Project Name: **Improving Soil Survey Field Measurement and Interpretation. LWRRDC Project No. 90/R16**
Project Code: **Morphology** **Site ID:** **CP332** **Observation ID:** **1**
Agency Name: **CSIRO Division of Soils (ACT)**

Site Information

Desc. By:	N.J. McKenzie	**Locality:**	
Date Desc.:	01/12/93	**Elevation:**	2 metres
Map Ref.:	Sheet No. : 9435-1-N 1:25000	**Rainfall:**	1300
Northing/Long.:	6564700 AMG zone: 56	**Runoff:**	Slow
Easting/Lat.:	488700 Datum: AGD66	**Drainage:**	Imperfectly drained

Geology

ExposureType:	Soil pit	**Conf. Sub. is Parent. Mat.:**	No Data
Geol. Ref.:	AL	**Substrate Material:**	Soil pit, 1.5 m deep,Slightly porous, Silt

Land Form

Rel/Slope Class:	Gently undulating plains <9m 1-3%	**Pattern Type:**	Flood plain
Morph. Type:	Flat	**Relief:**	3 metres
Elem. Type:	Backplain	**Slope Category:**	Very gently sloped
Slope:	1 %	**Aspect:**	0 degrees

Surface Soil Condition (dry): Firm

Erosion:

Soil Classification

Australian Soil Classification:
Stratic Rudosol
ASC Confidence:
No analytical data are available but confidence is fair.

Mapping Unit: N/A
Principal Profile Form: Um6.14
Great Soil Group: N/A

Site Disturbance: Complete clearing. Pasture, native or improved, cultivated at some stage

Vegetation: Low Strata - Sod grass, <0.25m, Closed or dense. *Species includes - None recorded

Surface Coarse Fragments: No surface coarse fragments

Profile Morphology

A11	0 - 0.08 m	Dark brown (10YR3/3-Moist); Light brownish grey (10YR6/2-Dry); ; Silty loam; Massive grade of structure; Earthy fabric; Dry; Firm consistence; Field pH 5.5 (Raupach); Many, fine (1-2mm) roots; Clear, Smooth change to -
A12	0.08 - 0.16 m	Very dark greyish brown (10YR3/2-Moist); , 7.5YR46, 10-20% , 0-5mm, Distinct; Silty loam; Massive grade of structure; Earthy fabric; Dry; Firm consistence; Field pH 6 (Raupach); Many, fine (1-2mm) roots; Abrupt, Smooth change to -
2A1	0.16 - 0.34 m	Dark grey (10YR4/1-Moist); , 7.5YR46, 2-10% , 0-5mm, Faint; Silty clay loam; Weak grade of structure, 10-20 mm, Polyhedral; Rough-ped fabric; Moderately moist; Very firm consistence; Field pH 6.5 (Raupach); Many, fine (1-2mm) roots; Gradual, Smooth change to -
2B21	0.34 - 0.5 m	Dark grey (10YR4/1-Moist); , 7.5YR46, 2-10% , 0-5mm, Faint; Silty clay loam; Weak grade of structure, 10-20 mm, Polyhedral; Rough-ped fabric; Moderately moist; Very firm consistence; Field pH 6.5 (Raupach); Many, fine (1-2mm) roots; Gradual, Smooth change to -
2B22	0.5 - 0.65 m	Dark grey (10YR4/1-Moist); , 10YR44, 10-20% , 0-5mm, Faint; Silty clay loam; Weak grade of structure, 10-20 mm, Polyhedral; Rough-ped fabric; Moderately moist; Very firm consistence; Field pH 6.5 (Raupach); Common, fine (1-2mm) roots; Abrupt, Smooth change to -
3A1	0.65 - 0.74 m	Dark grey (10YR4/0-Moist); , 10YR32, 20-50% , 5-15mm, Distinct; Silty clay loam; Weak grade of structure, 20-50 mm, Polyhedral; Rough-ped fabric; Moderately moist; Very firm consistence; Field pH 6.5 (Raupach); Common, fine (1-2mm) roots; Clear, Smooth change to -
3B2	0.74 - 1 m	Dark grey (10YR4/1-Moist); , 10YR32, 20-50% , 5-15mm, Distinct; , 7.5YR46, 20-50% , 5-15mm, Distinct; Light clay; Weak grade of structure, 20-50 mm, Polyhedral; Rough-ped fabric; Moderately moist; Very firm consistence; Field pH 6.5 (Raupach); Common, fine (1-2mm) roots; Clear, Smooth change to -
4A1	1 - 1.1 m	Very dark grey (10YR3/1-Moist); , 10YR32, 10-20% , 5-15mm, Faint; Light clay; Weak grade of structure, 20-50 mm, Polyhedral; Rough-ped fabric; Moderately moist; Very firm consistence; Field pH 6.5 (Raupach); Common, very fine (0-1mm) roots; Clear, Smooth change to -

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4B2	1.1 - 1.5 m	Dark yellowish brown (10YR4/4-Moist); , 10YR61, 20-50% , 15-30mm, Distinct; Light clay; Moderate grade of structure, 10-20 mm, Subangular blocky; Moderate grade of structure, 20-50 mm, Subangular blocky; Rough-ped fabric; Moderately moist; Very firm consistence; Few (2 - 10 %), Ferromanganiferous, Fine (0 - 2 mm), Soft segregations; Field pH 6.5 (Raupach); Common, very fine (0-1mm) roots;

Morphological Notes

2B21	Mottles increasing down profile
3A1	A1's are only evident when solum is dry - moist colours are very similar.
4B2	Has different mottle.

