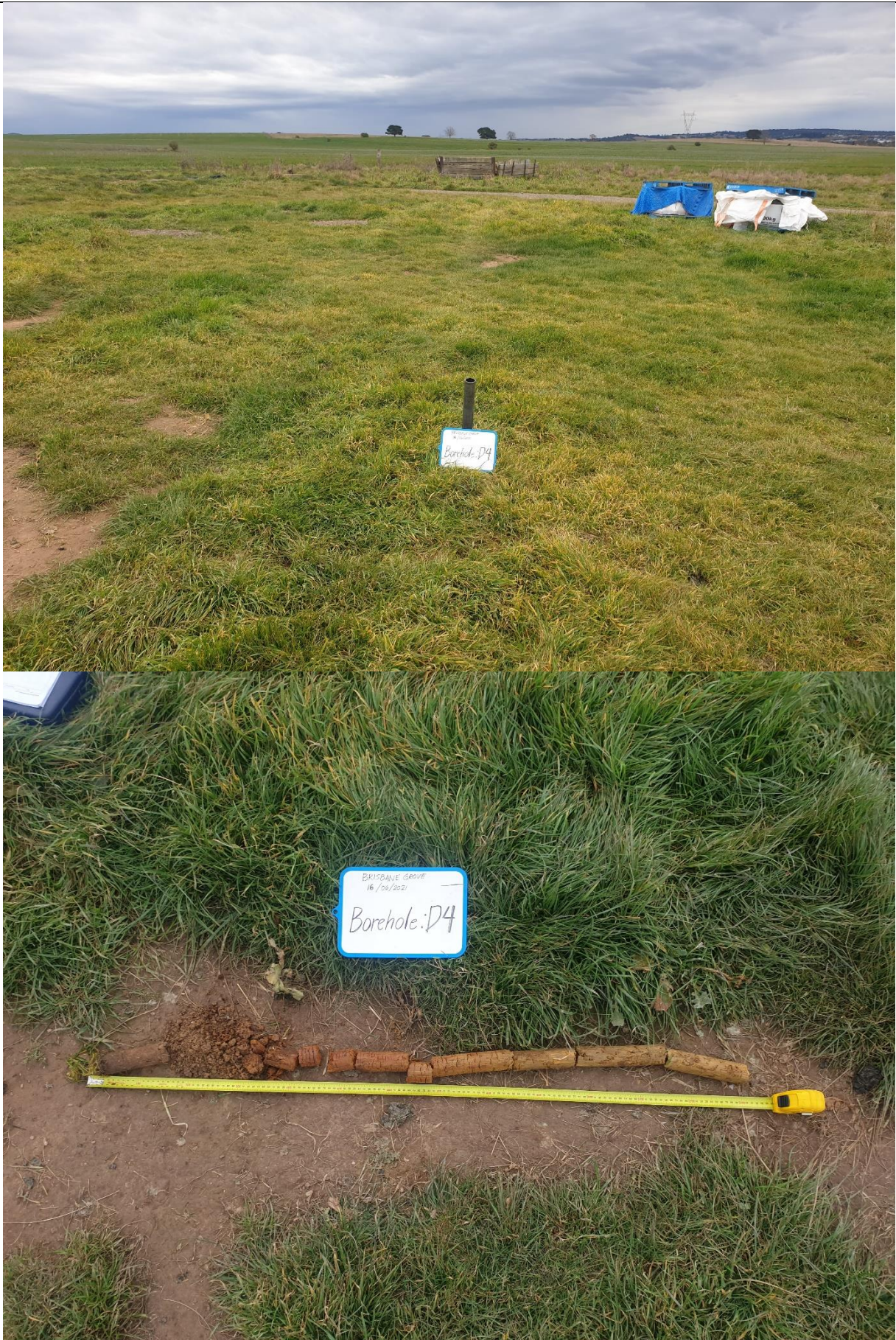
**SOUTHERN REGION LAND ENGINEERING
BRISBANE GROVE RURAL SUBDIVISION
LOCATION AND SOIL CORE PHOTOS (D1)**



**SOUTHERN REGION LAND ENGINEERING
BRISBANE GROVE RURAL SUBDIVISION
LOCATION AND SOIL CORE PHOTOS (D2)**



**SOUTHERN REGION LAND ENGINEERING
BRISBANE GROVE RURAL SUBDIVISION
LOCATION AND SOIL CORE PHOTOS (D3)**



**SOUTHERN REGION LAND ENGINEERING
BRISBANE GROVE RURAL SUBDIVISION
LOCATION AND SOIL CORE PHOTOS (D4)**



**SOUTHERN REGION LAND ENGINEERING
BRISBANE GROVE RURAL SUBDIVISION
LOCATION AND SOIL CORE PHOTOS (D5)**



**SOUTHERN REGION LAND ENGINEERING
BRISBANE GROVE RURAL SUBDIVISION
LOCATION AND SOIL CORE PHOTOS (D7)**



**SOUTHERN REGION LAND ENGINEERING
BRISBANE GROVE RURAL SUBDIVISION
LOCATION AND SOIL CORE PHOTOS (D8)**



**SOUTHERN REGION LAND ENGINEERING
BRISBANE GROVE RURAL SUBDIVISION
LOCATION AND SOIL CORE PHOTOS (D9)**



**SOUTHERN REGION LAND ENGINEERING
BRISBANE GROVE RURAL SUBDIVISION
LOCATION AND SOIL CORE PHOTOS (D10)**



**SOUTHERN REGION LAND ENGINEERING
BRISBANE GROVE RURAL SUBDIVISION
LOCATION AND SOIL CORE PHOTOS (D11)**



**SOUTHERN REGION LAND ENGINEERING
BRISBANE GROVE RURAL SUBDIVISION
LOCATION AND SOIL CORE PHOTOS (E1)**



**SOUTHERN REGION LAND ENGINEERING
BRISBANE GROVE RURAL SUBDIVISION
LOCATION AND SOIL CORE PHOTOS (E2)**



**SOUTHERN REGION LAND ENGINEERING
BRISBANE GROVE RURAL SUBDIVISION
LOCATION AND SOIL CORE PHOTOS (E3)**

APPENDIX B
Borehole Logs A01 to E03

Borehole Log

Borehole No.	A01
Sheet	1 of 1
Job No.	C11822
Location :	SEE REPORT
Collar Level :	Not Known
Angle From Vertical :	0°
Bearing :	N.A.

CLIENT:	Southern Region Land Engineering
PROJECT	Brisbane Grove Rural Subdivision Rosemont Road & Mountain Ash Road, Goulburn, NSW
Equipment Type :	PUSH TUBE DRILL
Hole Diameter :	50mm

Samples	Casing	Depth Metres	Graphic Log	U.S.C.S.	Material Description, Structure <small>Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure</small>	Consistency or Relative Density	Field Test Results	Geological Profile
		0.15		SM	Silty SAND; fine to medium grained sand, low plasticity silt, brown, with grass rootlets, moist.	LOOSE		TOPSOIL
		0.4		ML	Sandy SILT; low plasticity silt, fine to medium grained sand, light brown, light grey, moist.	FIRM		SLOPEWASH
		0.8		CH	CLAY; medium to high plasticity clay, orange-grey mottled, dry to moist.	STIFF TO VERY STIFF		RESIDUAL SOIL
		1.0		CH	CLAY; high plasticity clay, orange-grey mottled, dry.	VERY STIFF		
		1.3			BOREHOLE TERMINATED AT 1.3m			
		1.6						

BOREHOLE/EXCAVATION LOG C11822.GPJ ACT GEO.GDT 04/07/21

Logged By : KA

Date : 15/06/21

Checked By : JM

Date : 17/06/21

Borehole Log

Borehole No.	A02
Sheet	1 of 1
Job No.	C11822
Location : SEE REPORT	
Collar Level : Not Known Angle From Vertical : 0° Bearing : N.A.	

CLIENT:	Southern Region Land Engineering
PROJECT	Brisbane Grove Rural Subdivision Rosemont Road & Mountain Ash Road, Goulburn, NSW
Equipment Type : PUSH TUBE DRILL Hole Diameter : 50mm	

Samples	Casing	Depth Metres	Graphic Log	U.S.C.S.	Material Description, Structure <small>Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure</small>	Consistency or Relative Density	Field Test Results	Geological Profile
		0.1		SM	Silty SAND; fine to medium grained sand, low plasticity silt, brown, with grass rootlets, moist.	LOOSE		TOPSOIL
		0.3		ML	Silty Gravelly SAND; fine to medium grained sand, low plasticity silt, fine to medium grained sedimentary gravel, brown, dry to moist.	LOOSE TO MEDIUM DENSE		ALLUVIUM
		0.6		CL	Sandy Gravelly CLAY; low to medium plasticity clay, fine to coarse sand, fine to medium grained sedimentary gravel, orange-brown, dry.	STIFF		
		1.0		SC	Sandy CLAY / Clayey SAND; fine to coarse sand, low to medium plasticity clay, yellow-brown, orange-brown, dry.	STIFF / MEDIUM DENSE		RESIDUAL SOIL
		1.3		CH	Sandy CLAY; medium to high plasticity clay, fine to coarse sand, yellow-brown mottled orange-brown, dry.	STIFF TO VERY STIFF		
					BOREHOLE TERMINATED AT 1.3m			
		1.6						

BOREHOLE/EXCAVATION LOG C11822.GPJ ACT GEO.GDT 04/07/21

Logged By : KA

Date : 15/06/21

Checked By : JM

Date : 17/06/21

Borehole Log

Borehole No.	A03
Sheet	1 of 1
Job No.	C11822
Location :	SEE REPORT
Collar Level :	Not Known
Angle From Vertical :	0°
Bearing :	N.A.

CLIENT:	Southern Region Land Engineering
PROJECT	Brisbane Grove Rural Subdivision Rosemont Road & Mountain Ash Road, Goulburn, NSW
Equipment Type :	PUSH TUBE DRILL
Hole Diameter :	50mm

Samples	Casing	Depth Metres	Graphic Log	U.S.C.S.	Material Description, Structure <small>Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure</small>	Consistency or Relative Density	Field Test Results	Geological Profile
		0.25		SM	Silty SAND; fine to medium grained sand, low plasticity silt, brown, with grass rootlets, moist.	LOOSE		TOPSOIL
		0.5		CL	Silty Sandy CLAY; low to medium plasticity fines, fine to medium grained sand, orange-brown, moist.	FIRM TO STIFF		ALLUVIUM
		1.0		CL-CH	Sandy CLAY; medium plasticity clay, fine to coarse sand, light brown, moist to wet.	FIRM TO STIFF		
		1.1		CH	Sandy CLAY; medium to high plasticity clay, fine to coarse sand, fine gravel and ferruginous nodules, light brown, brown, dry.	VERY STIFF		
		1.4			BOREHOLE TERMINATED AT 1.4m			
		1.6						

BOREHOLE/EXCAVATION LOG C11822.GPJ ACT GEO.GDT 04/07/21

Logged By : KA	Date : 01/06/21	Checked By : JM	Date : 17/06/21
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Borehole Log

Borehole No.	A04
Sheet	1 of 1
Job No.	C11822
Location : SEE REPORT	
Collar Level : Not Known Angle From Vertical : 0° Bearing : N.A.	

