

Attachment 2 Engineering Services Report



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



ACT Geotechnical Engineers Pty Ltd

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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 LotsMinimum. 2haRainfall Station070330 – Goulburn Airport AWS NSWEvaporation Station070263 – 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/cm³)	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 RESUL	TS
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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
Р3	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

C-11 T4	Borehole / Sample Depth						
Soil Test	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)		
рН	6.5	5.3	5.5	5.8	6.8		
Electrical Conductivity (µ\$/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		Bore	Required health-based investigation levels (HIL) (mg/kg)				
Comaminan	Α6	B4	C2	D2	D4	Residential	Residential
	(0.0m –	(0.0m –	(0.0m –	(0.0m –	(0.0m –	A ¹	B ²
	0.2m)	0.2m)	0.4m)	0.2m)	0.2m)		
OCPs	<0.1	<0.1	<0.1	<0.1	<0.1	<6 (i)	<10 ⁽ⁱ⁾
(mg/kg)	~0.1	\0.1	~0.1	\0.1	\0.1	\0 \0	~10 ¹⁰
OPPs	<0.1	<0.1 <0.1	<0.1	<0.1	<0.1	<6 ⁽ⁱ⁾	<10 ⁽ⁱ⁾
(mg/kg)	~0.1	\0.1	\0.1	\0.1	\0.1	\0 \0	~10 ¹⁰

Notes:

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 A\$1319 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

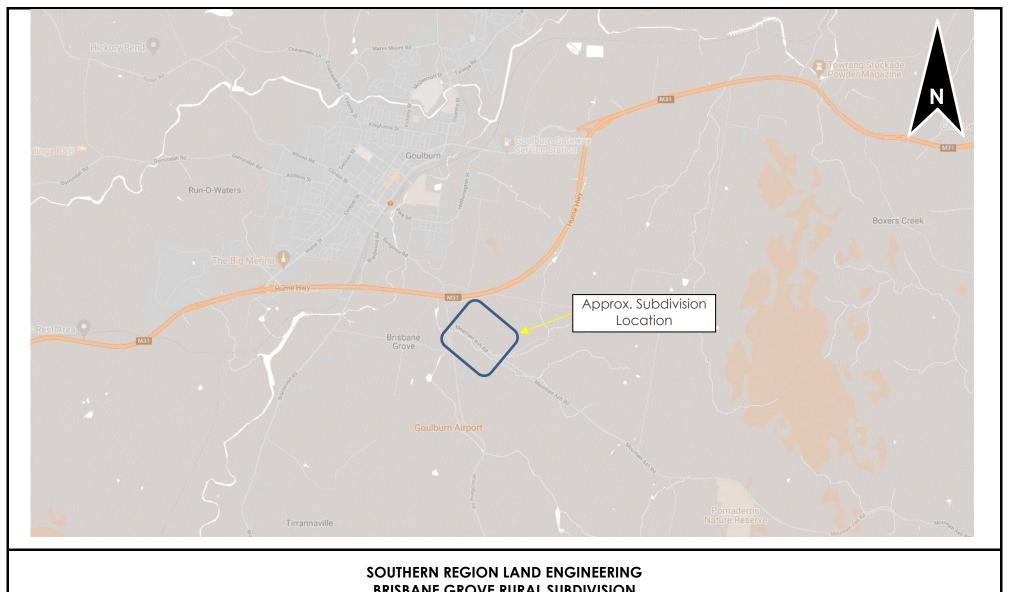
Senior Geotechnical Engineer

Attachments: Figures 1 to 3, Appendix A to D

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



BRISBANE GROVE RURAL SUBDIVISION SITE LOCALITY

ACT Geotechnical Engineers Pty Ltd C11822 FIGURE 1

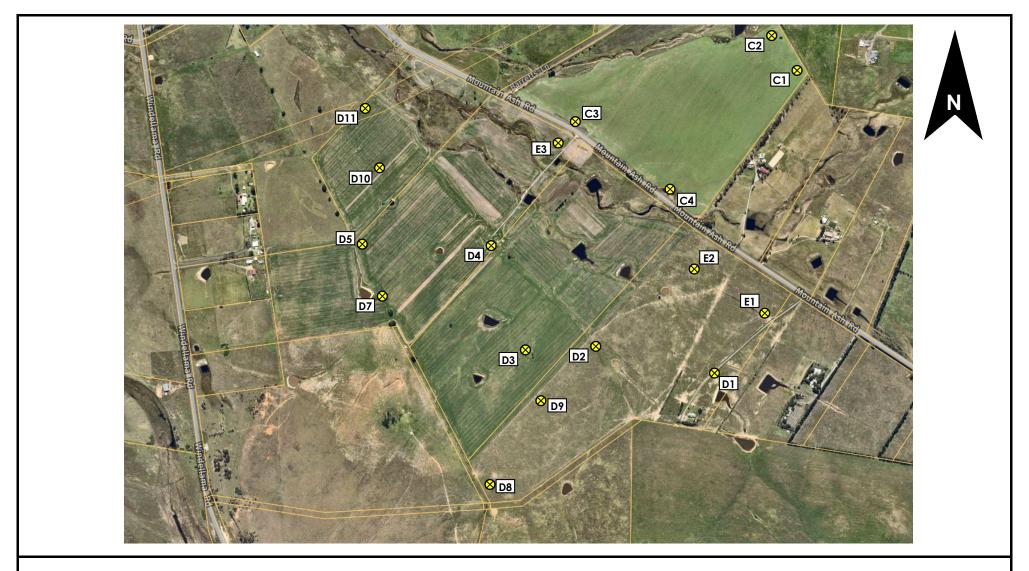


SOUTHERN REGION LAND ENGINEERING BRISBANE GROVE RURAL SUBDIVISION AERIAL PHOTOGRAPH AND BOREHOLE LOCATIONS

ACT Geotechnical Engineers Pty Ltd

C11822

FIGURE 2



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

ACT Geotechnical Engineers Pty Ltd C11822 FIGURE 3

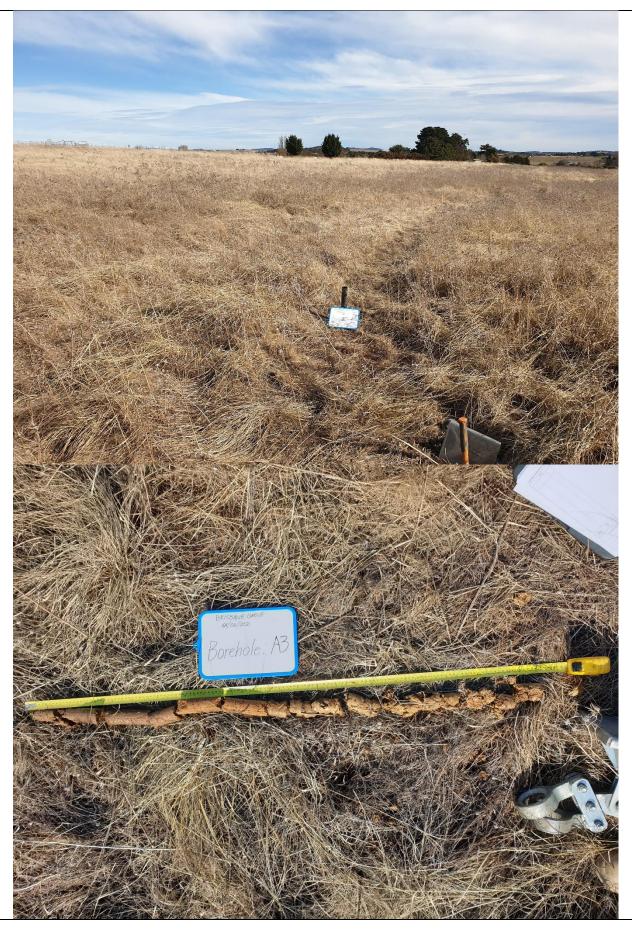
APPENDIX A
Location and Soil Core Photos



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)



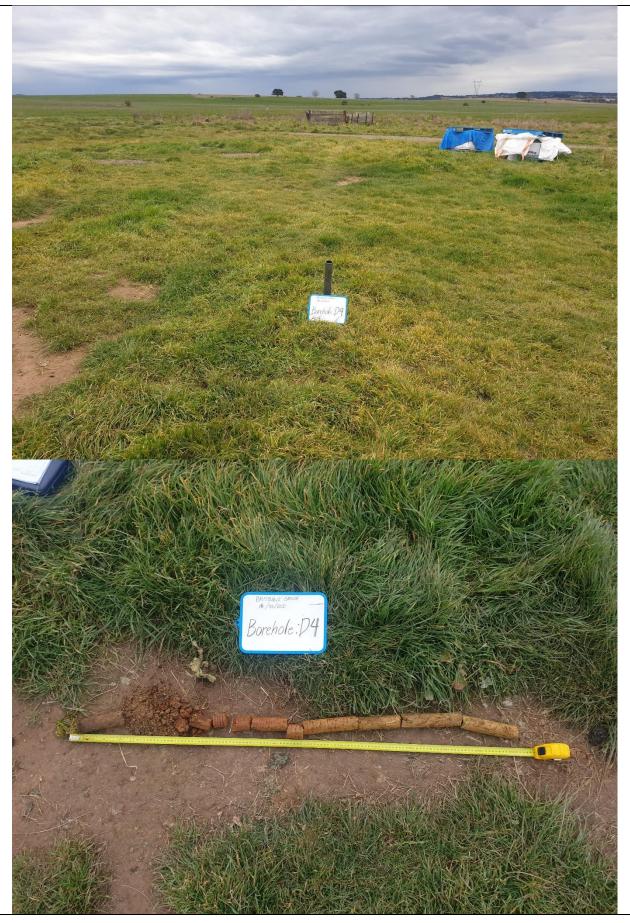
SOUTHERN REGION LAND ENGINEERING BRISBANE GROVE RURAL SUBDIVISION LOCATION AND SOIL CORE PHOTOS (D1)