Observation Notes

Despite buried layers; the physical properties (Particularly porosity) grades down the profile. Roots and pore distribution decreases with depth. Very clear ex-ped mottles in the constrasting IVB2. Gladstone soil landscape of Glenn Atkinson

Site Notes

Kempsey (Morph 31)

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Laboratory Test Results:

Depth	pH	1:5 EC	Exchangeable Cations				Exchangeable	CEC	ECEC	ESP
			Ca	Mg	K	Na	Acidity			
m		dS/m	Cmol (+)/kg							%
0 - 0.08	5A	0.37A	4.3B	3.2	0.37	0.22		8.1A		2.72
0.08 - 0.16	5.28A	0.57A	6.1B	4.9	0.22	0.68		11.8A		5.76
0.16 - 0.34	5.7A	0.68A	7.6B	6.1	0.14	1.1		14.9A		7.38
0.18 - 0.38										
0.18 - 0.38										
0.34 - 0.5	5.82A	0.93A	5B	6	0.24	1.8		13.1A		13.74
0.5 - 0.65	5.96A	1.09A	3.3B	6.5	0.11	2.5		12.4A		20.16
0.65 - 0.74	5.88A	1.36A	4.8B	7.5	0.13	2.7		15.1A		17.88
0.65 - 0.85										
0.65 - 0.85										
0.74 - 1	5.8A	1.39A	4.5B	7.5	0.14	2.7		14.9A		18.12
1 - 1.1	5.77A	1.61A	4B	7.7	0.13	3		14.9A		20.13
1.1 - 1.5	5.83A	1.54A	2.6B	7	0.13	2.4		12.1A		19.83
1.2 - 1.4										
1.2 - 1.4										

Depth	CaCO3	Organic C	Avail. P	Total P	Total N	Total K	Bulk Density	Particle Size Analysis GV	CS	FS	Silt	Clay
m	%	%	mg/kg	%	%	%	Mg/m3			%		
0 - 0.08		3.77B						0				
0.08 - 0.16		2.95B						0				
0.16 - 0.34		2.6B					1.19	0				
0.18 - 0.38							1.20					
							1.18					
0.18 - 0.38							1.20					
							1.18					
0.34 - 0.5		1.1B						0				
0.5 - 0.65		0.8B						0				
0.65 - 0.74		0.92B					1.61	0				
0.65 - 0.85							1.36					
							1.35					
							1.40					
							1.40					
0.65 - 0.85							1.36					
							1.35					
							1.40					
							1.40					
0.74 - 1		0.78B						0				
1 - 1.1		0.97B						0				
1.1 - 1.5		0.62B					1.28	0				
1.2 - 1.4							1.37					
							1.34					
							1.19					
							1.33					
1.2 - 1.4							1.37					
							1.34					
							1.19					
							1.33					

Depth	COLE	Gravimetric/Volumetric Water Contents						K sat	K unsat
		Sat.	0.05 Bar	0.1 Bar	0.5 Bar	1 Bar	5 Bar	15 Bar		
m		g/g - m3/m3							mm/h	mm/h

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0 - 0.08									
0.08 - 0.16									
0.16 - 0.34	0.029B								
0.18 - 0.38		0.51E	0.47E	0.43E	0.38D	0.17F	0.13F	16.5D	13.4A
		0.51E	0.46E	0.43E	0.37D	0.16F	0.12F		
0.18 - 0.38		0.51E	0.47E	0.43E	0.38D	0.17F	0.13F	16.5D	13.4A
		0.51E	0.46E	0.43E	0.37D	0.16F	0.12F		
0.34 - 0.5									
0.5 - 0.65									
0.65 - 0.74	0.033B								
0.65 - 0.85		0.42E	0.37E	0.35E	0.32D	0.24F	0.17F	53.1D	19.5A
		0.43E	0.37E	0.36E	0.32D	0.25F	0.17F		
		0.44E	0.38E	0.36E	0.32D				
		0.42E	0.37E	0.35E	0.32D				
0.65 - 0.85		0.42E	0.37E	0.35E	0.32D	0.24F	0.17F	53.1D	19.5A
		0.43E	0.37E	0.36E	0.32D	0.25F	0.17F		
		0.44E	0.38E	0.36E	0.32D				
		0.42E	0.37E	0.35E	0.32D				
0.74 - 1									
1 - 1.1									
1.1 - 1.5	0.046B								
1.2 - 1.4		0.44E	0.41E	0.4E	0.37D	0.28F	0.21F	56.9D	6.7A
		0.45E	0.41E	0.4E	0.37D	0.28F	0.2F		
		0.49E	0.45E	0.41E	0.35D				
		0.46E	0.42E	0.41E	0.38D				
1.2 - 1.4		0.44E	0.41E	0.4E	0.37D	0.28F	0.21F	56.9D	6.7A
		0.45E	0.41E	0.4E	0.37D	0.28F	0.2F		
		0.49E	0.45E	0.41E	0.35D				
		0.46E	0.42E	0.41E	0.38D				