CLIENT:	Southern Region Land Engineering
PROJECT	Brisbane Grove Rural Subdivision Rosemont Road & Mountain Ash Road, Goulburn, NSW
Equipment Type : PUSH TUBE DRILL Hole Diameter : 50mm	

Samples	Casing	Depth Metres	Graphic Log	U.S.C.S.	Material Description, Structure <small>Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure</small>	Consistency or Relative Density	Field Test Results	Geological Profile
		0.3		SM	Silty SAND; fine to medium grained sand, low plasticity silt, brown, with grass rootlets, moist.	LOOSE		TOPSOIL
		0.8		CL	Silty CLAY; low to medium plasticity clay, some fine to medium grained sand, yellow-brown, light brown, trace fine gravel and ferruginous nodules to 5mm, dry to moist.	STIFF		ALLUVIUM
		1.0		SC	Clayey Gravelly SAND; fine to coarse sand, fine to medium grained sedimentary gravel, low plasticity clay, red-brown, brown, dry.	MEDIUM DENSE TO DENSE		RESIDUAL SOIL
		1.4			BOREHOLE TERMINATED AT 1.4m			
		1.6						

BOREHOLE/EXCAVATION LOG C11822.GPJ ACT GEO.GDT 04/07/21

Logged By : KA	Date : 15/06/21	Checked By : JM	Date : 17/06/21
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Borehole Log

Borehole No.	A05
Sheet	1 of 1
Job No.	C11822
Location :	SEE REPORT
Collar Level :	Not Known
Angle From Vertical :	0°
Bearing :	N.A.

CLIENT:	Southern Region Land Engineering
PROJECT	Brisbane Grove Rural Subdivision Rosemont Road & Mountain Ash Road, Goulburn, NSW
Equipment Type :	PUSH TUBE DRILL
Hole Diameter :	50mm

Samples	Casing	Depth Metres	Graphic Log	U.S.C.S.	Material Description, Structure <small>Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure</small>	Consistency or Relative Density	Field Test Results	Geological Profile
		0.3		SM	Silty SAND; fine to medium grained sand, low plasticity silt, brown, with grass rootlets, moist.	LOOSE		TOPSOIL
		0.6		CL	Silty Sandy CLAY; low plasticity fines, fine to medium grained sand, light brown, moist.	FIRM TO STIFF		ALLUVIUM
		1.0		SC	Clayey Gravelly SAND; fine to coarse sand, fine gravel and ferruginous nodules, low plasticity clay, orange-brown, some grey, dry.	MEDIUM DENSE TO DENSE		RESIDUAL SOIL
		1.3			BOREHOLE TERMINATED AT 1.3m			
		1.6						

BOREHOLE/EXCAVATION LOG C11822.GPJ ACT GEO.GDT 04/07/21

Logged By :	KA	Date :	15/06/21	Checked By :	JM	Date :	17/06/21
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Borehole Log

Borehole No.	A06
Sheet	1 of 1
Job No.	C11822
Location :	SEE REPORT
Collar Level :	Not Known
Angle From Vertical :	0°
Bearing :	N.A.

CLIENT:	Southern Region Land Engineering
PROJECT	Brisbane Grove Rural Subdivision Rosemont Road & Mountain Ash Road, Goulburn, NSW
Equipment Type :	PUSH TUBE DRILL
Hole Diameter :	50mm

Samples	Casing	Depth Metres	Graphic Log	U.S.C.S.	Material Description, Structure <small>Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure</small>	Consistency or Relative Density	Field Test Results	Geological Profile
				SM	Silty SAND; fine to medium grained sand, low plasticity silt, brown, with grass rootlets, moist.	LOOSE		TOPSOIL
		0.2		ML	Sandy SILT; low plasticity silt, fine to medium grained sand, light brown, moist.	FIRM		ALLUVIUM
		0.4		CL	Silty Gravelly CLAY; low to medium plasticity fines, fine to medium grained sedimentary gravel, light brown, some red-brown, moist.	STIFF		
		0.6		CH	Sandy CLAY; medium to high plasticity clay, fine to medium grained sand, light brown, moist.	STIFF TO VERY STIFF		RESIDUAL SOIL
		0.9		SC	Clayey Gravelly SAND; fine to coarse sand, fine to medium grained gravel and ferruginous nodules, low to medium plasticity clay, light brown, orange-brown, dry to moist.	DENSE		
		1.0						
		1.4			BOREHOLE TERMINATED AT 1.4m			
		1.6						

BOREHOLE/EXCAVATION LOG C11822.GPJ ACT GEO.GDT 04/07/21

Logged By : KA

Date : 15/06/21

Checked By : JM

Date : 17/06/21

Borehole Log

Borehole No.	A07
Sheet	1 of 1
Job No.	C11822
Location : SEE REPORT	
Collar Level : Not Known Angle From Vertical : 0° Bearing : N.A.	

CLIENT:	Southern Region Land Engineering
PROJECT	Brisbane Grove Rural Subdivision Rosemont Road & Mountain Ash Road, Goulburn, NSW
Equipment Type : PUSH TUBE DRILL Hole Diameter : 50mm	

Samples	Casing	Depth Metres	Graphic Log	U.S.C.S.	Material Description, Structure <small>Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure</small>	Consistency or Relative Density	Field Test Results	Geological Profile
		0.25		SM	Silty SAND; fine to medium grained sand, low plasticity silt, brown, with grass rootlets, moist.	LOOSE		TOPSOIL
		0.5		ML	Sandy Gravelly SILT; low plasticity silt, fine to coarse sand, low plasticity silt, brown, orange-brown, dry.	LOOSE TO MEDIUM DENSE		ALLUVIUM
		1.0		SC	Clayey Gravelly SAND; fine to coarse sand, fine to medium grained sedimentary gravel, low plasticity clay, orange-brown, red-brown, dry.	MEDIUM DENSE TO DENSE		RESIDUAL SOIL
		1.4			BOREHOLE TERMINATED AT 1.4m			
		1.6						

BOREHOLE/EXCAVATION LOG C11822.GPJ ACT GEO.GDT 04/07/21

Logged By : KA	Date : 15/06/21	Checked By : JM	Date : 17/06/21
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Borehole Log

Borehole No.	A08
Sheet	1 of 1
Job No.	C11822
Location : SEE REPORT	
Collar Level : Not Known Angle From Vertical : 0° Bearing : N.A.	

CLIENT:	Southern Region Land Engineering
PROJECT	Brisbane Grove Rural Subdivision Rosemont Road & Mountain Ash Road, Goulburn, NSW
Equipment Type : PUSH TUBE DRILL Hole Diameter : 50mm	

Samples	Casing	Depth Metres	Graphic Log	U.S.C.S.	Material Description, Structure <small>Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure</small>	Consistency or Relative Density	Field Test Results	Geological Profile
		0.15		SM	Silty SAND; fine to medium grained sand, low plasticity silt, brown, with grass rootlets, moist.	LOOSE		TOPSOIL
		0.7		CL	Sandy Silty CLAY; low to medium plasticity fines, fine to medium grained sand, red-brown, dry.	FIRM		ALLUVIUM
		1.0		CL	Sandy CLAY; low to medium plasticity clay, fine to coarse sand, yellow-brown mottled orange-brown, dry.	STIFF		RESIDUAL SOIL
		1.4			BOREHOLE TERMINATED AT 1.4m			
		1.6						

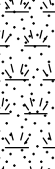



BOREHOLE/EXCAVATION LOG C11822.GPJ ACT GEO.GDT 04/07/21

Logged By : KA	Date : 15/06/21	Checked By : JM	Date : 17/06/21
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Borehole Log

Borehole No.	A09
Sheet	1 of 1
Job No.	C11822
Location :	SEE REPORT
Collar Level :	Not Known
Angle From Vertical :	0°
Bearing :	N.A.

CLIENT:	Southern Region Land Engineering
PROJECT	Brisbane Grove Rural Subdivision Rosemont Road & Mountain Ash Road, Goulburn, NSW
Equipment Type :	PUSH TUBE DRILL
Hole Diameter :	50mm

Samples	Casing	Depth Metres	Graphic Log	U.S.C.S.	Material Description, Structure <small>Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure</small>	Consistency or Relative Density	Field Test Results	Geological Profile
				SM	Silty SAND; fine to medium grained sand, low plasticity silt, brown, with grass rootlets, moist.	LOOSE		TOPSOIL
		0.2		SM	Silty Gravelly SAND; fine to coarse sand, low plasticity silt, fine gravel and ferruginous nodules, grey, dry.	LOOSE TO MEDIUM DENSE		ALLUVIUM
		0.8		CL	Silty Gravelly CLAY; low plasticity fines, fine gravel and ferruginous nodules, grey/black, dry.	STIFF		RESIDUAL SOIL
		1.0						
		1.2		CL-CH	Sandy CLAY; fine to medium grained sand, medium plasticity clay, orange-grey mottled, dry.	VERY STIFF		
		1.3			BOREHOLE TERMINATED AT 1.3m			
		1.6						

BOREHOLE/EXCAVATION LOG C11822.GPJ ACT GEO.GDT 04/07/21

Logged By :	KA	Date :	15/06/21	Checked By :	JM	Date :	17/06/21
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Borehole Log

Borehole No.	A10
Sheet	1 of 1
Job No.	C11822
Location :	SEE REPORT
Collar Level :	Not Known
Angle From Vertical :	0°
Bearing :	N.A.

CLIENT:	Southern Region Land Engineering
PROJECT	Brisbane Grove Rural Subdivision Rosemont Road & Mountain Ash Road, Goulburn, NSW
Equipment Type :	PUSH TUBE DRILL
Hole Diameter :	50mm

Samples	Casing	Depth Metres	Graphic Log	U.S.C.S.	Material Description, Structure <small>Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure</small>	Consistency or Relative Density	Field Test Results	Geological Profile
		0.2		SM	Silty SAND; fine to medium grained sand, low plasticity silt, brown, with grass rootlets, moist.	LOOSE		TOPSOIL
		0.7		CL	Sandy Silty CLAY; low plasticity fines, fine to medium grained sand, light brown, moist to wet.	FIRM		ALLUVIUM
		1.0		CL-CH	Sandy CLAY; medium plasticity clay, fine to medium grained sand, trace ferruginous nodules to 5mm, orange-grey mottled, dry.	STIFF		RESIDUAL SOIL
		1.2		SC	Clayey Gravelly SAND; fine to coarse sand, low plasticity clay, fine to coarse gravel and quartz, orange-grey, dry.	DENSE		
		1.6			BOREHOLE TERMINATED AT 1.2m refusal			

BOREHOLE/EXCAVATION LOG C11822.GPJ ACT GEO.GDT 04/07/21

Logged By :	KA	Date :	15/06/21	Checked By :	JM	Date :	17/06/21
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Borehole Log

Borehole No.	B01
Sheet	1 of 1
Job No.	C11822
Location :	SEE REPORT
Collar Level :	Not Known
Angle From Vertical :	0°
Bearing :	N.A.