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)



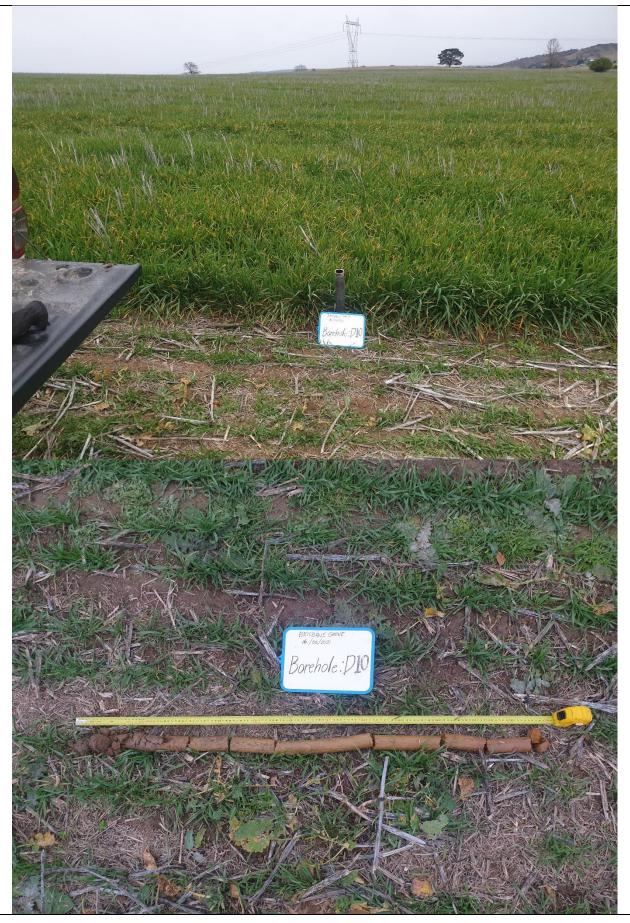
SOUTHERN REGION LAND ENGINEERING BRISBANE GROVE RURAL SUBDIVISION LOCATION AND SOIL CORE PHOTOS (D7)



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

Bor	eho	le L	og						AU1	
							Sheet	1 of 1		
CLI	ENT:	S	outh	ern I	Region Land Engineering		Job No	C118	322	
PR	OJEC				Grove Rural Subdivision t Road & Mountain Ash Roa	nd Goulburn NSW	Location : SEE REPORT			
Equip Hole	oment Ty Diamete	/pe : Pl er : 50n	USH TI			ia, Coalbairi, NOVV	Angle F	evel:Not Know From Vertical: 0° g:N.A.	n	
Samples	Casing	Debth Metres	Graphic Log	U.S.C.S.	Material Description, Struc Soil Type: Plasticity or Particle Characteris Colour, Secondary and Minor Components Moisture, Structure		Consistency or Relative Density	Field Test Results	Geological Profile	
		Wetres	12 12 12 12 12 12 12 12 12 12 12 12 12 1	SM	Silty SAND; fine to medium grained sand, low pla rootlets, moist.	asticity silt, brown, with grass	LOOSE		TOPSOIL	
		0.15	-	ML	Sandy SILT; low plasticity silt, fine to medium gragrey, moist.	ained sand, light brown, light	FIRM		SLOPEWASH -	
			-						_	
		-		СН	CLAY; medium to high plasticity clay, orange-gre	ey mottled, dry to moist.	STIFF TO VERY STIFF		RESIDUAL SOIL	
		0.8		СН	CLAY; high plasticity clay, orange-grey mottled, d	dry.	VERY STIFF		-	
		1.0 -							_	
									-	
		1.3			BOREHOLE TERMINATED	D AT 1.3m				
			-						-	
Lo	gged	<u>1.6</u> By :	KA	\ \	Date : 15/06/21	Checked By:	JM	Date :	17/06/21	

Bor	eho	le L	og		AUZ					
						Sheet	1 of 1			
CLI	ENT:	S	outh	ern F	Region Land Engineering	Job N	o. C118	822		
PR	OJEC				Grove Rural Subdivision Road & Mountain Ash Road, Goulburn, NS'		Location: SEE REPORT			
Equip Hole	oment Ty Diamete	ype : Per : 50n	USH TI			Angle	Level: Not Know From Vertical: 0 ng: N.A.			
Se	D	_	.ي	o,	Material Description, Structure	incy Y e	` Field			
Samples	Casing	Htd- O Metres	Graphic Log	U.S.C.	Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure	Consistency or Relative Density	Test Results	Geological Profile		
			1/. : xy.1/. : xy.	SM	Silty SAND; fine to medium grained sand, low plasticity silt, brown, with grass rootlets, moist.	LOOSE		TOPSOIL		
		0.1		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 -		
		0.3		CL	Sandy Gravelly CLAY; low to medium plasticity clay, fine to coarse sand, fine to medium grained sedimentary gravel, orange-brown, dry.	STIFF		-		
		0.6		SC	Sandy CLAY / Clayey SAND; fine to coarse sand, low to medium plasticity clay, yellow-brown, orange-brown, dry.	STIFF / MEDIUM DENSE		RESIDUAL SOIL		
								-		
		1.01-		СН	Sandy CLAY; medium to high plasticity clay, fine to coarse sand, yellow-brown mottled orange-brown, dry.	STIFF TO VERY STIFF		-		
		1.3	_		BOREHOLE TERMINATED AT 1.3m			-		
Lo	gged	1.6 By:	KA	\	Date: 15/06/21 Checked By:	JM	Date :	17/06/21		

Bor	eho	le L	og						AU3	
							Sheet	1 of 1		
CLI	ENT:	S	South	ern F	Region Land Engineering		Job No	C118	322	
PR	OJEC				Grove Rural Subdivision Road & Mountain Ash Roa	d, Goulburn, NSW	Location : SEE REPORT			
Equip Hole	ment Ty Diamete	/pe : P	USH TI				Angle I	Level: Not Know From Vertical: 0° g: N.A.		
Samples	Casing	Depth Metres	Graphic Log	U.S.C.S.	Material Description, Structure Soil Type: Plasticity or Particle Characterist Colour, Secondary and Minor Components Moisture, Structure	stics, s,	Consistency or Relative Density	Field Test Results	Geological Profile	
				SM	Silty SAND; fine to medium grained sand, low pla rootlets, moist.		LOOSE		TOPSOIL -	
		0.25	-	CL	Silty Sandy CLAY; low to medium plasticity fines orange-brown, moist.	, fine to medium grained sand,	FIRM TO STIFF		ALLUVIUM -	
		0.5_		CL-CH	Sandy CLAY; medium plasticity clay, fine to coar wet.	se sand, light brown, moist to	FIRM TO STIFF		-	
		1.0 -		CH	Sandy CLAY; medium to high plasticity clay, fine	to coarse sand, fine gravel and	VERY STIFF		- -	
		1.4			ferruginous nodules, light brown, brown, dry. BOREHOLE TERMINATE		SHIFF		-	
		1.6			DONERULE TERMINATEL	Z G1 1.4111			_	
Lo	gged		KA	λ	Date : 01/06/21	Checked By:	JM	Date :	17/06/21	



Ror	ehe	ole L	Oa				Borehole	e No.	A04
	CII		.og				Sheet	1 of 1	
CLI	IENT	: S	South	ern I	Region Land Engineering		Job No.	C118	322
PR	OJE				Grove Rural Subdivision Road & Mountain Ash Roa	ad Goulburn NSW	,	: SEE REPOR	
Equip Hole	oment Diame	Type: F ter: 50i	USH TU			id, Godibarri, 14044		evel:Not Know rom Vertical: 0° :N.A.	n
Samples	paigo	Depth	Graphic Log	U.S.C.S.	Material Description, Structure Soil Type: Plasticity or Particle Character Colour, Secondary and Minor Componen		Consistency or Relative Density	Field Test Results	Geological Profile
		Metres	7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	SM	Moisture, Structure Silty SAND; fine to medium grained sand, low prootlets, moist.	lasticity silt, brown, with grass	LOOSE		TOPSOIL
		0.3		CL	Silty CLAY; low to medium plasticity clay, some yellow-brown, light brown, trace fine gravel and to moist.	fine to medium grained sand, ferruginous nodules to 5mm, dry	STIFF		ALLUVIUM -
		0.8		SC	Clayey Gravelly SAND; fine to coarse sand, fine gravel, low plasticity clay, red-brown, brown, dry	to medium grained sedimentary	MEDIUM DENSE TO DENSE		RESIDUAL SOIL
		1.0-							-
		1.4	<i> </i>		BOREHOLE TERMINATE	D AT 1.4m			
									_
Lc	ogge	1.6 d By :	KA	\	Date : 15/06/21	Checked By:	JM	Date :	17/06/21



Bor	eho	le L	og				Sheet		AUS	
							Job No	1 of 1		
CLI	ENT:	S	outh	ern F	Region Land Engineering		C11822			
PR	OJEC				Grove Rural Subdivision Road & Mountain Ash Road, Goulb	urn, NSW		on: SEE REPORT		
Equip Hole	oment T Diamet	ype : Pl er : 50n	USH TU	JBE DI	RILL		Angle F	From Vertical : 0° g : N.A.		
Samples	Casing	Depth Metres	Graphic Log	U.S.C.S.	Material Description, Structure Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure	50	Consistency or Relative Density	Field Test Results	Geological Profile	
		Metres	70.7 7.77.7	SM	Silty SAND; fine to medium grained sand, low plasticity silt, brown rootlets, moist.		LOOSE		TOPSOIL	
			2. 3.2. 2. 3.2. 2. 3.2. 3.2. 3.						-	
		0.3	12 3.5	CL	Silty Sandy CLAY; low plasticity fines, fine to medium grained sar moist.		FIRM TO STIFF		ALLUVIUM	
		_							-	
		0.6								
				SC	Clayey Gravelly SAND; fine to coarse sand, fine gravel and ferrugi low plasticity clay, orange-brown, some grey, dry.	!	MEDIUM DENSE TO DENSE		RESIDUAL SOIL	
		4.0							-	
		1.0 -							-	
									-	
		1.3	<u> </u>		BOREHOLE TERMINATED AT 1.3m					
			-						-	
		-	_						-	
Lc	gged	1.6 By:	KA	M	Date :	17/06/21				