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Laboratory Analyses Completed for this profile

15A2_CA	Exchangeable bases (Ca2+,Mg2+,Na+,K+) - 1M ammonium chloride at pH 7.0, pretreatment for soluble salts
15A2_CEC	Exchangeable bases- 1M ammonium chloride at pH 7.0, pretreatment for soluble salts
15A2_K	Exchangeable bases- 1M ammonium chloride at pH 7.0, pretreatment for soluble salts
15A2_MG	Exchangeable bases- 1M ammonium chloride at pH 7.0, pretreatment for soluble salts
15A2_NA	Exchangeable bases- 1M ammonium chloride at pH 7.0, pretreatment for soluble salts
3A1	EC of 1:5 soil/water extract
4A1	pH of 1:5 soil/water suspension
6B2	Total organic carbon - high frequency induction furnace, volumetric
P10_GRAV	Gravel (%)
P10_S_0.20	0.20 micron (cumulative %) - Sedigraph
P10_S_0.48	0.48 micron (cumulative %) - Sedigraph
P10_S_1	1 micron (cumulative %) - Sedigraph
P10_S_1000	1000 micron (cumulative %) - Sedigraph
P10_S_125	125 micron (cumulative %) - Sedigraph
P10_S_15.6	15.6 micron (cumulative %) - Sedigraph
P10_S_2	2 micron (cumulative %) - Sedigraph
P10_S_20	20 micron (cumulative %) - Sedigraph
P10_S_2000	2000 micron (cumulative %) - Sedigraph
P10_S_250	250 micron (cumlative %) - Sedigraph
P10_S_3.9	3.9 micron (cumulative %) - Sedigraph
P10_S_31.2	31.2 micron (cumulative %) - Sedigraph
P10_S_500	500 micron (cumulative %) - Sedigraph
P10_S_53	53 micron (cumulative %) - Sedigraph
P10_S_63	63 micron (cumulative %) - Sedigraph
P10_S_7.8	7.8 micron (cumulative %) - Sedigraph
P3A1	Bulk density - g/cm3
P3B2VL_15	15 BAR Moisture m3/m3 - Volumetric using disturbed sample on pressure plate
P3B2VL_5	5 BAR Moisture m3/m3 - Volumetric using disturbed sample on pressure plate
P3B3VLb001	0.01 BAR Moisture m3/m3 - Volumetric using undisturbed 73mm diameter and 75mm height core on suction plate taken from center of large core (CSIRO Div of Soil, DR 125, McKenzie and Jacquier, 1996)
P3B3VLb003	0.03 BAR Moisture m3/m3 - Volumetric using undisturbed 73mm diameter and 75mm height core on suction plate taken from center of large core (CSIRO Div of Soil, DR 125, McKenzie and Jacquier, 1996)
P3B3VLb005	0.05 BAR Moisture m3/m3 - Volumetric using undisturbed 73mm diameter and 75mm height core on suction plate taken from center of large core (CSIRO Div of Soil, DR 125, McKenzie and Jacquier, 1996)
P3B3VLb01	0.1 BAR Moisture m3/m3 - Volumetric using undisturbed 73mm diameter and 75mm height core on suction plate taken from center of large core (CSIRO Div of Soil, DR 125, McKenzie and Jacquier, 1996)
P3B3VLb05	0.5 BAR Moisture m3/m3 - Volumetric using undisturbed 73mm diameter and 75mm height core on suction plate taken from center of large core (CSIRO Div of Soil, DR 125, McKenzie and Jacquier, 1996)
P3B3VLbSAT	Saturated Moisture m3/m3 - Volumetric using undisturbed 73mm diameter and 75mm height core on suction plate taken from center of large core (CSIRO Div of Soil, DR 125, McKenzie and Jacquier, 1996)
P4_50_McK	Unsaturated Hydraulic Conductivity - 50mm potential (CSIRO Div of Soil, DR 125, McKenzie and Jacquier, 1996)
P4_sat_McK	Saturated Hydraulic Conductivity (CSIRO Div of Soil, DR 125, McKenzie and Jacquier, 1996)
P5_LS_MOD	Modified linear shrinkage (McKenzie, Jacquier and Ringrose-Voase, AJSR, 1994, 32, 931-8)