CLIENT:	Southern Region Land Engineering
PROJECT	Brisbane Grove Rural Subdivision Rosemont Road & Mountain Ash Road, Goulburn, NSW
Equipment Type :	PUSH TUBE DRILL
Hole Diameter :	50mm

Samples	Casing	Depth Metres	Graphic Log	U.S.C.S.	Material Description, Structure <small>Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure</small>	Consistency or Relative Density	Field Test Results	Geological Profile
				SM	Silty SAND; fine to medium grained sand, low plasticity silt, dark brown, with grass rootlets, moist.	LOOSE		TOPSOIL
		0.2		SC	Clayey Gravelly SAND; fine to coarse sand, low plasticity clay, fine to medium grained sedimentary gravel, brown, red-brown, moist.	MEDIUM DENSE		COLLUVIUM
		0.6		CL	Sandy CLAY; low to medium plasticity clay, fine to coarse sand, brown, dry.	STIFF TO VERY STIFF		RESIDUAL SOIL
		1.0			Extremely Weathered (EW) SANDSTONE; fine to medium grained, light brown, dry.	EXTREMELY WEAK		
		1.1			BOREHOLE TERMINATED AT 1.1m refusal			
		1.6						

BOREHOLE/EXCAVATION LOG C11822.GPJ ACT GEO.GDT 04/07/21

Logged By :	KA	Date :	15/06/21	Checked By :	JM	Date :	17/06/21
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Borehole Log

Borehole No.	B02
Sheet	1 of 1
Job No.	C11822
Location :	SEE REPORT
Collar Level :	Not Known
Angle From Vertical :	0°
Bearing :	N.A.

CLIENT:	Southern Region Land Engineering
PROJECT	Brisbane Grove Rural Subdivision Rosemont Road & Mountain Ash Road, Goulburn, NSW
Equipment Type :	PUSH TUBE DRILL
Hole Diameter :	50mm

Samples	Casing	Depth Metres	Graphic Log	U.S.C.S.	Material Description, Structure <small>Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure</small>	Consistency or Relative Density	Field Test Results	Geological Profile
				SM	Silty SAND; fine to medium grained sand, low plasticity silt, brown, with grass rootlets, moist.	LOOSE		TOPSOIL
		0.2		CL	Silty Sandy CLAY; low plasticity fines, fine sand, light brown, moist.	FIRM		ALLUVIUM
		0.5		CL	Sandy CLAY; low to medium plasticity clay, fine to coarse sand, trace fine gravel and ferruginous nodules, red-brown, light brown, some orange, dry to moist.	STIFF		
		1.0						
		1.4						
		1.6			BOREHOLE TERMINATED AT 1.4m			

BOREHOLE/EXCAVATION LOG C11822.GPJ ACT GEO.GDT 04/07/21

Logged By :	KA	Date :	01/06/21	Checked By :	JM	Date :	17/06/21
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Borehole Log

Borehole No.	B03
Sheet	1 of 1
Job No.	C11822
Location :	SEE REPORT
Collar Level :	Not Known
Angle From Vertical :	0°
Bearing :	N.A.

CLIENT:	Southern Region Land Engineering
PROJECT	Brisbane Grove Rural Subdivision Rosemont Road & Mountain Ash Road, Goulburn, NSW
Equipment Type :	PUSH TUBE DRILL
Hole Diameter :	50mm

Samples	Casing	Depth Metres	Graphic Log	U.S.C.S.	Material Description, Structure <small>Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure</small>	Consistency or Relative Density	Field Test Results	Geological Profile
				SM	Silty SAND; fine to medium grained sand, low plasticity silt, brown, with grass rootlets, moist.	LOOSE		TOPSOIL
		0.2		CL	Silty Sandy CLAY; low plasticity fines, fine to medium grained sand, light brown, moist to wet.	SOFT TO FIRM		ALLUVIUM
		0.6		CH	Sandy CLAY; medium to high plasticity clay, fine to coarse sand, orange-brown, dry.	STIFF TO VERY STIFF		
		0.8		CL-CH	Sandy CLAY; medium plasticity clay, fine to coarse sand, orange-brown, light brown, dry.	VERY STIFF TO HARD		
		1.0						
		1.2						
		1.6			BOREHOLE TERMINATED AT 1.2m very slow progress			

BOREHOLE/EXCAVATION LOG C11822.GPJ ACT GEO.GDT 04/07/21

Logged By :	KA	Date :	01/06/21	Checked By :	JM	Date :	17/06/21
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Borehole Log

Borehole No.	B04
Sheet	1 of 1
Job No.	C11822
Location : SEE REPORT	
Collar Level : Not Known Angle From Vertical : 0° Bearing : N.A.	

CLIENT:	Southern Region Land Engineering
PROJECT	Brisbane Grove Rural Subdivision Rosemont Road & Mountain Ash Road, Goulburn, NSW
Equipment Type : PUSH TUBE DRILL Hole Diameter : 50mm	

Samples	Casing	Depth Metres	Graphic Log	U.S.C.S.	Material Description, Structure <small>Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure</small>	Consistency or Relative Density	Field Test Results	Geological Profile
				SM	Silty SAND; fine to medium grained sand, low plasticity silt, brown, with grass rootlets, moist.	LOOSE		TOPSOIL
		0.2		SC-SM	Silty Clayey SAND; fine to medium grained sand, low plasticity silt, light brown, dry to moist.	LOOSE		SLOPEWASH
		0.3		CL	Sandy Gravelly CLAY; low to medium plasticity clay, fine sand, fine grained gravel and ferruginous nodules, light grey, moist.	FIRM TO STIFF		ALLUVIUM
		0.8		CL-CH	Sandy CLAY; medium plasticity clay, fine to medium grained sand, orange-grey mottled, some red-brown, dry.	STIFF TO VERY STIFF		
		1.0						
		1.4						
		1.6						
					BOREHOLE TERMINATED AT 1.4m			

BOREHOLE/EXCAVATION LOG C11822.GPJ ACT GEO.GDT 04/07/21

Logged By : KA	Date : 01/06/21	Checked By : JM	Date : 17/06/21
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Borehole Log

Borehole No.	C01
Sheet	1 of 1
Job No.	C11822
Location : SEE REPORT	
Collar Level : Not Known Angle From Vertical : 0° Bearing : N.A.	

CLIENT:	Southern Region Land Engineering
PROJECT	Brisbane Grove Rural Subdivision Rosemont Road & Mountain Ash Road, Goulburn, NSW
Equipment Type : PUSH TUBE DRILL Hole Diameter : 50mm	

Samples	Casing	Depth Metres	Graphic Log	U.S.C.S.	Material Description, Structure <small>Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure</small>	Consistency or Relative Density	Field Test Results	Geological Profile
				SM	Silty SAND; fine to medium grained sand, low plasticity silt, brown, with grass rootlets, moist.	LOOSE		TOPSOIL
		0.2		SM	Silty Gravelly SAND; fine to coarse sand, low plasticity silt, fine to medium grained sedimentary gravel, grey/brown, dry to moist.	MEDIUM DENSE		ALLUVIUM
		0.3		CH	Sandy CLAY; medium to high plasticity clay, fine to coarse sand, yellow-brown mottled red-brown, dry.	VERY STIFF		RESIDUAL SOIL
		0.5		SC	Clayey Gravelly SAND; fine to coarse sand, low to medium plasticity clay, fine to medium grained sedimentary gravel, yellow-brown, dry.	DENSE		
		0.9						
		1.0			BOREHOLE TERMINATED AT 0.9m refusal			
		1.6						




BOREHOLE/EXCAVATION LOG C11822.GPJ ACT GEO.GDT 04/07/21

Logged By : KA	Date : 16/06/21	Checked By : JM	Date : 17/06/21
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Borehole Log

Borehole No.	C02
Sheet	1 of 1
Job No.	C11822
Location : SEE REPORT	
Collar Level : Not Known Angle From Vertical : 0° Bearing : N.A.	

CLIENT:	Southern Region Land Engineering
PROJECT	Brisbane Grove Rural Subdivision Rosemont Road & Mountain Ash Road, Goulburn, NSW
Equipment Type : PUSH TUBE DRILL Hole Diameter : 50mm	

Samples	Casing	Depth Metres	Graphic Log	U.S.C.S.	Material Description, Structure <small>Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure</small>	Consistency or Relative Density	Field Test Results	Geological Profile
		0.15		SM	Silty SAND; fine to medium grained sand, low plasticity silt, brown, with grass rootlets, moist.	LOOSE		TOPSOIL
		0.3		SM	Silty Gravelly SAND; fine to coarse sand, fine gravel and ferruginous nodules, low plasticity silt, grey, moist.	LOOSE TO MEDIUM DENSE		ALLUVIUM
		0.85		CH	Sandy CLAY; medium to high plasticity clay, fine to coarse sand, light brown, some orange-brown, dry to moist.	STIFF TO VERY STIFF		RESIDUAL SOIL
		1.0						
		1.3						
		1.6						
					BOREHOLE TERMINATED AT 1.3m			

BOREHOLE/EXCAVATION LOG C11822.GPJ ACT GEO.GDT 04/07/21

Logged By : KA

Date : 16/06/21





Checked By : JM

Date : 17/06/21

Borehole Log

Borehole No.	C03
Sheet	1 of 1
Job No.	C11822
Location : SEE REPORT	
Collar Level : Not Known Angle From Vertical : 0° Bearing : N.A.	

CLIENT:	Southern Region Land Engineering
PROJECT	Brisbane Grove Rural Subdivision Rosemont Road & Mountain Ash Road, Goulburn, NSW
Equipment Type : PUSH TUBE DRILL Hole Diameter : 50mm	

Samples	Casing	Depth Metres	Graphic Log	U.S.C.S.	Material Description, Structure <small>Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure</small>	Consistency or Relative Density	Field Test Results	Geological Profile
				SM	Silty SAND; fine to medium grained sand, low plasticity silt, brown, with grass rootlets, moist.	LOOSE		TOPSOIL
		0.2		SM	Silty Gravelly SAND; fine to medium grained sand, low plasticity silt, fine gravel and ferruginous nodules, dark brown, dry to moist.	LOOSE		ALLUVIUM
		0.5		CL-CH	Sandy CLAY; medium plasticity clay, fine to coarse sand, orange-brown, some red, dry to moist.	STIFF		
		1.0						
		1.1		CH	Sandy CLAY; medium to high plasticity clay, fine to coarse sand, grey-orange mottled, dry.	VERY STIFF		RESIDUAL SOIL
		1.4						
					BOREHOLE TERMINATED AT 1.4m			
		1.6						

BOREHOLE/EXCAVATION LOG C11822.GPJ ACT GEO.GDT 04/07/21

Logged By : KA	Date : 16/06/21	Checked By : JM	Date : 17/06/21
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Borehole Log

Borehole No.	C04
Sheet	1 of 1
Job No.	C11822
Location :	SEE REPORT
Collar Level :	Not Known
Angle From Vertical :	0°
Bearing :	N.A.

CLIENT:	Southern Region Land Engineering
PROJECT	Brisbane Grove Rural Subdivision Rosemont Road & Mountain Ash Road, Goulburn, NSW
Equipment Type :	PUSH TUBE DRILL
Hole Diameter :	50mm

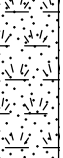



Samples	Casing	Depth Metres	Graphic Log	U.S.C.S.	Material Description, Structure <small>Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure</small>	Consistency or Relative Density	Field Test Results	Geological Profile
		0.3		SM	Silty SAND; fine to medium grained sand, low plasticity silt, brown, with grass rootlets, moist.	LOOSE		TOPSOIL
		0.6		ML	Clayey Sandy SILT; low to medium plasticity fines, fine to medium grained sand, fine gravel and ferruginous nodules, light brown, moist to wet.	FIRM		ALLUVIUM
		1.0		CH	Silty CLAY; medium to high plasticity fines, orange-grey mottled, dry to moist.	VERY STIFF		RESIDUAL SOIL
		1.3			BOREHOLE TERMINATED AT 1.3m			
		1.6						

BOREHOLE/EXCAVATION LOG C11822.GPJ ACT GEO.GDT 04/07/21

Borehole Log

Borehole No.	D01
Sheet	1 of 1
Job No.	C11822
Location :	SEE REPORT
Collar Level :	Not Known
Angle From Vertical :	0°
Bearing :	N.A.