Bor	ehe	ole L	og						A06		
							Sheet	1 of ′	I		
CLI	IENT	: S	South	ern F	Region Land Engineering		Job No.	C11	822		
PR	OJE				Grove Rural Subdivision Road & Mountain Ash Road, Goulburn, N	SW	Location: SEE REPORT				
Equip Hole	oment Diame	Type: P	USH TI			<u> </u>	Angle F	evel:Not Knov rom Vertical: 0 ı:N.A.			
es	,	<u> </u>	ы́ _	ω <u>΄</u>	Material Description, Structure	ency	ig ve	Field			
Samples		Metres	Graphic Log	U.S.C.	Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure	Consistency	or Relative Density	Test Results	Geological Profile		
			76.77 77.74 77.74	SM	Silty SAND; fine to medium grained sand, low plasticity silt, brown, with grass rootlets, moist.	s LO	OOSE		TOPSOIL		
		0.2	 	ML	Sandy SILT; low plasticity silt, fine to medium grained sand, light brown, mois	st. FI	RM		ALLUVIUM		
		0.4									
		_		CL	Silty Gravelly CLAY; low to medium plasticity fines, fine to medium grained sedimentary gravel, light brown, some red-brown, moist.	S	TIFF		-		
		0.6									
		0.0		СН	Sandy CLAY; medium to high plasticity clay, fine to medium grained sand, lig brown, moist.	ght S	TIFF TO ERY TIFF		RESIDUAL SOIL		
									-		
		0.9		SC	Clayey Gravelly SAND; fine to coarse sand, fine to medium grained gravel an	u D	ENSE		_		
		1.0-			ferruginous nodules, low to medium plasticity clay, light brown, orange-brown dry to moist.						
				- Co							
		1.4	// 9/	1	BOREHOLE TERMINATED AT 1.4m						
		1.6									
Lc	gge	d By:	KA	4	Date: 15/06/21 Checked By	: JI	M	Date :	17/06/21		

Bor	eho	le L	og			AU/			
						Sheet	1 of 1		
CLI	IENT:	S	outh	ern f	Region Land Engineering	Job No	C11	822	
PR	OJEC				Grove Rural Subdivision Road & Mountain Ash Road, Goulburn, NSW	Location : SEE REPORT Collar Level : Not Known			
Equip Hole	oment Ty Diamete	ype : P	USH TI			Angle F	From Vertical: 0 g: N.A.		
Samples	Casing	thde O Metres	Graphic Log	U.S.C.S.	Material Description, Structure Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure	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 -	
		0.25	-	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	
		-			BOREHOLE TERMINATED AT 1.4m			_	
Lc	ogged	1.6 By:	KA	\ \	Date: 15/06/21 Checked By:	JM	Date :	17/06/21	



Bor	αh	اما	اما	oa			Borehole No. A08			
DOI	GII	101	C L	og				Sheet	1 of 1	
CLI	IEN	IT:	S	outh	ern f	Region Land Engineering		Job No	C118	322
PR	OJI	EC				Grove Rural Subdivision Road & Mountain Ash Roa	d. Goulburn. NSW	,	n : SEE REPOR	
Equip Hole	omen Diam	nt Ty		USH TL			<u>a, coalibarri, recri</u>	Angle F	evel:Not Know From Vertical: 0° g: N.A.	
Samples		Casing	Depth	Graphic Log	U.S.C.S.	Material Description, Struc Soil Type: Plasticity or Particle Characteris Colour, Secondary and Minor Components Moisture, Structure	stics,	Consistency or Relative Density	Field Test Results	Geological Profile
			Metres	\(\frac{1}{2}\)\cdot \(1	SM	Silty SAND; fine to medium grained sand, low pla rootlets, moist.	asticity silt, brown, with grass	LOOSE		TOPSOIL
			0.15		CL	Sandy Silty CLAY; low to medium plasticity fines, red-brown, dry.	fine to medium grained sand,	FIRM		ALLUVIUM -
			0.7		CL	Sandy CLAY; low to medium plasticity clay, fine t	o coarse sand vellow brown	STIFF		- RESIDUAL SOIL
						mottled orange-brown, dry.	s source saile, John John			-
			1.0 -							
			1.4			BOREHOLE TERMINATED	O AT 1.4m			_
	oaa	ed	1.6 Bv :	KA	•	Date : 15/06/21	Checked By:	 JM	Date :	17/06/21



Bor	eho	le L	og				Sheet		AUS
							Jah Na	1 of 1	
CLI	ENT	S	outh	ern f	Region Land Engineering		Job No	C118	322
PR	OJE				Grove Rural Subdivision Road & Mountain Ash Road, Gou	lburn, NSW		n : SEE REPOR Level : Not Knowr	
Equip Hole	oment T Diamet	ype : P er : 50n	USH TU	JBE DI	RILL		Angle f Bearing	From Vertical : 0° g : N.A.	
Samples	Casing	Depth Metres	Graphic Log	U.S.C.S.	Material Description, Structure Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure		Consistency or Relative Density	Field Test Results	Geological Profile
			17 3 17 17 3 17 18 18 18	SM	Silty SAND; fine to medium grained sand, low plasticity silt, be rootlets, moist.	rown, with grass	LOOSE		TOPSOIL -
		0.2	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	SM	Silty Gravelly SAND; fine to coarse sand, low plasticity silt, fin	e gravel and	LOOSE		ALLUVIUM
					ferruginous nodules, grey, dry.		TO MEDIUM DENSE		-
		-							-
									-
		0.8		CL	Silty Gravelly CLAY; low plasticity fines, fine gravel and ferrugi grey/black, dry.	inous nodules,	STIFF		RESIDUAL SOIL
		1.0 -							-
		1.2		CL-CH	Sandy CLAY; fine to medium grained sand, medium plasticity	clay orange-grey	VERY		-
		1.2			mottled, dry.	ciay, crange-grey	STIFF		
		1.3			BOREHOLE TERMINATED AT 1.3m				-
		-	-						_
Lc	gged	1.6 By:	KA	\	Date : 15/06/21 Chec	cked By: .	JM	Date :	17/06/21



Bor	ehe	ole	, Lo	og						A10
								Sheet	1 of 1	
CLI	IEN	Γ:	S	outh	ern I	Region Land Engineering		Job N	o. C118	322
PR	OJE	CT				Grove Rural Subdivision t Road & Mountain Ash Roa	ad, Goulburn, NSW		on: SEE REPOR	
Equip Hole	oment Diame	Type eter		USH TL				Angle	From Vertical: 0°ng: N.A.	
Samples		- 1	Depth letres	Graphic Log	U.S.C.S.	Material Description, Structure Soil Type: Plasticity or Particle Character Colour, Secondary and Minor Component Moisture, Structure	icture ristics, nts,	Consistency or Relative Density	Field Test Results	Geological Profile
			_	1/2 · 3/4 ·	SM	Silty SAND; fine to medium grained sand, low prootlets, moist.		LOOSE		TOPSOIL
			0.2		CL	Sandy Silty CLAY; low plasticity fines, fine to moist to wet.	edium grained sand, light brown,	FIRM		ALLUVIUM -
			0.7		CL-CH	Sandy CLAY; medium plasticity clay, fine to me ferruginous nodules to 5mm, orange-grey mottle		STIFF	_	RESIDUAL SOIL
			1.01		SC	Clayey Gravelly SAND; fine to coarse sand, low gravel and quartz, orange-grey, dry.	/ plasticity clay, fine to coarse	DENSE		_
			1.2							
			-	:		BOREHOLE TERMINATE refusal	ED AT 1.2m			_
Lc	gge	<u> </u>	1.6 By :	KA	<u> </u>	Date : 15/06/21	Checked By:	JM	Date :	17/06/21

	Sheet 1 of 1
CLIENT: Southern Region Land Engineering	Job No. C11822
PROJECT Rosemont Road & Mountain Ash Road Goulburn NSW	Location: SEE REPORT Collar Level: Not Known
Emiliare and Time at PURCLETURE DRIVE	Angle From Vertical : 0° Bearing : N.A.
Seld Borner Born	e stit Ceological Geological Profile
SM Silty SAND; fine to medium grained sand, low plasticity silt, dark brown, with grass rootlets, moist.	OSE TOPSOIL
Clayey Gravelly SAND; fine to coarse sand, low plasticity clay, fine to medium grained sedimentary gravel, brown, red-brown, moist. MED DEN	COLLUVIUM
CL Sandy CLAY; low to medium plasticity clay, fine to coarse sand, brown, dry. STIF VER STIF	RESIDUAL SOIL PRESIDUAL SOIL -
Extremely Weathered (EW) SANDSTONE; fine to medium grained, light brown, WEAT WEAT	REMELY AK
BOREHOLE TERMINATED AT 1.1m refusal	-
Logged By: KA Date: 15/06/21 Checked By: JM	Date : 17/06/21