CLIENT:	Southern Region Land Engineering
PROJECT	Brisbane Grove Rural Subdivision Rosemont Road & Mountain Ash Road, Goulburn, NSW
Equipment Type :	PUSH TUBE DRILL
Hole Diameter :	50mm

Samples	Casing	Depth Metres	Graphic Log	U.S.C.S.	Material Description, Structure <small>Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure</small>	Consistency or Relative Density	Field Test Results	Geological Profile
				SM	Silty SAND; fine to medium grained sand, low plasticity silt, brown, with grass rootlets, moist.	LOOSE		TOPSOIL
		0.2		ML	Clayey Sandy SILT; low plasticity fines, fine to medium grained sand, brown, moist to wet.	FIRM		ALLUVIUM
		0.5		CL	Silty Gravelly CLAY; low to medium plasticity fines, fine gravel and ferruginous nodules, light brown, moist.	FIRM TO STIFF		
		0.7		CH	Sandy CLAY; medium to high plasticity clay, fine to medium grained sand, orange-brown, orange-grey, dry to moist.	VERY STIFF		RESIDUAL SOIL
		1.0						
		1.3						
					BOREHOLE TERMINATED AT 1.3m			
		1.6						

BOREHOLE/EXCAVATION LOG C11822.GPJ ACT GEO.GDT 04/07/21

Logged By : KA	Date : 17/06/21	Checked By : JM	Date : 17/06/21
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Borehole Log

Borehole No.	D02
Sheet	1 of 1
Job No.	C11822
Location :	SEE REPORT
Collar Level :	Not Known
Angle From Vertical :	0°
Bearing :	N.A.

CLIENT:	Southern Region Land Engineering
PROJECT	Brisbane Grove Rural Subdivision Rosemont Road & Mountain Ash Road, Goulburn, NSW
Equipment Type :	PUSH TUBE DRILL
Hole Diameter :	50mm

Samples	Casing	Depth Metres	Graphic Log	U.S.C.S.	Material Description, Structure <small>Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure</small>	Consistency or Relative Density	Field Test Results	Geological Profile
		0.2		SM	Silty SAND; fine to medium grained sand, low plasticity silt, brown, with grass rootlets, moist.	LOOSE		TOPSOIL
		0.7		SM	Silty Gravelly SAND; fine to medium grained sand, low plasticity silt, fine gravel and ferruginous nodules, light brown, moist.	LOOSE		ALLUVIUM
		1.0		CH	Sandy CLAY; medium to high plasticity clay, fine to coarse sand, some fine gravel and ferruginous nodules, orange-grey mottled, dry to moist.	VERY STIFF		RESIDUAL SOIL
		1.3						
		1.6			BOREHOLE TERMINATED AT 1.3m			

BOREHOLE/EXCAVATION LOG C11822.GPJ ACT GEO.GDT 04/07/21

Logged By :	KA	Date :	17/06/21	Checked By :	JM	Date :	17/06/21
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Borehole Log

Borehole No.	D03
Sheet	1 of 1
Job No.	C11822
Location :	SEE REPORT
Collar Level :	Not Known
Angle From Vertical :	0°
Bearing :	N.A.

CLIENT:	Southern Region Land Engineering
PROJECT	Brisbane Grove Rural Subdivision Rosemont Road & Mountain Ash Road, Goulburn, NSW
Equipment Type :	PUSH TUBE DRILL
Hole Diameter :	50mm

Samples	Casing	Depth Metres	Graphic Log	U.S.C.S.	Material Description, Structure <small>Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure</small>	Consistency or Relative Density	Field Test Results	Geological Profile
		0.15		SM	Silty SAND; fine to medium grained sand, low plasticity silt, brown, with grass rootlets, moist.	LOOSE		TOPSOIL
		0.5		CH	Sandy CLAY; medium to high plasticity clay, fine to coarse sand, red-brown, dry to moist.	STIFF TO VERY STIFF		RESIDUAL SOIL
		1.0		CH	Silty CLAY; medium to high plasticity fines, some fine to medium grained sand, yellow-brown/grey, dry to moist.	VERY STIFF		
		1.3		CL-CH	Sandy Gravelly CLAY; medium plasticity clay, fine to coarse sand, fine to medium grained sedimentary gravel, yellow-brown, dry.	VERY STIFF TO HARD		
		1.6			BOREHOLE TERMINATED AT 1.3m			

BOREHOLE/EXCAVATION LOG C11822.GPJ ACT GEO.GDT 04/07/21

Logged By :	KA	Date :	16/06/21	Checked By :	JM	Date :	17/06/21
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Borehole Log

Borehole No.	D04
Sheet	1 of 1
Job No.	C11822
Location :	SEE REPORT
Collar Level :	Not Known
Angle From Vertical :	0°
Bearing :	N.A.

CLIENT:	Southern Region Land Engineering
PROJECT	Brisbane Grove Rural Subdivision Rosemont Road & Mountain Ash Road, Goulburn, NSW
Equipment Type :	PUSH TUBE DRILL
Hole Diameter :	50mm

Samples	Casing	Depth Metres	Graphic Log	U.S.C.S.	Material Description, Structure <small>Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure</small>	Consistency or Relative Density	Field Test Results	Geological Profile
				SM	Silty SAND; fine to medium grained sand, low plasticity silt, brown, with grass rootlets, moist.	LOOSE		TOPSOIL
		0.2		SM	Silty Gravelly SAND; fine to medium grained sand, fine gravel and ferruginous nodules, low plasticity silt, light brown, brown, dry.	LOOSE TO MEDIUM DENSE		ALLUVIUM
		0.3		CH	Sandy CLAY; medium to high plasticity clay, fine sand, orange-brown, dry to moist.	VERY STIFF		RESIDUAL SOIL
		0.7		CH	CLAY; high plasticity clay, trace fine gravel and ferruginous nodules, light brown, dry.	VERY STIFF TO HARD		
		1.0						
		1.3						
					BOREHOLE TERMINATED AT 1.3m			
		1.6						

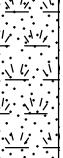



BOREHOLE/EXCAVATION LOG C11822.GPJ ACT GEO.GDT 04/07/21

Logged By :	KA	Date :	16/06/21	Checked By :	JM	Date :	17/06/21
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Borehole Log

Borehole No.	D05
Sheet	1 of 1
Job No.	C11822
Location :	SEE REPORT
Collar Level :	Not Known
Angle From Vertical :	0°
Bearing :	N.A.

CLIENT:	Southern Region Land Engineering
PROJECT	Brisbane Grove Rural Subdivision Rosemont Road & Mountain Ash Road, Goulburn, NSW
Equipment Type :	PUSH TUBE DRILL
Hole Diameter :	50mm

Samples	Casing	Depth Metres	Graphic Log	U.S.C.S.	Material Description, Structure <small>Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure</small>	Consistency or Relative Density	Field Test Results	Geological Profile
				SM	Silty SAND; fine to medium grained sand, low plasticity silt, brown, with grass rootlets, moist.	LOOSE		TOPSOIL
		0.2		ML	Gravelly Sandy SILT; low plasticity silt, fine to medium grained sand, fine gravel & ferruginous nodules, light brown, yellow-brown, dry.	LOOSE TO MEDIUM DENSE		ALLUVIUM
		0.6		SC	Gravelly Clayey SAND; fine to coarse sand, fine to medium grained gravel and ferruginous nodules, low plasticity clay, orange-grey, orange-brown, dry.	MEDIUM DENSE		
		1.0						
		1.1		CH	Sandy CLAY; medium to high plasticity clay, fine to medium grained sand, orange-grey mottled, dry to moist.	VERY STIFF		RESIDUAL SOIL
		1.3						
					BOREHOLE TERMINATED AT 1.3m			
		1.6						

BOREHOLE/EXCAVATION LOG C11822.GPJ ACT GEO.GDT 04/07/21

Logged By :	KA	Date :	16/06/21	Checked By :	JM	Date :	17/06/21
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Borehole Log

Borehole No.	D07
Sheet	1 of 1
Job No.	C11822
Location : SEE REPORT	
Collar Level : Not Known Angle From Vertical : 0° Bearing : N.A.	

CLIENT:	Southern Region Land Engineering
PROJECT	Brisbane Grove Rural Subdivision Rosemont Road & Mountain Ash Road, Goulburn, NSW
Equipment Type : PUSH TUBE DRILL Hole Diameter : 50mm	

Samples	Casing	Depth Metres	Graphic Log	U.S.C.S.	Material Description, Structure <small>Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure</small>	Consistency or Relative Density	Field Test Results	Geological Profile
				SM	Silty SAND; fine to medium grained sand, low plasticity silt, brown, with grass rootlets, moist.	LOOSE		TOPSOIL
		0.2		CL	Silty Sandy CLAY; low plasticity fines, fine to medium grained sand, light brown, moist.	FIRM		ALLUVIUM
		0.4		SM	Silty Gravelly SAND; fine to medium grained sand, low plasticity silt, fine gravel & ferruginous nodules, light brown, orange-brown, dry to moist.	MEDIUM DENSE		
		0.6		CH	Sandy CLAY; high plasticity clay, fine to medium grained sand, orange-brown, light brown, dry to moist.	VERY STIFF		RESIDUAL SOIL
		1.0						
		1.3						
					BOREHOLE TERMINATED AT 1.3m			
		1.6						

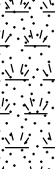



BOREHOLE/EXCAVATION LOG C11822.GPJ ACT GEO.GDT 04/07/21

Logged By : KA	Date : 16/06/21	Checked By : JM	Date : 17/06/21
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Borehole Log

Borehole No.	D08
Sheet	1 of 1
Job No.	C11822
Location :	SEE REPORT
Collar Level :	Not Known
Angle From Vertical :	0°
Bearing :	N.A.

CLIENT:	Southern Region Land Engineering
PROJECT	Brisbane Grove Rural Subdivision Rosemont Road & Mountain Ash Road, Goulburn, NSW
Equipment Type :	PUSH TUBE DRILL
Hole Diameter :	50mm

Samples	Casing	Depth Metres	Graphic Log	U.S.C.S.	Material Description, Structure <small>Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure</small>	Consistency or Relative Density	Field Test Results	Geological Profile
				SM	Silty SAND; fine to medium grained sand, low plasticity silt, brown, with grass rootlets, moist.	LOOSE		TOPSOIL
		0.2		SC-SM	Silty Clayey SAND; fine to coarse sand, low plasticity fines, dark brown, red-brown, dry to moist.	LOOSE TO MEDIUM DENSE		ALLUVIUM
		0.8		SC	Clayey Gravelly SAND; fine to coarse sand, medium plasticity clay, fine to medium grained sedimentary gravel, brown, light brown, dry.	DENSE		RESIDUAL SOIL
		1.0						
		1.2			Extremely Weathered (EW) SILTSTONE; fine to medium grained, light brown, dry.	EXTREMELY WEAK		BEDROCK
		1.3			BOREHOLE TERMINATED AT 1.3m			
		1.6						

BOREHOLE/EXCAVATION LOG C11822.GPJ ACT GEO.GDT 04/07/21

Logged By : KA	Date : 17/06/21	Checked By : JM	Date : 17/06/21
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Borehole Log

Borehole No.	D09
Sheet	1 of 1
Job No.	C11822
Location : SEE REPORT	
Collar Level : Not Known Angle From Vertical : 0° Bearing : N.A.	