Bor	eh.	റിമ	1 4	na	Boreho	le No.	B02			
DOI	OII.			J				Sheet	1 of 1	
CLI	EN	Γ:	S	outh	ern F	Region Land Engineering		Job No	C118	322
PR	OJE	:CT				Grove Rural Subdivision Road & Mountain Ash Roa	nd Goulburn NSW		n : SEE REPOR	
Equip Hole	ment Diam	Type :	Pl	JSH TL			a, Coalcarri, Novv	Angle F	evel:Not Knowi From Vertical: 0° g: N.A.	n
Samples		Casing		Graphic Log	U.S.C.S.	Material Description, Structure Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure			Field Test Results	Geological Profile
		Met	res -	7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	SM	Silty SAND; fine to medium grained sand, low plane rootlets, moist.		LOOSE		TOPSOIL
			0.2 -		CL	Silty Sandy CLAY; low plasticity fines, fine sand,	light brown, moist.	FIRM		ALLUVIUM -
			-		CL	Sandy CLAY; low to medium plasticity clay, fine and ferruginous nodules, red-brown, light brown,	to coarse sand, trace fine gravel some orange, dry to moist.	STIFF		-
			- 0.							
	dae	1	.6	KA		BOREHOLE TERMINATE	Checked By:	IM	Date :	17/06/21



Ror	eho	le L	oa				Borehol	e No.	B03
D ()	CIIO		J				Sheet	1 of 1	
CLI	ENT:	S	outh	ern F	Region Land Engineering		Job No.	C118	322
PR	OJEC				Grove Rural Subdivision Road & Mountain Ash Road	, Goulburn, NSW		evel: Not Known	
Equip Hole	oment T	ype : Pi er : 50m	USH TU	JBE DI	RILL		Angle F Bearing	rom Vertical: 0°	'
Samples	Casing		Graphic Log	U.S.C.S.	Material Description, Structu Soil Type: Plasticity or Particle Characteristic Colour, Secondary and Minor Components, Moisture, Structure		Consistency or Relative Density	Field Test Results	Geological Profile
		Metres	12 3 14 3 1 12 3 14 1 14 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	SM	Silty SAND; fine to medium grained sand, low plasti rootlets, moist.	city silt, brown, with grass	LOOSE		TOPSOIL
		0.2		CL	Silty Sandy CLAY; low plasticity fines, fine to mediun moist to wet.	m grained sand, light brown,	SOFT TO FIRM		ALLUVIUM
		0.6		СН	Sandy CLAY; medium to high plasticity clay, fine to dry.	coarse sand, orange-brown,	STIFF TO VERY STIFF		-
		0.8		CL-CH	Sandy CLAY: medium plasticity clay, fine to coarse brown, dry.	sand, orange-brown, light	VERY STIFF TO HARD		-
		1.0 -							- -
		1.2			BOREHOLE TERMINATED A very slow progress	T 1.2m			-
Lc	ogged	1.6 By:	KA	\ .	Date : 01/06/21	Checked By:	JM	Date :	17/06/21



Bor	·ok	20	le L	20				В	Borehol	e No.	B04
DOI	Gi	10	ic L	og				S	Sheet	1 of 1	
CL	IEN	NT:	S	outh	ern F	Region Land Engineering		J	ob No.	C118	322
PR	OJ	EC				Grove Rural Subdivision Road & Mountain Ash Ro	ad Goulburn NSW			n : SEE REPOR	
Equi Hole	pme Diar	nt Ty mete	/pe : Pl r : 50m	JSH TU			aa, coalban, non	Α	ngle F	evel:Not Knowi rom Vertical: 0° :N.A.	
Samples		Casing	Debth Metres	Graphic Log	U.S.C.S.	Material Description, Stru Soil Type: Plasticity or Particle Characte Colour, Secondary and Minor Componer Moisture, Structure	cture ristics, nts,	Consistency or	Relative Density	Field Test Results	Geological Profile
			Wich Co	70.7 70.7 7.77	SM	Silty SAND; fine to medium grained sand, low prooflets, moist.		LOOS	SE		TOPSOIL -
			0.2 .		SC-SM	Silty Clayey SAND; fine to medium grained san dry to moist.	id, low plasticity silt, light brown,	LOOS	SE		SLOPEWASH
			- -		CL	Sandy Gravelly CLAY; low to medium plasticity gravel and ferruginous nodules, light grey, mois	clay, fine sand, fine grained it.	FIRM	=		ALLUVIUM
			1.0 —		CL-CH	Sandy CLAY; medium plasticity clay, fine to me mottled, some red-brown, dry.		STIFF VERY STIFF	Y		<u>-</u>
			_			BOREHOLE TERMINATI	ED AT 1.4m				_
Lc	ogg	jed	1.6 By :	KA	\ \	Date : 01/06/21	Checked By:	JM		Date :	17/06/21

Bor	ehc	ole L	og						CUI
							Sheet	1 of 1	
CLI	ENT	: S	South	ern F	Region Land Engineering		Job No	C118	
PR	OJE				Grove Rural Subdivision : Road & Mountain Ash Road, Go	oulburn, NSW	Collar	on: SEE REPOR' Level: Not Known	n
Equip Hole	oment ⁻ Diame	Гуре : P ter : 50n	USH TU	JBE DI	RILL		Bearing	From Vertical : 0° g : N.A.	
Samples	Casing	Debth Metres	Graphic Log	U.S.C.S.	Material Description, Structure Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure		Consistency or Relative Density	Field Test Results	Geological Profile
			12 14 14 14 14 14 14 14 14 14 14 14 14 14	SM	Silty SAND; fine to medium grained sand, low plasticity sil rootlets, moist.		LOOSE		TOPSOIL
		0.2		SM	Silty Gravelly SAND; fine to coarse sand, low plasticity silt, grained sedimentary gravel, grey/brown, dry to moist.	, fine to medium	MEDIUM DENSE		ALLUVIUM
		0.5		СН	Sandy CLAY; medium to high plasticity clay, fine to coarse mottled red-brown, dry.	e sand, yellow-brown	VERY STIFF		RESIDUAL SOIL
		0.0_		SC	Clayey Gravelly SAND; fine to coarse sand, low to medium medium grained sedimentary gravel, yellow-brown, dry.	n plasticity clay, fine to	DENSE		-
		0.9	::/:::/::		BOREHOLE TERMINATED AT 0.9m refusal	n			
		1.0 -	-						- - -
			-						-
		1.6	-						-
Lc	gge	d By :	K/		Date: 16/06/21 Ch	ecked By:	JM	Date :	17/06/21

								Boreho	ole No.	
	Bor	eho	le L	.og						C02
_								Sheet	1 of 1	
	CLI	IENT:	: 5	South	ern F	Region Land Engineering		Job No	C118	322
	PR	OJEC				Grove Rural Subdivision Road & Mountain Ash Road	d, Goulburn, NSW	,	on: SEE REPOR Level: Not Know	
	Equip Hole	oment T Diamete	ype : P er : 50r	USH TU	JBE DI	RILL		Angle I	From Vertical : 0° g : N.A.	
İ	es	D	ے	<u>.</u> 2	S.	Material Description, Struct	ure	ency /e ty	Field	
	Samples	Casing	Debtt Metres	Graphic Log	U.S.C.	Soil Type: Plasticity or Particle Characteristi Colour, Secondary and Minor Components, Moisture, Structure	ics,	Consistency or Relative Density	Test Results	Geological Profile
				17 . 34.17	SM	Silty SAND; fine to medium grained sand, low plas rootlets, moist.	sticity silt, brown, with grass	LOOSE		TOPSOIL
				7. 7.7.						
			0.15	0.00	SM	Silty Gravelly SAND; fine to coarse sand, fine grave low plasticity silt, grey, moist.	el and ferruginous nodules,	LOOSE TO		ALLUVIUM
				0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.				MEDIUM DENSE		
			0.3		СН	Sandy CLAY; medium to high plasticity clay, fine to	o coarse sand, light brown,	STIFF TO		RESIDUAL SOIL
						some orange-brown, dry to moist.		VERY STIFF		
										-
			0.85							
					СН	Sandy CLAY; high plasticity clay, fine to coarse sa 20mm, light brown, dry to moist.	nd, trace sedimentary gravel to	VERY STIFF TO HARD		
			1.0							-
7/21										
T 04/07										
3EO.GD										
J ACT			1.3							
1822.GF						BOREHOLE TERMINATED	A1 1.3m			
.0G C1				-						
ATION L										
/EXCAV,										
BOREHOLE/EXCAVATION LOG C11822.GPJ ACT GEO.GDT 04/07/21	Lo	gged	<u> </u>	KA	\ \	Date : 16/06/21	Checked By:	JM	Date :	17/06/21

Bor	eho	ole L	og					C03
						Sheet	1 of 1	
CL	IENT	: S	South	ern F	Region Land Engineering	Job No	C118	322
PR	OJE				Grove Rural Subdivision : Road & Mountain Ash Road, Goulburn, NSW		n : SEE REPOR	T
Equi _l Hole	pment Diame	Гуре : Р ter : 50r	USH T			Angle F	_evel: Not Know From Vertical: 0 g: N.A.	
Se		, ,	.ల	o,	Material Description, Structure	incy 'e ty	Field	
Samples	pasion	Htde O Metres	Graphic Log	U.S.C.	Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure	Consistency or Relative Density	Test Results	Geological Profile
		Wietree	1	SM	Silty SAND; fine to medium grained sand, low plasticity silt, brown, with grass rootlets, moist.	LOOSE		TOPSOIL
			<u>\id</u> . \id \ti_2.					-
		0.2	· <u>''</u> · <u>''</u>					
		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
			- 2 6 6					-
		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		СН	Sandy CLAY; medium to high plasticity clay, fine to coarse sand, grey-orange	VERY STIFF		RESIDUAL SOIL
					mottled, dry.	STIFF		
								-
								_
		1.4						
					BOREHOLE TERMINATED AT 1.4m			
		-	_					-
		1.6	17.		D-4- 40/00/04 01 1 1 5	10.4		47/00/04
Lc	ogge	d By:	KΑ	١.	Date: 16/06/21 Checked By:	JM	Date :	17/06/21