CLIENT:	Southern Region Land Engineering
PROJECT	Brisbane Grove Rural Subdivision Rosemont Road & Mountain Ash Road, Goulburn, NSW
Equipment Type : PUSH TUBE DRILL Hole Diameter : 50mm	

Samples	Casing	Depth Metres	Graphic Log	U.S.C.S.	Material Description, Structure <small>Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure</small>	Consistency or Relative Density	Field Test Results	Geological Profile
				SM	Silty SAND; fine to medium grained sand, low plasticity silt, brown, with grass rootlets, moist.	LOOSE		TOPSOIL
		0.2		SM	Silty Gravelly SAND; fine to medium grained sand, low plasticity silt, fine gravel and ferruginous nodules, light brown, moist.	LOOSE		ALLUVIUM
		0.4		CL	Sandy Gravelly CLAY; low to medium plasticity clay, fine to coarse sand, fine gravel and ferruginous nodules, orange-brown, light brown, moist.	STIFF TO VERY STIFF		RESIDUAL SOIL
		1.0						
		1.2		CH	Sandy CLAY; medium to high plasticity clay, fine to coarse sand, orange-grey, dry.	VERY STIFF		
		1.3						
					BOREHOLE TERMINATED AT 1.3m			
		1.6						

BOREHOLE/EXCAVATION LOG C11822.GPJ ACT GEO.GDT 04/07/21

Logged By : KA	Date : 17/06/21	Checked By : JM	Date : 17/06/21
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Borehole Log

Borehole No.	D10
Sheet	1 of 1
Job No.	C11822
Location :	SEE REPORT
Collar Level :	Not Known
Angle From Vertical :	0°
Bearing :	N.A.

CLIENT:	Southern Region Land Engineering
PROJECT	Brisbane Grove Rural Subdivision Rosemont Road & Mountain Ash Road, Goulburn, NSW
Equipment Type :	PUSH TUBE DRILL
Hole Diameter :	50mm

Samples	Casing	Depth Metres	Graphic Log	U.S.C.S.	Material Description, Structure <small>Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure</small>	Consistency or Relative Density	Field Test Results	Geological Profile
		0.2		SM	Silty SAND; fine to medium grained sand, low plasticity silt, brown, with grass rootlets, moist.	LOOSE		TOPSOIL
		0.8		CH	Silty CLAY; high plasticity fines, light brown, dry.	VERY STIFF		RESIDUAL SOIL
		1.0		CH	Silty CLAY; high plasticity fines, orange-brown, dry.	VERY STIFF TO HARD		
		1.4						
		1.6			BOREHOLE TERMINATED AT 1.4m			

BOREHOLE/EXCAVATION LOG C11822.GPJ ACT GEO.GDT 04/07/21

Logged By :	KA	Date :	16/06/21	Checked By :	JM	Date :	17/06/21
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Borehole Log

Borehole No.	D11
Sheet	1 of 1
Job No.	C11822
Location :	SEE REPORT
Collar Level :	Not Known
Angle From Vertical :	0°
Bearing :	N.A.

CLIENT:	Southern Region Land Engineering
PROJECT	Brisbane Grove Rural Subdivision Rosemont Road & Mountain Ash Road, Goulburn, NSW
Equipment Type :	PUSH TUBE DRILL
Hole Diameter :	50mm

Samples	Casing	Depth Metres	Graphic Log	U.S.C.S.	Material Description, Structure <small>Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure</small>	Consistency or Relative Density	Field Test Results	Geological Profile
		0.3		SM	Silty SAND; fine to medium grained sand, low plasticity silt, brown, with grass rootlets, moist.	LOOSE		TOPSOIL
		0.5		CL	Silty CLAY; low to medium plasticity fines, light brown, moist.	FIRM		ALLUVIUM
		0.7		CL	Silty Gravelly CLAY; low plasticity fines, fine gravel and ferruginous nodules, orange-brown, dry to moist.	FIRM		RESIDUAL SOIL
		1.0		CH	Sandy CLAY; medium to high plasticity clay, fine to coarse sand, orange-grey mottled, dry.	VERY STIFF		
		1.4			BOREHOLE TERMINATED AT 1.4m			
		1.6						

BOREHOLE/EXCAVATION LOG C11822.GPJ ACT GEO.GDT 04/07/21

Logged By :	KA	Date :	16/06/21	Checked By :	JM	Date :	17/06/21
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Borehole Log

Borehole No.	E01
Sheet	1 of 1
Job No.	C11822
Location : SEE REPORT	
Collar Level : Not Known Angle From Vertical : 0° Bearing : N.A.	

CLIENT:	Southern Region Land Engineering
PROJECT	Brisbane Grove Rural Subdivision Rosemont Road & Mountain Ash Road, Goulburn, NSW
Equipment Type : PUSH TUBE DRILL Hole Diameter : 50mm	

Samples	Casing	Depth Metres	Graphic Log	U.S.C.S.	Material Description, Structure <small>Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure</small>	Consistency or Relative Density	Field Test Results	Geological Profile
		0.3		SM	Silty SAND; fine to medium grained sand, low plasticity silt, brown, dark brown, with grass rootlets, moist.	LOOSE		TOPSOIL
		0.5		CL	Silty Sandy CLAY; low plasticity fines, fine to coarse sand, trace fine gravel and ferruginous nodules, light brown, moist.	FIRM		ALLUVIUM
		0.7		CL-CH	Sandy Gravelly CLAY; medium plasticity clay, fine to coarse sand, fine to coarse sedimentary gravel, yellow-brown, dry to moist.	STIFF TO VERY STIFF		RESIDUAL SOIL
		1.0		CH	Sandy CLAY; medium to high plasticity clay, fine to coarse sand, orange-grey mottled, brown, dry.	VERY STIFF		
		1.3			BOREHOLE TERMINATED AT 1.3m			
		1.6						

BOREHOLE/EXCAVATION LOG C11822.GPJ ACT GEO.GDT 04/07/21

Logged By : KA

Date : 17/06/21

Checked By : JM

Date : 17/06/21

Borehole Log

Borehole No.	E02
Sheet	1 of 1
Job No.	C11822
Location :	SEE REPORT
Collar Level :	Not Known
Angle From Vertical :	0°
Bearing :	N.A.

CLIENT:	Southern Region Land Engineering
PROJECT	Brisbane Grove Rural Subdivision Rosemont Road & Mountain Ash Road, Goulburn, NSW
Equipment Type :	PUSH TUBE DRILL
Hole Diameter :	50mm

Samples	Casing	Depth Metres	Graphic Log	U.S.C.S.	Material Description, Structure <small>Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure</small>	Consistency or Relative Density	Field Test Results	Geological Profile
				SM	Silty SAND; fine to medium grained sand, low plasticity silt, brown, dark brown, with grass rootlets, moist.	LOOSE		TOPSOIL
		0.2		CL	Silty Sandy CLAY; low plasticity fines, fine to medium grained sand, brown, light brown, moist.	FIRM		ALLUVIUM
		0.5		CL	Silty Gravelly CLAY; low to medium plasticity fines, fine gravel and ferruginous nodules, light brown, moist to wet.	FIRM		
		0.9		CH	Sandy CLAY; medium to high plasticity clay, fine to coarse sand, trace fine sedimentary gravel and ferruginous nodules, orange-grey mottled, dry to moist.	STIFF TO VERY STIFF		RESIDUAL
		1.0						
		1.3						
					BOREHOLE TERMINATED AT 1.3m			
		1.6						

BOREHOLE/EXCAVATION LOG C11822.GPJ ACT GEO.GDT 04/07/21

Logged By : KA Date : 17/06/21 Checked By : JM Date : 17/06/21

Borehole Log

Borehole No.	E03
Sheet	1 of 1
Job No.	C11822
Location : SEE REPORT	
Collar Level : Not Known Angle From Vertical : 0° Bearing : N.A.	

CLIENT:	Southern Region Land Engineering
PROJECT	Brisbane Grove Rural Subdivision Rosemont Road & Mountain Ash Road, Goulburn, NSW
Equipment Type : PUSH TUBE DRILL Hole Diameter : 50mm	

Samples	Casing	Depth Metres	Graphic Log	U.S.C.S.	Material Description, Structure <small>Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure</small>	Consistency or Relative Density	Field Test Results	Geological Profile
		0.15		SM	Silty SAND; fine to medium grained sand, low plasticity silt, brown, dark brown, with grass rootlets, moist.	LOOSE		TOPSOIL
		0.4		CL	Sandy CLAY; low plasticity clay, fine to medium grained sand, orange-brown, trace gravel to 10mm, moist.	FIRM		ALLUVIUM
		0.8		CL-CH	Sandy Gravelly CLAY; medium plasticity clay, fine to coarse sand, fine gravel and ferruginous nodules, dry to moist.	STIFF		RESIDUAL SOIL
		1.0		SC	Clayey SAND / Sandy CLAY; low to medium plasticity clay, fine to coarse sand, fine sedimentary gravel, dry.	VERY STIFF / DENSE		
		1.3			BOREHOLE TERMINATED AT 1.3m			
		1.6						

BOREHOLE/EXCAVATION LOG C11822.GPJ ACT GEO.GDT 04/07/21

Logged By : KA	Date : 16/06/21	Checked By : JM	Date : 17/06/21
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APPENDIX C
Laboratory Test Certificates

Organochlorine Pesticides in soil						
Our Reference		272356-6	272356-7	272356-8	272356-9	272356-10
Your Reference	UNITS	A6	B4	C2	D2	D4
Depth		0.0-0.2m	0.0-0.2m	0.0-0.4m	0.0-0.2m	0.0-0.2m
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	25/06/2021	25/06/2021	25/06/2021	25/06/2021	25/06/2021
Date analysed	-	25/06/2021	25/06/2021	25/06/2021	25/06/2021	25/06/2021
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	98	92	94	92	93

Organophosphorus Pesticides in Soil						
Our Reference	UNITS	272356-6	272356-7	272356-8	272356-9	272356-10
Your Reference		A6	B4	C2	D2	D4
Depth		0.0-0.2m	0.0-0.2m	0.0-0.4m	0.0-0.2m	0.0-0.2m
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	25/06/2021	25/06/2021	25/06/2021	25/06/2021	25/06/2021
Date analysed	-	25/06/2021	25/06/2021	25/06/2021	25/06/2021	25/06/2021
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	98	92	94	92	93

Misc Inorg - Soil						
Our Reference		272356-1	272356-2	272356-3	272356-4	272356-5
Your Reference	UNITS	A7	A10	B2	D3	D11
Depth		0.1-0.4m	0.0-0.3m	0.3-0.6m	0.15-0.4m	0.3-0.5m
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	29/06/2021	29/06/2021	29/06/2021	29/06/2021	29/06/2021
Date analysed	-	29/06/2021	29/06/2021	29/06/2021	29/06/2021	29/06/2021
pH 1:5 soil:water	pH Units	6.5	5.3	5.5	5.8	6.8
Electrical Conductivity 1:5 soil:water	µS/cm	36	52	34	46	52
Emerson Class No.	-	5.0	5.0	5.0	5.0	5.0
Phosphorus Sorption Capacity	mg/kg	510	380	590	940	770

APPENDIX D
Limitations of Geotechnical Report

Limitations in the Use and Interpretation of this Geotechnical Report

Our Professional services were performed, our findings obtained, and our recommendations prepared in accordance with generally accepted engineering principles and practices. This warranty is in lieu of all other warranties, either expressed or implied.

The geotechnical report was prepared for the use of the Owner in the design of the subject development and should be made available to potential contractors and/or the Contractor for information on factual data only. This report should not be used for contractual purposes as a warranty of interpreted subsurface conditions such as those indicated by the interpretive borehole and test pit logs, cross- sections, or discussion of subsurface conditions contained herein.

The analyses, conclusions and recommendations contained in the report are based on site conditions as they presently exist and assume that the exploratory bore holes, test pits, and/or probes are representative of the subsurface conditions of the site. If, during construction, subsurface conditions are found which are significantly different from those observed in the exploratory bore holes and test pits, or assumed to exist in the excavations, we should be advised at once so that we can review these conditions and reconsider our recommendations where necessary. If there is a substantial lapse of time between conducting this investigation and the start of work at the site, or if conditions have changed due to natural causes or construction operations at or adjacent to the site, this report should be reviewed to determine the applicability of the conclusions and the recommendations considering the changed conditions and time lapse.

The summary bore hole and test pit logs are our opinion of the subsurface conditions revealed by periodic sampling of the ground as the test holes progressed. The soil descriptions and interfaces between strata are interpretive and actual changes may be gradual.

The bore hole and test pit logs and related information depict subsurface conditions only at the specific locations and at the particular time designated on the logs. Soil conditions at the other locations may differ from conditions occurring at these bore hole and test pit locations. Also, the passage of time may result in a change in the soil conditions at these test locations.

Groundwater levels often vary seasonally. Groundwater levels reported on the boring logs or in the body of the report are factual data only for the dates shown.

Unanticipated soil conditions are commonly encountered on construction sites and cannot be fully anticipated by merely taking soil samples, bore holes or test pits. Such unexpected conditions frequently require that additional expenditures be made to attain a properly constructed project. It is recommended that the Owner consider providing a contingency fund to accommodate such potential extra costs.

This firm cannot be responsible for any deviation from the intent of this report including, but not restricted to, any changes to the scheduled time of construction, the nature of the project or the specific construction methods or means indicated in this report: nor can our company be responsible for any construction activity on sites other than the specific site referred to in this report.

ATTACHMENT C
NorBE Assessment
Wastewater Effluent Model Summaries

WEM Summary

version 3

General Information

WEM model ID	2334112	Associated DA number	
Model description			
Consultancy	Southern Region Land Engineering	Consultant	gregtodd.srle@gmail.com
Consultant reference number	T01405		
Council	Goulburn Mulwaree	Assessing officer	
Nominated lot	2//835278	Associated lots	
Development class	Subdivision unsewered >=4 lots		

Lot	Section	Plan
2		835278
1		835278
1		731427
22		811954
23		811954
24		811954
3		835278
1		779194
103		70346
104		126140
105		126140
1		853498
106		126140

Date of model run

WEM Model Run Summary

Model run outcome **Pending**

Any of the sub-surface plumes reaches:

Lot boundary	N/A
Drainage depression	N/A
Top bank of watercourse	N/A
Another disposal field or onsite stormwater management system	N/A
Within 50m, and up gradient of, a licensed drinking water bore	N/A

Proposed Front End Design

Length (across slope)(m)	40.0	Width (up slope)(m)	20.0
Proposed area(m2)	800.0	Minimum Required area (m2)	730.0
Number of trenches	0		

WEM Summary

version 3

Effluent volume proposed (l/day)	800
Effluent volume calculated (l/day)	800

WEM Model Inputs

Location

Easting	9551687.974039	Northing	4326432.862298
Slope (m/m)	0.06959	Slope is suitable based on site inspection (Applicable to some disposal systems on steep slopes)	N/A

Development

Development type	Dwellings	Development detail	4 bedrooms
Water supply type	Rainwater	Spa Bath	No
Continuous system use	Yes		
Treatment system	AWTS standard	Disposal system	Irrigation sub-surface

Site

Lot size(m2)	4000		
Subject to severe frost	No	Bulk density(g/cm3)	2.00
Vegetation for nutrient uptake	Lawn - unmanaged	Phosphorus sorption (mg/kg)	510
Soil depth (to impermeable layer) (m)	1.30	Soil structure	Strong
Saturated hydraulic conductivity (Ksat)(m/day)	0.06		
Soil texture	Med-heavy clays		

Effluent disposal risk factors

Depth to water table	> 1.0
Flood potential of disposal system	Above 1 in 50 year ARI
Landform score	Hill crests, convex side slopes and plains
Run-on and upslope seepage	None-low, diversion possible
Rock outcrops, scarp and bedrock	< 5%
Distance to drainage depression	> 50
Distance to watercourses and water supply reservoirs	> 120
Distance to licenced drinking water bores	> 150

WEM Plume Map

No image of the plumes is available. This may be because the model has not yet been run or because no image was generated when the model ran.

WEM Summary

version 3

General Information

WEM model ID	2334111	Associated DA number			
Model description					
Consultancy	Southern Region Land Engineering	Consultant	gregtodd.srle@gmail.com		
Consultant reference number	T01405				
Council	Goulburn Mulwaree	Assessing officer			
Nominated lot	2//835278	Associated lots	Lot	Section	Plan
Development class	Subdivision unsewered >=4 lots		2		835278
			1		835278
			1		731427
			22		811954
			23		811954
			24		811954
			3		835278
			1		779194
			103		70346
			104		126140
			105		126140
			1		853498
			106		126140

Date of model run

WEM Model Run Summary

Model run outcome **Pending**

Any of the sub-surface plumes reaches:

Lot boundary	N/A
Drainage depression	N/A
Top bank of watercourse	N/A
Another disposal field or onsite stormwater management system	N/A
Within 50m, and up gradient of, a licensed drinking water bore	N/A

Proposed Front End Design

Length (across slope)(m)	50.0	Width (up slope)(m)	26.0
Proposed area(m ²)	1300.0	Minimum Required area (m ²)	1187.0
Number of trenches	0		

WEM Summary

version 3

Effluent volume proposed (l/day)	1300
Effluent volume calculated (l/day)	1300

WEM Model Inputs

Location

Easting	9551687.974039	Northing	4326432.862298
Slope (m/m)	0.06959	Slope is suitable based on site inspection (Applicable to some disposal systems on steep slopes)	N/A

Development

Development type	Dwellings	Development detail	4 bedrooms
Water supply type	Rainwater	Spa Bath	Yes
Continuous system use	Yes		
Treatment system	AWTS standard	Disposal system	Irrigation sub-surface

Site

Lot size(m2)	4000		
Subject to severe frost	No	Bulk density(g/cm3)	2.00
Vegetation for nutrient uptake	Lawn - unmanaged	Phosphorus sorption (mg/kg)	510
Soil depth (to impermeable layer) (m)	1.30	Soil structure	Strong
Saturated hydraulic conductivity (Ksat)(m/day)	1.31		
Soil texture	Med-heavy clays		

Effluent disposal risk factors

Depth to water table	> 1.0
Flood potential of disposal system	Above 1 in 50 year ARI
Landform score	Hill crests, convex side slopes and plains
Run-on and upslope seepage	None-low, diversion possible
Rock outcrops, scarp and bedrock	< 5%
Distance to drainage depression	> 50
Distance to watercourses and water supply reservoirs	> 120
Distance to licenced drinking water bores	> 150

WEM Plume Map

No image of the plumes is available. This may be because the model has not yet been run or because no image was generated when the model ran.

WEM Summary

version 3

General Information

WEM model ID	2334110	Associated DA number			
Model description					
Consultancy	Southern Region Land Engineering	Consultant	gregtodd.srle@gmail.com		
Consultant reference number	T01405				
Council	Goulburn Mulwaree	Assessing officer			
Nominated lot	2//835278	Associated lots	Lot	Section	Plan
Development class	Subdivision unsewered >=4 lots		2		835278
			1		835278
			1		731427
			22		811954
			23		811954
			24		811954
			3		835278
			1		779194
			103		70346
			104		126140
			105		126140
			1		853498
			106		126140

Date of model run

WEM Model Run Summary

Model run outcome **Pending**

Any of the sub-surface plumes reaches:

Lot boundary	N/A
Drainage depression	N/A
Top bank of watercourse	N/A
Another disposal field or onsite stormwater management system	N/A
Within 50m, and up gradient of, a licensed drinking water bore	N/A

Proposed Front End Design

Length (across slope)(m)	40.0	Width (up slope)(m)	20.0
Proposed area(m ²)	800.0	Minimum Required area (m ²)	730.0
Number of trenches	0		

WEM Summary

version 3

Effluent volume proposed (l/day)	800
Effluent volume calculated (l/day)	800

WEM Model Inputs

Location

Easting	9551687.974039	Northing	4326432.862298
Slope (m/m)	0.06959	Slope is suitable based on site inspection (Applicable to some disposal systems on steep slopes)	N/A

Development

Development type	Dwellings	Development detail	4 bedrooms
Water supply type	Rainwater	Spa Bath	No
Continuous system use	Yes		
Treatment system	AWTS standard	Disposal system	Irrigation sub-surface

Site

Lot size(m2)	4000		
Subject to severe frost	No	Bulk density(g/cm3)	2.00
Vegetation for nutrient uptake	Lawn - unmanaged	Phosphorus sorption (mg/kg)	510
Soil depth (to impermeable layer) (m)	1.30	Soil structure	Strong
Saturated hydraulic conductivity (Ksat)(m/day)	1.31		
Soil texture	Med-heavy clays		

Effluent disposal risk factors

Depth to water table	> 1.0
Flood potential of disposal system	Above 1 in 50 year ARI
Landform score	Hill crests, convex side slopes and plains
Run-on and upslope seepage	None-low, diversion possible
Rock outcrops, scarp and bedrock	< 5%
Distance to drainage dpression	> 50
Distance to watercourses and water supply reservoirs	> 120
Distance to licenced drinking water bores	> 150

WEM Plume Map

No image of the plumes is available. This may be because the model has not yet been run or because no image was generated when the model ran.