Bor	oh	٦I	0 I 4	~ ~						Boreho	le No.	C04
БОІ	GH	ΟI	e L	og						Sheet	1 of 1	
CLI	IEN	Γ:	S	outl	he	rn l	Region Land Engineering			Job No	C118	322
PR	OJE	C					Grove Rural Subdivision t Road & Mountain Ash Road,	Coulburn NSW		Locatio	on : SEE REPOR	Т
Equip Hole	oment Diame	Typeter	pe : Pl	USH 1				, Godibuiti, NSW		Angle F	Level: Not Knowr From Vertical: 0° g: N.A.	
Samples		Casing	Depth Metres	Graphic	J.	U.S.C.S.	Material Description, Structu Soil Type: Plasticity or Particle Characteristic: Colour, Secondary and Minor Components, Moisture, Structure	re s,	Consistency	or Relative Density	Field Test Results	Geological Profile
			<u>Metres</u>		7	SM	Silty SAND; fine to medium grained sand, low plastic rootlets, moist.			OOSE		TOPSOIL -
			0.3	-	÷.	ML	Clayey Sandy SILT; low to medium plasticity fines, fi fine gravel and ferruginous nodules, light brown, moi		FIF	₹M		ALLUVIUM -
			0.6			СН	Silty CLAY; medium to high plasticity fines, orange-ç	grey mottled, dry to moist.	VE ST	ERY IFF		RESIDUAL SOIL
			1.0 –									- - -
			1.3				BOREHOLE TERMINATED A	T 1 3m				-
							DOKEROLE TERMINATED A	1.3[[]				
			•									-
			-	-								_
Lc	gge	d	1.6 By:	K	 A		Date : 16/06/21	Checked By:	JN	<u> </u>	Date :	17/06/21

Bor	ehc	ole L	og						וטטו
							Sheet	1 of 1	
CLI	ENT	: S	outh	ern F	Region Land Engineering		Job No	C118	322
PR	OJE				Grove Rural Subdivision t Road & Mountain Ash Road, Gou	lburn, NSW		on: SEE REPOR Level: Not Know	
Equip Hole	oment T Diamet	Гуре : Р ter : 50n	USH TU	UBE DI	RILL		Angle f Bearing	From Vertical : 0° g : N.A.	
Samples	Casing	Debtty Metres	Graphic Log	U.S.C.S.	Material Description, Structure Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure		Consistency or Relative Density	Field Test Results	Geological Profile
			1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2	SM	Silty SAND; fine to medium grained sand, low plasticity silt, br rootlets, moist.		LOOSE		TOPSOIL
		0.2	-	ML	Clayey Sandy SILT; low plasticity fines, fine to medium grained moist to wet.	d sand, brown,	FIRM		ALLUVIUM -
		0.5_		CL	Silty Gravelly CLAY; low to medium plasticity fines, fine gravel nodules, light brown, moist.	l and ferruginous	FIRM TO STIFF		-
		1.0 -		СН	Sandy CLAY; medium to high plasticity clay, fine to medium g orange-brown, orange-grey, dry to moist.	rained sand,	VERY STIFF		RESIDUAL SOIL
		1.3							_
					BOREHOLE TERMINATED AT 1.3m				
		1.6							
Lc	gge	d By:	KA	4	Date : 17/06/21 Chec	cked By:	JM	Date :	17/06/21

CLIENT: Southern Region Land Engineering PROJECT Brisbane Grove Rural Subdivision Rosemont Road & Mountain Ash Road, Goulburn, NSW Equipment Type: PUSH TUBE DRILL Hobo Damator: Some Material Description, Structure Equipment Type: PUSH TUBE DRILL Hobo Damator: Some Material Description, Structure Equipment Type: PUSH TUBE DRILL Hobo Damator: Some Material Description, Structure Equipment Type: PUSH TUBE DRILL Hobo Damator: Some Material Description, Structure Equipment Type: PUSH TUBE DRILL Hobo Damator: Some Material Description, Structure Equipment Type: PUSH TUBE DRILL Hobo Damator: Some Material Description, Structure Equipment Type: PUSH TUBE DRILL Hobo Damator: Some Material Description Profiles Characteristics Calables Secretary and force Companies Calables Secretary and force Companies Results Description Total Total Total Total Total Total Total Total Total Total To	Bor	eho	le L	og						D02
PROJECT Brisbane Grove Rural Subdivision Rosemont Road & Mountain Ash Road, Goulburn, NSW Equipment Type: PUSH TUBE DRILL Hole Diameter: 50mm Material Description, Structure Sold Type: Plasticity or Particle Characteristics, Couls: Secondary and Miner Components Books, Soldies Metres Sold Type: Plasticity or Particle Characteristics, Couls: Soldies Miner Components Books, Soldies Sold Silly SAND: the to medium grained sand, low plasticity silt, brown, with gress COSE TOPSOL ALLUVEIM ALLUVEIM RESIDUAL SOIL RESIDUAL SOIL RESIDUAL SOIL								Sheet	1 of 1	
Results Rosemont Road & Mountain Ash Road, Goulburn, NSW Collar Level: Not Known Angle From Vertical: 0 Petrics: Somm Material Description, Structure Set Type Pestifys or Preticite Chrasterisedics, Colous Secondary and Minor Components. Moletare Structure Set Type Pestifys or Preticite Chrasterisedics, Colous Secondary and Minor Components. Moletare Structure Set Type Pestifys or Preticite Chrasterisedics, Colous Secondary and Minor Components. Moletare Structure Set Type Pestifys or Preticite Chrasterisedics, Colous Secondary and Minor Components. Moletare Structure Set Type Pestifys or Preticite Chrasterisedics, Colous Secondary and Minor Components. Moletare Structure Set Type Pestifys or Preticite Chrasterisedics, Colous Secondary and Minor Components. Moletare Structure Set Type Pestifys or Preticite Chrasterisedics, Colous Secondary and Minor Components. Moletare Structure Toels Results CLI	IENT:	S	South	ern F	Region Land Engineering		Job No	C118	322	
Equipment Type: PUSH TUBE DRILL Hole Diameter: 50mm Page Push Tube Push Tube Push Tube Push Dearing N.A.	PR	OJEC					, Goulburn, NSW			
1.00SE SM Silty SAND: fine to medium grained sand, low plasticity silt, brown, with grass rockies, moist. SM Silty Gravelly SAND: fine to medium grained sand, low plasticity silt, fine gravel and fernegrious rockies, light brown, most. CH Sandy CLAY: medium to high plasticity clay, fine to coarse sand, some fine gravel and ferruginous noclules, orange-gray motified, dry to moist. RESIDUAL SOIL	Equip Hole	oment Ty Diamete	ype : P	USH TU			,	Angle F	From Vertical: 0°	
1.00SE SM Silty SAND: fine to medium grained sand, low plasticity silt, brown, with grass rockies, moist. SM Silty Gravelly SAND: fine to medium grained sand, low plasticity silt, fine gravel and fernegrious rockies, light brown, most. CH Sandy CLAY: medium to high plasticity clay, fine to coarse sand, some fine gravel and ferruginous noclules, orange-gray motified, dry to moist. RESIDUAL SOIL	Samples	Casing		Graphic Log	C.	Soil Type: Plasticity or Particle Characteristic Colour, Secondary and Minor Components,	ure es,	Consistency or Relative Density	Test	Geological Profile
SIM Silty Gravelly SAND: fine to medium grained sand, low plasticity silt, fine gravel and ferruginous nodules, light brown, moist. CH Sandy CLAY; medium to high plasticity clay, fine to coarse sand, some fine gravel and ferruginous nodules, orange-grey motified, dry to moist. RESIDUAL SOIL					SM					TOPSOIL
Sandy CLAY; medium to high plasticity clay, fine to coarse sand, some fine gravel and ferruginous nodules, orange-grey mottled, dry to moist. 1.0 1.3			0.2		SM	Silty Gravelly SAND; fine to medium grained sand, land ferruginous nodules, light brown, moist.	low plasticity silt, fine gravel	LOOSE		ALLUVIUM - -
			0.7		СН	Sandy CLAY; medium to high plasticity clay, fine to gravel and ferruginous nodules, orange-grey mottled	coarse sand, some fine d, dry to moist.	VERY STIFF		RESIDUAL SOIL
			1.0 -							- - -
			1.3			BOREHOLE TERMINATED A	AT 1.3m			-
Logged By: KA Date: 17/06/21 Checked By: JM Date: 17/06/21		naged		<u> </u>		Date : 17/06/21	Checked By :	IM	Nate :	17/06/21



Ror	ohe	ا ماد	00				Boreho	le No.	D03
БОІ	GIK	ole L	og				Sheet	1 of 1	
CLI	IENT	: S	South	ern F	Region Land Engineering		Job No	. C118	322
PR	OJE				Grove Rural Subdivision Road & Mountain Ash Road, Gou	lhurn NSW		n : SEE REPOR	
Equip Hole	oment Diame	Type: P ter: 50r	USH TU			,	Angle I	_evel: Not Knowr From Vertical: 0° g: N.A.	1
Samples	20100	Depth	Graphic Log	U.S.C.S.	Material Description, Structure Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components,		Oursistericy or Relative Density	Field Test Results	Geological Profile
Ø		Metres	1/ · ½· · ½·	SM	Moisture, Structure Silty SAND; fine to medium grained sand, low plasticity silt, br rootlets, moist.		LOOSE	rtesuits	TOPSOIL
		0.15	1/2 × 1/2	СН			STIFF TO		RESIDUAL SOIL
				On	Sandy CLAY; medium to high plasticity clay, fine to coarse sar to moist.	na, rea-prown, ary	VERY STIFF		-
									-
									-
		0.5		СН	Silty CLAY; medium to high plasticity fines, some fine to media yellow-brown/grey, dry to moist.	um grained sand,	VERY STIFF		-
									-
									-
									-
									_
		1.01-		CL-CH	Sandy Gravelly CLAY; medium plasticity clay, fine to coarse sa medium grained sedimentary gravel, yellow-brown, dry.	and, mio to	VERY STIFF TO HARD		-
									-
									-
		1.3	1/2/2		BOREHOLE TERMINATED AT 1.3m				
									-
		-							-
Lc	u gge	<u> </u>	KA	\ \	Date : 16/06/21 Chec	cked By: J	M	Date :	17/06/21