WEM Summary

version 3

General Information

WEM model ID	2334818	Associated DA number			
Model description					
Consultancy	Southern Region Land Engineering	Consultant	gregtodd.srle@gmail.com		
Consultant reference number	T01405				
Council	Goulburn Mulwaree	Assessing officer			
Nominated lot	2//835278	Associated lots	Lot	Section	Plan
Development class	Subdivision unsewered >=4 lots		2		835278
			1		835278
			1		731427
			22		811954
			23		811954
			24		811954
			3		835278
			1		779194
			103		70346
			104		126140
			105		126140
			1		853498
			106		126140

Date of model run

WEM Model Run Summary

Model run outcome **Pending**

Any of the sub-surface plumes reaches:

Lot boundary	N/A
Drainage depression	N/A
Top bank of watercourse	N/A
Another disposal field or onsite stormwater management system	N/A
Within 50m, and up gradient of, a licensed drinking water bore	N/A

Proposed Front End Design

Length (across slope)(m)	40.0	Width (up slope)(m)	20.0
Proposed area(m ²)	800.0	Minimum Required area (m ²)	730.0
Number of trenches	0		

WEM Summary

version 3

Effluent volume proposed (l/day)	800
Effluent volume calculated (l/day)	800

WEM Model Inputs

Location

Easting	9551146.503076	Northing	4326517.820624
Slope (m/m)	0.04222	Slope is suitable based on site inspection (Applicable to some disposal systems on steep slopes)	N/A

Development

Development type	Dwellings	Development detail	4 bedrooms
Water supply type	Rainwater	Spa Bath	No
Continuous system use	Yes		
Treatment system	AWTS standard	Disposal system	Irrigation sub-surface

Site

Lot size(m2)	4000		
Subject to severe frost	No	Bulk density(g/cm3)	1.80
Vegetation for nutrient uptake	Lawn - unmanaged	Phosphorus sorption (mg/kg)	380
Soil depth (to impermeable layer) (m)	1.30	Soil structure	Moderate
Saturated hydraulic conductivity (Ksat)(m/day)	1.30		
Soil texture	Light clays		

Effluent disposal risk factors

Depth to water table	> 1.0
Flood potential of disposal system	Above 1 in 50 year ARI
Landform score	Hill crests, convex side slopes and plains
Run-on and upslope seepage	None-low, diversion possible
Rock outcrops, scarp and bedrock	< 5%
Distance to drainage depression	> 50
Distance to watercourses and water supply reservoirs	> 120
Distance to licenced drinking water bores	> 150

WEM Plume Map

No image of the plumes is available. This may be because the model has not yet been run or because no image was generated when the model ran.

WEM Summary

version 3

General Information

WEM model ID	2334823	Associated DA number			
Model description					
Consultancy	Southern Region Land Engineering	Consultant	gregtodd.srle@gmail.com		
Consultant reference number	T01405				
Council	Goulburn Mulwaree	Assessing officer			
Nominated lot	2//835278	Associated lots	Lot	Section	Plan
Development class	Subdivision unsewered >=4 lots		2		835278
			1		835278
			1		731427
			22		811954
			23		811954
			24		811954
			3		835278
			1		779194
			103		70346
			104		126140
			105		126140
			1		853498
			106		126140

Date of model run

WEM Model Run Summary

Model run outcome **Pending**

Any of the sub-surface plumes reaches:

Lot boundary	N/A
Drainage depression	N/A
Top bank of watercourse	N/A
Another disposal field or onsite stormwater management system	N/A
Within 50m, and up gradient of, a licensed drinking water bore	N/A

Proposed Front End Design

Length (across slope)(m)	40.0	Width (up slope)(m)	20.0
Proposed area(m ²)	800.0	Minimum Required area (m ²)	730.0
Number of trenches	0		

WEM Summary

version 3

Effluent volume proposed (l/day)	800
Effluent volume calculated (l/day)	800

WEM Model Inputs

Location

Easting	9551146.503076	Northing	4326517.820624
Slope (m/m)	0.04222	Slope is suitable based on site inspection (Applicable to some disposal systems on steep slopes)	N/A

Development

Development type	Dwellings	Development detail	4 bedrooms
Water supply type	Rainwater	Spa Bath	No
Continuous system use	Yes		
Treatment system	AWTS standard	Disposal system	Irrigation sub-surface

Site

Lot size(m2)	4000		
Subject to severe frost	No	Bulk density(g/cm3)	1.80
Vegetation for nutrient uptake	Lawn - unmanaged	Phosphorus sorption (mg/kg)	380
Soil depth (to impermeable layer) (m)	1.30	Soil structure	Moderate
Saturated hydraulic conductivity (Ksat)(m/day)	0.06		
Soil texture	Light clays		

Effluent disposal risk factors

Depth to water table	> 1.0
Flood potential of disposal system	Above 1 in 50 year ARI
Landform score	Hill crests, convex side slopes and plains
Run-on and upslope seepage	None-low, diversion possible
Rock outcrops, scarp and bedrock	< 5%
Distance to drainage depression	> 50
Distance to watercourses and water supply reservoirs	> 120
Distance to licenced drinking water bores	> 150

WEM Plume Map

No image of the plumes is available. This may be because the model has not yet been run or because no image was generated when the model ran.

WEM Summary

version 3

General Information

WEM model ID	2334824	Associated DA number	
Model description			
Consultancy	Southern Region Land Engineering	Consultant	gregtodd.srle@gmail.com
Consultant reference number	T01405		
Council	Goulburn Mulwaree	Assessing officer	
Nominated lot	2//835278	Associated lots	
Development class	Subdivision unsewered >=4 lots		

Lot	Section	Plan
2		835278
1		835278
1		731427
22		811954
23		811954
24		811954
3		835278
1		779194
103		70346
104		126140
105		126140
1		853498
106		126140

Date of model run

WEM Model Run Summary

Model run outcome **Pending**

Special design criteria, including soil modification and soil permeability testing, will be required

Any of the sub-surface plumes reaches:

Lot boundary	N/A
Drainage depression	N/A
Top bank of watercourse	N/A
Another disposal field or onsite stormwater management system	N/A
Within 50m, and up gradient of, a licensed drinking water bore	N/A

Proposed Front End Design

Length (across slope)(m)	20.0	Width (up slope)(m)	3.8
Proposed area(m ²)	150.0	Minimum Required area (m ²)	120.0
Number of trenches	2		

WEM Summary

version 3

Effluent volume proposed (l/day)	400
Effluent volume calculated (l/day)	600

WEM Model Inputs

Location

Easting	9551146.503076	Northing	4326517.820624
Slope (m/m)	0.04222	Slope is suitable based on site inspection (Applicable to some disposal systems on steep slopes)	N/A

Development

Development type	Dwellings	Development detail	3 bedrooms
Water supply type	Rainwater	Spa Bath	No
Continuous system use	Yes		
Treatment system	Septic tank	Disposal system	Absorption trench – primary effluent

Site

Lot size(m2)	4000		
Subject to severe frost	No	Bulk density(g/cm3)	1.80
Vegetation for nutrient uptake	Lawn - unmanaged	Phosphorus sorption (mg/kg)	380
Soil depth (to impermeable layer) (m)	1.30	Soil structure	Moderate
Saturated hydraulic conductivity (Ksat)(m/day)	0.06		
Soil texture	Light clays		

Effluent disposal risk factors

Depth to water table	> 1.0
Flood potential of disposal system	Above 1 in 50 year ARI
Landform score	Hill crests, convex side slopes and plains
Run-on and upslope seepage	None-low, diversion possible
Rock outcrops, scarp and bedrock	< 5%
Distance to drainage depression	> 50
Distance to watercourses and water supply reservoirs	> 120
Distance to licenced drinking water bores	> 150

WEM Plume Map

WEM Summary

version 3

General Information

WEM model ID	2334825	Associated DA number			
Model description					
Consultancy	Southern Region Land Engineering	Consultant	gregtodd.srle@gmail.com		
Consultant reference number	T01405				
Council	Goulburn Mulwaree	Assessing officer			
Nominated lot	2//835278	Associated lots	Lot	Section	Plan
Development class	Subdivision unsewered >=4 lots		2		835278
			1		835278
			1		731427
			22		811954
			23		811954
			24		811954
			3		835278
			1		779194
			103		70346
			104		126140
			105		126140
			1		853498
			106		126140

Date of model run

WEM Model Run Summary

Model run outcome **Pending**

Any of the sub-surface plumes reaches:

Lot boundary	N/A
Drainage depression	N/A
Top bank of watercourse	N/A
Another disposal field or onsite stormwater management system	N/A
Within 50m, and up gradient of, a licensed drinking water bore	N/A

Proposed Front End Design

Length (across slope)(m)	40.0	Width (up slope)(m)	20.0
Proposed area(m ²)	800.0	Minimum Required area (m ²)	730.0
Number of trenches	0		

WEM Summary

version 3

Effluent volume proposed (l/day)	800
Effluent volume calculated (l/day)	800

WEM Model Inputs

Location

Easting	9551253.127413	Northing	4326145.975520
Slope (m/m)	0.05111	Slope is suitable based on site inspection (Applicable to some disposal systems on steep slopes)	N/A

Development

Development type	Dwellings	Development detail	4 bedrooms
Water supply type	Rainwater	Spa Bath	No
Continuous system use	Yes		
Treatment system	AWTS standard	Disposal system	Irrigation sub-surface

Site

Lot size(m2)	4000		
Subject to severe frost	No	Bulk density(g/cm3)	1.60
Vegetation for nutrient uptake	Lawn - unmanaged	Phosphorus sorption (mg/kg)	500
Soil depth (to impermeable layer) (m)	1.40	Soil structure	Weak
Saturated hydraulic conductivity (Ksat)(m/day)	1.00		
Soil texture	Clay loams		

Effluent disposal risk factors

Depth to water table	> 1.0
Flood potential of disposal system	Above 1 in 50 year ARI
Landform score	Concave side slopes and foot slopes
Run-on and upslope seepage	None-low, diversion possible
Rock outcrops, scarp and bedrock	< 5%
Distance to drainage depression	> 50
Distance to watercourses and water supply reservoirs	> 120
Distance to licenced drinking water bores	> 150

WEM Plume Map

No image of the plumes is available. This may be because the model has not yet been run or because no image was generated when the model ran.

WEM Summary

version 3

General Information

WEM model ID	2334828	Associated DA number			
Model description	Concept effluent treatment				
Consultancy	Southern Region Land Engineering	Consultant	gregtodd.srle@gmail.com		
Consultant reference number	T01405				
Council	Goulburn Mulwaree	Assessing officer			
Nominated lot	1//853498	Associated lots	Lot	Section	Plan
Development class	Subdivision unsewered >=4 lots		2		835278
			1		835278
			1		731427
			22		811954
			23		811954
			24		811954
			3		835278
			1		779194
			103		70346
			104		126140
			105		126140
			1		853498
			106		126140

Date of model run

WEM Model Run Summary

Model run outcome **Pending**

Any of the sub-surface plumes reaches:

Lot boundary	N/A
Drainage depression	N/A
Top bank of watercourse	N/A
Another disposal field or onsite stormwater management system	N/A
Within 50m, and up gradient of, a licensed drinking water bore	N/A

Proposed Front End Design

Length (across slope)(m)	40.0	Width (up slope)(m)	20.0
Proposed area(m ²)	800.0	Minimum Required area (m ²)	730.0
Number of trenches	0		

WEM Summary

version 3

Effluent volume proposed (l/day)	800
Effluent volume calculated (l/day)	800

WEM Model Inputs

Location

Easting	9550898.493270	Northing	4326683.866589
Slope (m/m)	0.02291	Slope is suitable based on site inspection (Applicable to some disposal systems on steep slopes)	N/A

Development

Development type	Dwellings	Development detail	4 bedrooms
Water supply type	Rainwater	Spa Bath	No
Continuous system use	Yes		
Treatment system	AWTS standard	Disposal system	Irrigation sub-surface

Site

Lot size(m2)	4000		
Subject to severe frost	No	Bulk density(g/cm3)	1.60
Vegetation for nutrient uptake	Lawn - unmanaged	Phosphorus sorption (mg/kg)	380
Soil depth (to impermeable layer) (m)	1.20	Soil structure	Weak
Saturated hydraulic conductivity (Ksat)(m/day)	0.20		
Soil texture	Clay loams		

Effluent disposal risk factors

Depth to water table	> 1.0
Flood potential of disposal system	Above 1 in 50 year ARI
Landform score	Hill crests, convex side slopes and plains
Run-on and upslope seepage	None-low, diversion possible
Rock outcrops, scarp and bedrock	< 5%
Distance to drainage depression	> 50
Distance to watercourses and water supply reservoirs	> 120
Distance to licenced drinking water bores	> 150

WEM Plume Map

No image of the plumes is available. This may be because the model has not yet been run or because no image was generated when the model ran.