Bore	eho	le L	og						D04
							Sheet	1 of 1	
CLIE	ENT:	S	outh	ern f	Region Land Engineering		Job No	C118	322
PRC	JEC				Grove Rural Subdivision t Road & Mountain Ash Roa	ad Goulburn NSW		on : SEE REPOR	
Equipn Hole D	nent Ty	/pe : Pl er : 50m	USH TU			,	Angle	Level: Not Know From Vertical: 0° g: N.A.	
Samples	Casing	Hade O ebth	Graphic Log	U.S.C.S.	Material Description, Struct Soil Type: Plasticity or Particle Characteri Colour, Secondary and Minor Component Moisture, Structure	cture istics, ts,	Consistency or Relative Density	Field Test Results	Geological Profile
			1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2	SM	Silty SAND; fine to medium grained sand, low pl rootlets, moist.	lasticity silt, brown, with grass	LOOSE		TOPSOIL
		0.2 .		SM	Silty Gravelly SAND; fine to medium grained san nodules, low plasticity silt, light brown, brown, dr	nd, fine gravel and ferruginous ry.	LOOSE TO MEDIUM DENSE		ALLUVIUM
		-		CH	Sandy CLAY; medium to high plasticity clay, fine moist.	e sand, orange-brown, dry to	VERY STIFF		RESIDUAL SOIL
		0.7 _		СН	CLAY; high plasticity clay, trace fine gravel and fidry.	ferruginous nodules, light brown,	VERY STIFF TO HARD		-
		1.0 -							-
		1.3			BOREHOLE TERMINATE	D AT 1.3m			-
		_							
Log	ged	<u>1.6</u> By :	KA	\ \	Date : 16/06/21	Checked By:	JM	Date :	17/06/21

Bor	ehc	ole L	og			QI	heet		DUO
						O.	iloct	1 of 1	
CLI	ENT	: S	South	ern f	Region Land Engineering	Jo	ob No.	C118	322
PR	OJE				Grove Rural Subdivision Road & Mountain Ash Road, Goulburn, NS'	w		n: SEE REPOR	
Equip Hole	oment 1 Diamet	ype : P er : 50r	USH TU	UBE DI	RILL	Aı	ngle F	rom Vertical : 0° : N.A.	
Samples	Casing	Debth Metres	Graphic Log	U.S.C.S.	Material Description, Structure Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure	Consistency	Relative Density	Field Test Results	Geological Profile
			1/2 · 2/4 /2	SM	Silty SAND; fine to medium grained sand, low plasticity silt, brown, with grass rootlets, moist.	LOOS	Ē		TOPSOIL
		0.2	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	ML	Gravelly Sandy SILT; low plasticity silt, fine to medium grained sand, fine gravel & ferruginous nodules, light brown, yellow-brown, dry.	LOOS TO MEDII DENS	им		ALLUVIUM
			-						-
		0.6	1/.0/.	SC	Gravelly Clayey SAND; fine to coarse sand, fine to medium grained gravel and	MEDII DENS			-
					ferrugiñous nodules, low plasticity clay, orange-grey, orange-brown, dry.	BENG	2		
		1.0 -							_
		1.1		СН	Sandy CLAY; medium to high plasticity clay, fine to medium grained sand, orange-grey mottled, dry to moist.	VERY			RESIDUAL SOIL
		1.3			BOREHOLE TERMINATED AT 1.3m				-
Lc	gged	1.6 d By :	KA	\ \	Date: 16/06/21 Checked By:	JM		Date :	17/06/21



Borehole Log	Sheet
Si	1 of 1
CLIENT: Southern Region Land Engineering	ob No. C11822
Rosemont Road & Mountain Ash Road, Goulburn, NSW	cocation : SEE REPORT Collar Level : Not Known Angle From Vertical : 0°
Hole Diameter: 50mm	Bearing: N.A.
Seld Burner Borner Born	Belging Field Geological Profile Results
SM Silty SAND; fine to medium grained sand, low plasticity silt, brown, with grass rootlets, moist.	SE TOPSOIL
0.2 CL Silty Sandy CLAY; low plasticity fines, fine to medium grained sand, light brown, moist.	ALLUVIUM
Silty Gravelly SAND; fine to medium grained sand, low plasticity silt, fine gravel & ferruginous nodules, light brown, orange-brown, dry to moist. Silty Gravelly SAND; fine to medium grained sand, low plasticity silt, fine gravel & DENSI	IUM SE
1.0 — Sandy CLAY; high plasticity clay, fine to medium grained sand, orange-brown, light brown, dry to moist. 1.3 BOREHOLE TERMINATED AT 1.3m	
Logged By: KA Date: 16/06/21 Checked By: JM	Date : 17/06/21

Borehole Log								D06		
3							Sheet 1 of 1			
CLIENT: Southern Region Land Engineering							Job No	Job No. C11822		
PROJECT Brisbane Grove Rural Subdivision Rosemont Road & Mountain Ash Road, Goulburn, NSW								Location: SEE REPORT Collar Level: Not Known		
		ype : P er : 50n		Angle From Vertical : 0° Bearing : N.A.						
Samples	Casing	Depth Metres	Graphic Log	U.S.C.S.	Material Description, Structure Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure	yousiste	or Or Relative Density	Field Test Results	Geological Profile	
			1/2 · 2/1/2 ·	SM	Silty SAND; fine to medium grained sand, low plasticity silt, t rootlets, moist.		OOSE		TOPSOIL -	
		0.2		SC-SM	Silty Clayey SAND; fine to coarse sand, low plasticity fines, or red-brown, dry to moist.	aan siowii,	OOSE TO MEDIUM DENSE			
		1.0		SC	Clayey Gravelly SAND; fine to coarse sand, medium plasticit medium grained sedimentary gravel, brown, light brown, dry.		DENSE		RESIDUAL SOIL	
	Extremely Weathered (EW) SILTSTONE; fine to medium dry.				Extremely Weathered (EW) SILTSTONE; fine to medium gradry.		EXTREMEL WEAK	Y	BEDROCK	
		1.3	-		BOREHOLE TERMINATED AT 1.3m				_	
Lo	gged	Ву :	ΚA	١	Date: 17/06/21 Che	cked By: J	M	Date :	17/06/21	



Borehole Log								D09		
							Sheet	1 of 1		
CLIENT: Southern Region Land Engineering								Job No. C11822		
PR	OJE				Grove Rural Subdivision t Road & Mountain Ash Road	, Goulburn, NSW	Collar I	on: SEE REPOR	n	
Equipment Type: PUSH TUBE DRILL Hole Diameter: 50mm							Angle F Bearing	Angle From Vertical : 0° Bearing : N.A.		
Samples	<u> </u>	ج آر	.je	S.	Material Description, Structu	ıre	ancy ve ity	Field	2 1 1 1	
	Casing	Debtt Metres	Graphic Log	U.S.C.	Soil Type: Plasticity or Particle Characteristic Colour, Secondary and Minor Components, Moisture, Structure	;s, 	Consistency or Relative Density	Test Results	Geological Profile	
			1. · 7. · 1. · 7. · 7. · 7. · 7. · 7. ·	SM	Silty SAND; fine to medium grained sand, low plasti rootlets, moist.		LOOSE		TOPSOIL	
			12. 3.12.						-	
		0.2	: <u>````</u> . <u>``</u>							
				SM	Silty Gravelly SAND; fine to medium grained sand, I and ferruginous nodules, light brown, moist.	low plasticity silt, fine gravel	LOOSE		ALLUVIUM	
									-	
		0.4					CTIFE TO		RESIDUAL SOIL	
				CL	Sandy Gravelly CLAY; low to medium plasticity clay gravel and ferruginous nodules, orange-brown, light	r, fine to coarse sand, fine brown, moist.	STIFF TO VERY STIFF		RESIDUAL SUIL	
		-							-	
									-	
									-	
									_	
									-	
				1						
		1.0 -								
									<u>-</u>	
		1.2								
		1.2		CH	Sandy CLAY; medium to high plasticity clay, fine to dry.	coarse sand, orange-grey,	VERY STIFF		-	
	1.3				BOREHOLE TERMINATED AT 1.3m					
									_	
		-	-						_	
		1.6	<u> </u>			<u> </u>				
Lo	gged	By:	KΑ	4	Date: 17/06/21	Checked By: .	JM	Date :	17/06/21	

	Borehole Log								Borehole No.		
	_0.	0.10	-	.~9				Sheet	1 of 1		
	CL	IENT	: 5	South	Job No	C118	322				
	PROJECT Brisbane Grove Rural Subdivision Rosemont Road & Mountain Ash Road, Goulburn, NSW								Location: SEE REPORT Collar Level: Not Known		
	Equipment Type: PUSH TUBE DRILL Hole Diameter: 50mm							Angle	Angle From Vertical : 0° Bearing : N.A.		
	Samples Casing Casing Graphic Log U.S.C.S.		Ċ.	Material Description, Structure Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure		Consistency or Or Relative Density	Field Test Results	Geological Profile			
			Metres	5 2 2 2 2 2 2 2 2 2	SM	Silty SAND; fine to medium grained sand, low plas rootlets, moist.	ticity silt, brown, with grass	LOOSE		TOPSOIL	
			0.2		СН	Silty CLAY; high plasticity fines, light brown, dry. Silty CLAY; high plasticity fines, orange-brown, dry.		VERY STIFF		RESIDUAL SOIL	
BOREHOLE/EXCAVATION LOG C11822.GPJ ACT GEO.GDT 04/07/21			1.0			BOREHOLE TERMINATED	AT 1.4m				
E/EXCAVATION										-	
BOREHOLE	Lo	Logged By: KA				Date : 16/06/21	Checked By:	JM	Date :	17/06/21	

Bor	oho	ole L	00				Boreh	ole No.	D11
БОІ	enc	ле с	.og				Sheet	1 of 1	
CLI	ENT	: 5	South	ern f	Region Land Engineering		Job No	C118	322
PR	OJE				Grove Rural Subdivision Road & Mountain Ash Ro	ad Goulburn NSW		on : SEE REPOR	
Equip Hole	oment ⁻ Diame	Type : For : 50	PUSH TU			ad, Codibarri, 14044	Angle	Level: Not Know From Vertical: 0° g: N.A.	
Samples	Casing	D ebtte	Graphic Log	U.S.C.S.	Material Description, Stru Soil Type: Plasticity or Particle Characte Colour, Secondary and Minor Componer Moisture, Structure	icture pristics, nts,	Consistency or Relative Density	Field Test Results	Geological Profile
		Wettes		SM	Silty SAND; fine to medium grained sand, low rootlets, moist.		LOOSE		TOPSOIL -
		0.3		CL	Silty CLAY; low to medium plasticity fines, light	t brown, moist.	FIRM		ALLUVIUM
		0.5	1//	CL	Silty Gravelly CLAY; low plasticity fines, fine grorange-brown, dry to moist.	avel and ferruginous nodules,	FIRM		-
		1.0		СН	Sandy CLAY; medium to high plasticity clay, fir mottled, dry.		VERY STIFF		RESIDUAL SOIL
					BOREHOLE TERMINAT	ED AT 1.4m			_
Lo	gge	1.6 d By :	KA	<u> </u>	Date : 16/06/21	Checked By:	JM	Date :	17/06/21

Bor	eho	le L	og						EU1
							Sheet	1 of 1	
CLI	CLIENT: Southern Region Land Engineering							C11	822
PR	OJE				Grove Rural Subdivision : Road & Mountain Ash Road, Goulburn, NS'	W		n : SEE REPOF Level : Not Know	
		ype : P er : 50n	USH TI				Angle F	From Vertical: 0	
Samples	Casing	Depth Metres	Graphic Log	U.S.C.S.	Material Description, Structure Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure		or Relative Density	Field Test Results	Geological Profile
		0.3	7 77 7 7 77 7 7 77 7 7 7 7 7 7 7 7 7 7	SM	Silty SAND; fine to medium grained sand, low plasticity silt, brown, dark brown, with grass rootlets, moist.	LO	OSE		TOPSOIL -
		0.5		CL	Silty Sandy CLAY; low plasticity fines, fine to coarse sand, trace fine gravel and ferruginous nodules, light brown, moist.	FIR	RM		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.	VE STI	IFF		RESIDUAL SOIL
		1.0 -		СН	Sandy CLAY; medium to high plasticity clay, fine to coarse sand, orange-grey mottled, brown, dry.	VE STI	RY IFF		-
		1.3							-
					BOREHOLE TERMINATED AT 1.3m				-
		-	1						-
Lo	gged	1.6 By:	KA	\ \	Date: 17/06/21 Checked By:	JM	1	Date :	17/06/21

Borehole No.

Borehole Log			Borehole	No.	E02
Borellole Log			Sheet	1 of 1	
CLIENT: Souther	n Region Land Engineering		Job No.	C118	22
	e Grove Rural Subdivision nt Road & Mountain Ash Roa	ad Goulburn NSW		: SEE REPORT	
Equipment Type : PUSH TUBE Hole Diameter : 50mm		aa, Godisam, Nov		evel: Not Knowr om Vertical: 0° : N.A.	1
Samples Casing Casing Graphic Log	j	ristics,	or Relative Density	Field Test Results	Geological Profile
	M Silty SAND; fine to medium grained sand, low pwith grass rootlets, moist.	plasticity silt, brown, dark brown,	OOSE		TOPSOIL
	Silty Sandy CLAY; low plasticity fines, fine to m brown, moist.	nedium grained sand, brown, light	RM		ALLUVIUM -
0.5	L Silty Gravelly CLAY; low to medium plasticity fir nodules, light brown, moist to wet.	nes, fine gravel and ferruginous FI	IRM .		-
1.0-	H Sandy CLAY; medium to high plasticity clay, fin sedimentary gravel and ferruginous nodules, or	range-grey mottled dry to moist	TIFF TO ERY TIFF		RESIDUAL
1.3	BOREHOLE TERMINATI	ED AT 1.3m			
Logged By: KA	Date : 17/06/21	Checked By: JN		Date :	17/06/21



Bor	eho	le L	og						EU3
							Sheet	1 of 1	
CLI	ENT:	S	outh		Job No.	C118	822		
PR	OJEC				Grove Rural Subdivision Road & Mountain Ash Road, Goulburn, N	SW		n : SEE REPOR	
		ype : P er : 50n	USH TI				Angle F	evel: Not Know rom Vertical: 0 : N.A.	
Samples	Casing	Debth Metres	Graphic Log	U.S.C.S.	Material Description, Structure Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure	Consistency	or Relative Density	Field Test Results	Geological Profile
			14.34.15.15.15.15.15.15.15.15.15.15.15.15.15.	SM	Silty SAND; fine to medium grained sand, low plasticity silt, brown, dark brow with grass rootlets, moist.	- T-	OOSE		TOPSOIL
		0.15		CL	Sandy CLAY; low plasticity clay, fine to medium grained sand, orange-brown, trace gravel to 10mm, moist.	, FIF	RM		ALLUVIUM -
		0.4		CL-CH	Sandy Gravelly CLAY; medium plasticity clay, fine to coarse sand, fine gravel ferruginous nodules, dry to moist.	and ST	ÎFF		RESIDUAL SOIL
		0.8				V			-
		1.0 -		SC	Clayey SAND / Sandy CLAY; low to medium plasticity clay, fine to coarse san fine sedimentary gravel, dry.	", ST	ERY TIFF / ENSE		-
		1.3							-
		-	-		BOREHOLE TERMINATED AT 1.3m				-
Lc	gged	1.6 By:	KA	\ \	Date: 16/06/21 Checked By	: JN	<u> </u> И	Date :	17/06/21

Borehole No.

APPENDIX C
Laboratory Test Certificates

Client Reference: ACT Geotechnical Engineers- C11822

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
нсв	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

Envirolab Reference: 272356 Revision No: R00

Client Reference: ACT Geotechnical Engineers- C11822

Owners when the Bestivides in Cail						
Organophosphorus 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
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
Chlorpyriphos-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
Chlorpyriphos	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

Envirolab Reference: 272356 Revision No: R00

Client Reference: ACT Geotechnical Engineers- C11822

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

Envirolab Reference: 272356 Revision No: R00 APPENDIX D
Limitations of Geotechnical Report



ACT Geotechnical Engineers Pty Lt

ACN 063 673 530

5/9 Beaconsfield Street, Fyshwick ACT 2609 PO Box 9225, Deakin ACT 2600 Ph: (02) 6285 1547

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



General Information

WEM model ID 2334112 Associated DA number

Model description

Consultancy Southern Region Land Consultant gregtodd.srle@gmail.com

Engineering

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 730.0

(m2)

Number of trenches **0**

WaterNSW

A01-1 NorBE Assessment

WEM Summary

Effluent volume proposed (I/day)

800

Effluent volume calculated

(I/day)

800

WEM Model Inputs

Location

Easting **9551687.974039** Northing **4326432.862298**

Slope (m/m) 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 510

(mg/kg)

Soil depth (to impermeable layer) 1.30

(m) Soil structure **Strong**

Saturated hydraulic conductivity **0.06**

(Ksat)(m/day)

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 > 150

bores

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.



A01-2 SPA NorBE Assessment

WEM Summary version 3

General Information

WEM model ID 2334111 Associated DA number

Model description

Southern Region Land Consultancy

Engineering

Consultant reference

number

T01405

Council **Goulburn Mulwaree**

Assessing officer Associated lots

Consultant

Nominated lot 2//835278

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

gregtodd.srle@gmail.com

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(m2) 1300.0 Minimum Required area 1187.0

(m2)

Number of trenches 0

WaterNSW

version 3

A01-2 SPA NorBE Assessment

WEM Summary

Effluent volume proposed

1300

(l/day)

Effluent volume calculated

(I/day)

1300

WEM Model Inputs

Location

Easting **9551687.974039** Northing **4326432.862298**

Slope (m/m) Slope is suitable based

on site inspection (Applicable to some disposal systems on steep slopes) N/A

Strong

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 510

(mg/kg) Soil depth (to impermeable layer) **1.30**

(m) Soil structure

Saturated hydraulic conductivity **1.31**

(Ksat)(m/day)

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 > 150

bores

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.





General Information

WEM model ID 2334110 Associated DA number

Model description

Southern Region Land Consultancy

Engineering

Consultant reference

number

Nominated lot

T01405

Council **Goulburn Mulwaree**

> 2//835278 Associated lots

Consultant

Assessing officer

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

gregtodd.srle@gmail.com

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 730.0

(m2)

Number of trenches 0

WaterNSW

A01-3 NorBE Assessment

WEM Summary

Effluent volume proposed (I/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 steep ske

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 510

(mg/kg) Soil depth (to impermeable layer) **1.30**

(m) Soil structure **Strong**

Saturated hydraulic conductivity **1.31**

(Ksat)(m/day)

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 > 150

bores

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.