WEM Summary

version 3

General Information

WEM model ID	2335120	Associated DA number			
Model description	Concept effluent management				
Consultancy	Southern Region Land Engineering	Consultant	gregtodd.srle@gmail.com		
Consultant reference number	T01405				
Council	Goulburn Mulwaree	Assessing officer			
Nominated lot	1//853498	Associated lots	Lot	Section	Plan
Development class	Subdivision unsewered >=4 lots		2		835278
			1		835278
			1		731427
			22		811954
			23		811954
			24		811954
			3		835278
			1		779194
			103		70346
			104		126140
			105		126140
			1		853498
			106		126140

Date of model run

WEM Model Run Summary

Model run outcome **Pending**

Any of the sub-surface plumes reaches:

Lot boundary	N/A
Drainage depression	N/A
Top bank of watercourse	N/A
Another disposal field or onsite stormwater management system	N/A
Within 50m, and up gradient of, a licensed drinking water bore	N/A

Proposed Front End Design

Length (across slope)(m)	40.0	Width (up slope)(m)	20.0
Proposed area(m ²)	800.0	Minimum Required area (m ²)	730.0
Number of trenches	0		

WEM Summary

version 3

Effluent volume proposed (l/day)	800
Effluent volume calculated (l/day)	800

WEM Model Inputs

Location

Easting	9551027.485516	Northing	4326943.138470
Slope (m/m)	0.02561	Slope is suitable based on site inspection (Applicable to some disposal systems on steep slopes)	N/A

Development

Development type	Dwellings	Development detail	4 bedrooms
Water supply type	Rainwater	Spa Bath	No
Continuous system use	Yes		
Treatment system	AWTS standard	Disposal system	Irrigation sub-surface

Site

Lot size(m2)	4000		
Subject to severe frost	No	Bulk density(g/cm3)	1.60
Vegetation for nutrient uptake	Lawn - unmanaged	Phosphorus sorption (mg/kg)	400
Soil depth (to impermeable layer) (m)	1.00	Soil structure	High/moderate
Saturated hydraulic conductivity (Ksat)(m/day)	1.00		
Soil texture	Clay loams		

Effluent disposal risk factors

Depth to water table	0.4 - 1.0
Flood potential of disposal system	Above 1 in 50 year ARI
Landform score	Hill crests, convex side slopes and plains
Run-on and upslope seepage	None-low, diversion possible
Rock outcrops, scarp and bedrock	< 5%
Distance to drainage depression	> 50
Distance to watercourses and water supply reservoirs	> 120
Distance to licenced drinking water bores	> 150

WEM Plume Map

No image of the plumes is available. This may be because the model has not yet been run or because no image was generated when the model ran.

WEM Summary

version 3

General Information

WEM model ID	2335121	Associated DA number			
Model description	Concept effluent management				
Consultancy	Southern Region Land Engineering	Consultant	gregtodd.srle@gmail.com		
Consultant reference number	T01405				
Council	Goulburn Mulwaree	Assessing officer			
Nominated lot	1//853498	Associated lots	Lot	Section	Plan
Development class	Subdivision unsewered >=4 lots		2		835278
			1		835278
			1		731427
			22		811954
			23		811954
			24		811954
			3		835278
			1		779194
			103		70346
			104		126140
			105		126140
			1		853498
			106		126140

Date of model run

WEM Model Run Summary

Model run outcome **Pending**

Any of the sub-surface plumes reaches:

Lot boundary	N/A
Drainage depression	N/A
Top bank of watercourse	N/A
Another disposal field or onsite stormwater management system	N/A
Within 50m, and up gradient of, a licensed drinking water bore	N/A

Proposed Front End Design

Length (across slope)(m)	40.0	Width (up slope)(m)	20.0
Proposed area(m ²)	800.0	Minimum Required area (m ²)	730.0
Number of trenches	0		

WEM Summary

version 3

Effluent volume proposed (l/day)	800
Effluent volume calculated (l/day)	800

WEM Model Inputs

Location

Easting	9550647.406968	Northing	4327243.404693
Slope (m/m)	0.01281	Slope is suitable based on site inspection (Applicable to some disposal systems on steep slopes)	N/A

Development

Development type	Dwellings	Development detail	4 bedrooms
Water supply type	Rainwater	Spa Bath	No
Continuous system use	Yes		
Treatment system	AWTS standard	Disposal system	Irrigation sub-surface

Site

Lot size(m2)	4000		
Subject to severe frost	No	Bulk density(g/cm3)	1.60
Vegetation for nutrient uptake	Lawn - unmanaged	Phosphorus sorption (mg/kg)	590
Soil depth (to impermeable layer) (m)	1.00	Soil structure	Moderate
Saturated hydraulic conductivity (Ksat)(m/day)	1.00		
Soil texture	Light clays		

Effluent disposal risk factors

Depth to water table	0.4 - 1.0
Flood potential of disposal system	Above 1 in 50 year ARI
Landform score	Hill crests, convex side slopes and plains
Run-on and upslope seepage	None-low, diversion possible
Rock outcrops, scarp and bedrock	< 5%
Distance to drainage dpression	> 50
Distance to watercourses and water supply reservoirs	> 120
Distance to licenced drinking water bores	> 150

WEM Plume Map

No image of the plumes is available. This may be because the model has not yet been run or because no image was generated when the model ran.

WEM Summary

version 3

General Information

WEM model ID	2335122	Associated DA number			
Model description	Concept effluent management				
Consultancy	Southern Region Land Engineering	Consultant	gregtodd.srle@gmail.com		
Consultant reference number	T01405				
Council	Goulburn Mulwaree	Assessing officer			
Nominated lot	1//731427	Associated lots	Lot	Section	Plan
Development class	Subdivision unsewered >=4 lots		2		835278
			1		835278
			1		731427
			22		811954
			23		811954
			24		811954
			3		835278
			1		779194
			103		70346
			104		126140
			105		126140
			1		853498
			106		126140

Date of model run

WEM Model Run Summary

Model run outcome **Pending**

Any of the sub-surface plumes reaches:

Lot boundary	N/A
Drainage depression	N/A
Top bank of watercourse	N/A
Another disposal field or onsite stormwater management system	N/A
Within 50m, and up gradient of, a licensed drinking water bore	N/A

Proposed Front End Design

Length (across slope)(m)	30.0	Width (up slope)(m)	28.0
Proposed area(m ²)	840.0	Minimum Required area (m ²)	730.0
Number of trenches	0		

WEM Summary

version 3

Effluent volume proposed (l/day)	800
Effluent volume calculated (l/day)	800

WEM Model Inputs

Location

Easting	9552297.015593	Northing	4325911.594827
Slope (m/m)	0.01811	Slope is suitable based on site inspection (Applicable to some disposal systems on steep slopes)	N/A

Development

Development type	Dwellings	Development detail	4 bedrooms
Water supply type	Rainwater	Spa Bath	No
Continuous system use	Yes		
Treatment system	AWTS standard	Disposal system	Irrigation sub-surface

Site

Lot size(m2)	4000		
Subject to severe frost	No	Bulk density(g/cm3)	2.00
Vegetation for nutrient uptake	Lawn - unmanaged	Phosphorus sorption (mg/kg)	600
Soil depth (to impermeable layer) (m)	0.90	Soil structure	Weak/massive
Saturated hydraulic conductivity (Ksat)(m/day)	0.06		
Soil texture	Med-heavy clays		

Effluent disposal risk factors

Depth to water table	0.4 - 1.0
Flood potential of disposal system	Above 1 in 50 year ARI
Landform score	Hill crests, convex side slopes and plains
Run-on and upslope seepage	None-low, diversion possible
Rock outcrops, scarp and bedrock	< 5%
Distance to drainage depression	> 50
Distance to watercourses and water supply reservoirs	> 120
Distance to licenced drinking water bores	> 150

WEM Plume Map

No image of the plumes is available. This may be because the model has not yet been run or because no image was generated when the model ran.

WEM Summary

version 3

General Information

WEM model ID	2335124	Associated DA number			
Model description	Concept effluent management				
Consultancy	Southern Region Land Engineering	Consultant	gregtodd.srle@gmail.com		
Consultant reference number	T01405				
Council	Goulburn Mulwaree	Assessing officer			
Nominated lot	1//731427	Associated lots	Lot	Section	Plan
Development class	Subdivision unsewered >=4 lots		2		835278
			1		835278
			1		731427
			22		811954
			23		811954
			24		811954
			3		835278
			1		779194
			103		70346
			104		126140
			105		126140
			1		853498
			106		126140

Date of model run

WEM Model Run Summary

Model run outcome **Pending**

Any of the sub-surface plumes reaches:

Lot boundary	N/A
Drainage depression	N/A
Top bank of watercourse	N/A
Another disposal field or onsite stormwater management system	N/A
Within 50m, and up gradient of, a licensed drinking water bore	N/A

Proposed Front End Design

Length (across slope)(m)	40.0	Width (up slope)(m)	20.0
Proposed area(m ²)	800.0	Minimum Required area (m ²)	730.0
Number of trenches	0		

WEM Summary

version 3

Effluent volume proposed (l/day)	800
Effluent volume calculated (l/day)	800

WEM Model Inputs

Location

Easting	9551584.606226	Northing	4325773.369124
Slope (m/m)	0.02065	Slope is suitable based on site inspection (Applicable to some disposal systems on steep slopes)	N/A

Development

Development type	Dwellings	Development detail	4 bedrooms
Water supply type	Rainwater	Spa Bath	No
Continuous system use	Yes		
Treatment system	AWTS standard	Disposal system	Irrigation sub-surface

Site

Lot size(m2)	411741		
Subject to severe frost	No	Bulk density(g/cm3)	1.80
Vegetation for nutrient uptake	Lawn - unmanaged	Phosphorus sorption (mg/kg)	500
Soil depth (to impermeable layer) (m)	1.40	Soil structure	Moderate
Saturated hydraulic conductivity (Ksat)(m/day)	0.06		
Soil texture	Light clays		

Effluent disposal risk factors

Depth to water table	> 1.0
Flood potential of disposal system	Above 1 in 50 year ARI
Landform score	Hill crests, convex side slopes and plains
Run-on and upslope seepage	None-low, diversion possible
Rock outcrops, scarp and bedrock	< 5%
Distance to drainage depression	> 50
Distance to watercourses and water supply reservoirs	> 120
Distance to licenced drinking water bores	> 150

WEM Plume Map

No image of the plumes is available. This may be because the model has not yet been run or because no image was generated when the model ran.