General Information

WEM model ID 2334818 Associated DA number

Model description

Consultancy Southern Region Land

Engineering

Linginicaling

Consultant reference

number

T01405

Council Goulburn Mulwaree

Nominated lot 2//835278

Development class Subdivision unsewered >=4 lots

Assessing officer

Associated lots

N/A

(m2)

Consultant **gregtodd.srle@gmail.com**

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

Lot boundary

WEM Model Run Summary

Model run outcome **Pending**

Any of the sub-surface plumes reaches:

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 **730.0**

Number of trenches **0**

WaterNSW

version 3



WEM Summary

Effluent volume proposed (I/day)

800

Effluent volume calculated

(I/day)

800

WEM Model Inputs

Location

Easting **9551146.503076** Northing **4326517.820624**

Slope (m/m) 0.04222 Slope is suitable based N/A

on site inspection (Applicable to some disposal systems on steep slopes)

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 380

(mg/kg)

Soil depth (to impermeable layer) 1.30

(m) Soil structure **Moderate**

Saturated hydraulic conductivity **1.30**

(Ksat)(m/day)

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 dpression > **50**

Distance to watercourses and water supply reservoirs

> 120

Distance to licenced drinking water > 150

bores

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

Consultant

Assessing officer

N/A

General Information

WEM model ID 2334823 Associated DA number

Model description

Southern Region Land Consultancy

Engineering

Consultant reference

number

Nominated lot

T01405

Council **Goulburn Mulwaree**

> 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

gregtodd.srle@gmail.com

Date of model run

Lot boundary

WEM Model Run Summary

Model run outcome **Pending**

Any of the sub-surface plumes reaches:

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 730.0 (m2)

Number of trenches 0

WaterNSW

A02-2 NorBE Assessment

WEM Summary

Effluent volume proposed (I/day)

800

Effluent volume calculated

(I/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 380

(mg/kg)

Soil depth (to impermeable layer) 1.30

(m) Soil structure **Moderate**

Saturated hydraulic conductivity

(Ksat)(m/day)

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

0.06

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

rcourses and > 120

Distance to licenced drinking water > 150

bores

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

Consultant

Assessing officer

General Information

WEM model ID 2334824 Associated DA number

Model description

Consultancy **Southern Region Land**

Engineering

Consultant reference

number

Nominated lot

T01405

Goulburn Mulwaree Council

> 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

gregtodd.srle@gmail.com

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(m2) 150.0 Minimum Required area 120.0

(m2)

Number of trenches 2





Effluent volume proposed

(I/day)

400

Effluent volume calculated

(I/day)

600

WEM Model Inputs

Development type

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

Soil structure

Development steep slopes)

Dwellings Development detail

Water supply type Rainwater Spa Bath No

Continuous system use Yes

Treatment system Septic tank Disposal system Absorption trench – primary

effluent

Moderate

3 bedrooms

N/A

Site

Lot size(m2) 4000

Subject to severe frost **No** Bulk density(g/cm3) **1.80**

Vegetation for nutrient uptake Lawn - unmanaged Phosphorus sorption 380

(mg/kg)

Soil depth (to impermeable layer) 1.30 (m)

Saturated hydraulic conductivity **0.06**

(Ksat)(m/day)

at)(m/day)

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 dpression > **50**

Distance to watercourses and > 1

water supply reservoirs

> 120

Distance to licenced drinking water > 150

bores

WEM Plume Map



A06-1 **NorBE** Assessment

WEM Summary

General Information

WEM model ID 2334825 Associated DA number

Consultant

N/A

(m2)

Model description

Southern Region Land Consultancy

Engineering

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

gregtodd.srle@gmail.com

Date of model run

Lot boundary

WEM Model Run Summary

Model run outcome **Pending**

Any of the sub-surface plumes reaches:

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 730.0

Number of trenches 0

WaterNSW

version 3



WEM Summary

Effluent volume proposed (I/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 500

(mg/kg)

Soil depth (to impermeable layer) 1.40

(m) Soil structure **Weak**

Saturated hydraulic conductivity **1.00**

(Ksat)(m/day)

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 dpression > **50**

Distance to watercourses and

water supply reservoirs

> 120

Distance to licenced drinking water > 150

bores

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.





General Information

WEM model ID 2334828 Associated DA number

Model description Concept effluent treatment

Consultancy Southern Region Land Consultant gregtodd.srle@gmail.com

Engineering

Consultant reference

number

T01405

Council **Goulburn Mulwaree** Assessing officer

Nominated lot 1//853498 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 **730.0**

(m2)

Number of trenches **0**

WaterNSW





Effluent volume proposed

(I/day)

Effluent volume calculated (I/day)

800

800

WEM Model Inputs

Location

4326683.866589 Easting 9550898.493270 Northing

0.02291 Slope (m/m) Slope is suitable based N/A

on site inspection (Applicable to some disposal systems on

Development steep slopes)

Development type **Dwellings** Development detail 4 bedrooms

Rainwater Nο Water supply type Spa Bath

Yes Continuous system use

AWTS standard Treatment system **Irrigation sub-surface** Disposal system

Site

Lot size(m2) 4000

Subject to severe frost 1.60 No Bulk density(g/cm3)

Vegetation for nutrient uptake 380 Lawn - unmanaged Phosphorus sorption

(mg/kg)

Soil depth (to impermeable layer) 1.20

Soil structure Weak

Saturated hydraulic conductivity 0.20

(Ksat)(m/day)

Clay loams Soil texture

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%

> 50 Distance to drainage dpression

Distance to watercourses and

water supply reservoirs

> 120

Distance to licenced drinking water > 150

bores

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.





version 3

General Information

WEM model ID 2335120 Associated DA number

Model description Concept effluent management

Consultancy Southern Region Land Consultant gregtodd.srle@gmail.com

Engineering

Consultant reference

number

T01405

Council **Goulburn Mulwaree** Assessing officer

Nominated lot 1//853498 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

Lot boundary

WEM Model Run Summary

Model run outcome **Pending**

Any of the sub-surface plumes reaches:

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

N/A

Proposed area(m2) 800.0 Minimum Required area (m2) (m2)

Number of trenches **0**

WaterNSW

version 3



WEM Summary

Effluent volume proposed (I/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 N/A

on site inspection (Applicable to some disposal systems on steep slopes)

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 400

(mg/kg)

Soil depth (to impermeable layer) **1.00**

(m) Soil structure **High/moderate**

Saturated hydraulic conductivity **1.00**

(Ksat)(m/day)

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 dpression > **50**

Distance to watercourses and

water supply reservoirs

> 120

Distance to licenced drinking water > 150

bores

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.





version 3 **General Information**

WEM model ID 2335121 Associated DA number

Concept effluent management Model description

Southern Region Land Consultancy Consultant gregtodd.srle@gmail.com

Engineering

Consultant reference

number

T01405

Council **Goulburn Mulwaree** Assessing officer

Nominated lot 1//853498 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 730.0

(m2)

Number of trenches 0

WaterNSW

version 3



WEM Summary

Effluent volume proposed (I/day)

800

Effluent volume calculated

800

(I/day)

WEM Model Inputs

Development type

Location

4327243.404693 Easting 9550647.406968 Northing

0.01281 Slope (m/m) Slope is suitable based N/A

on site inspection (Applicable to some disposal systems on steep slopes)

Development

Dwellings Development detail 4 bedrooms

Rainwater Nο Water supply type Spa Bath

Yes Continuous system use

AWTS standard Treatment system **Irrigation sub-surface** Disposal system

Site

Lot size(m2) 4000

Subject to severe frost 1.60 No Bulk density(g/cm3)

Vegetation for nutrient uptake 590 Lawn - unmanaged Phosphorus sorption

(mg/kg)

Soil depth (to impermeable layer) 1.00

Soil structure Moderate

Saturated hydraulic conductivity 1.00

(Ksat)(m/day)

Light clays Soil texture

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%

> 50 Distance to drainage dpression

Distance to watercourses and

water supply reservoirs

> 120

Distance to licenced drinking water > 150

bores

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.





General Information

WEM model ID 2335122 Associated DA number

Model description Concept effluent management

Consultancy Southern Region Land Consultant gregtodd.srle@gmail.com

Engineering

Consultant reference

number

T01405

Council Goulburn Mulwaree

Assessing officer
Associated lots

Nominated lot **1//731427**

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) **30.0** Width (up slope)(m) **28.0**

Proposed area(m2) 840.0 Minimum Required area (m2) 730.0 (m2)

Number of trenches **0**

WaterNSW





Effluent volume proposed

(I/day)

800

Effluent volume calculated

(I/day)

800

WEM Model Inputs

Location

Easting 9552297.015593 Northing 4325911.594827

Slope (m/m) **0.01811** Slope is suitable based **N/A**

on site inspection (Applicable to some disposal systems on steep slopes)

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(q/cm3) **2.00**

Vegetation for nutrient uptake Lawn - unmanaged Phosphorus sorption 600

(mg/kg)

Soil depth (to impermeable layer) 0.90

(m) Soil structure **Weak/massive**

Saturated hydraulic conductivity

(Ksat)(m/day)

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

0.06

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 > 150

bores

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.



C03-1 **NorBE** Assessment

WEM Summary

version 3

General Information

WEM model ID 2335124 Associated DA number

Concept effluent management Model description

Southern Region Land Consultancy Consultant gregtodd.srle@gmail.com

Engineering

Consultant reference

number

T01405

Council **Goulburn Mulwaree** Assessing officer

Associated lots

Nominated lot 1//731427

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

126140

106

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 730.0

(m2)

Number of trenches 0

WaterNSW

version 3



WEM Summary

Effluent volume proposed (I/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 500

(mg/kg)

Soil depth (to impermeable layer) **1.40**

(m) Soil structure **Moderate**

Saturated hydraulic conductivity **0.06**

(Ksat)(m/day)

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 dpression > **50**

Distance to watercourses and

water supply reservoirs

> 120

Distance to licenced drinking water > 150

bores

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.

