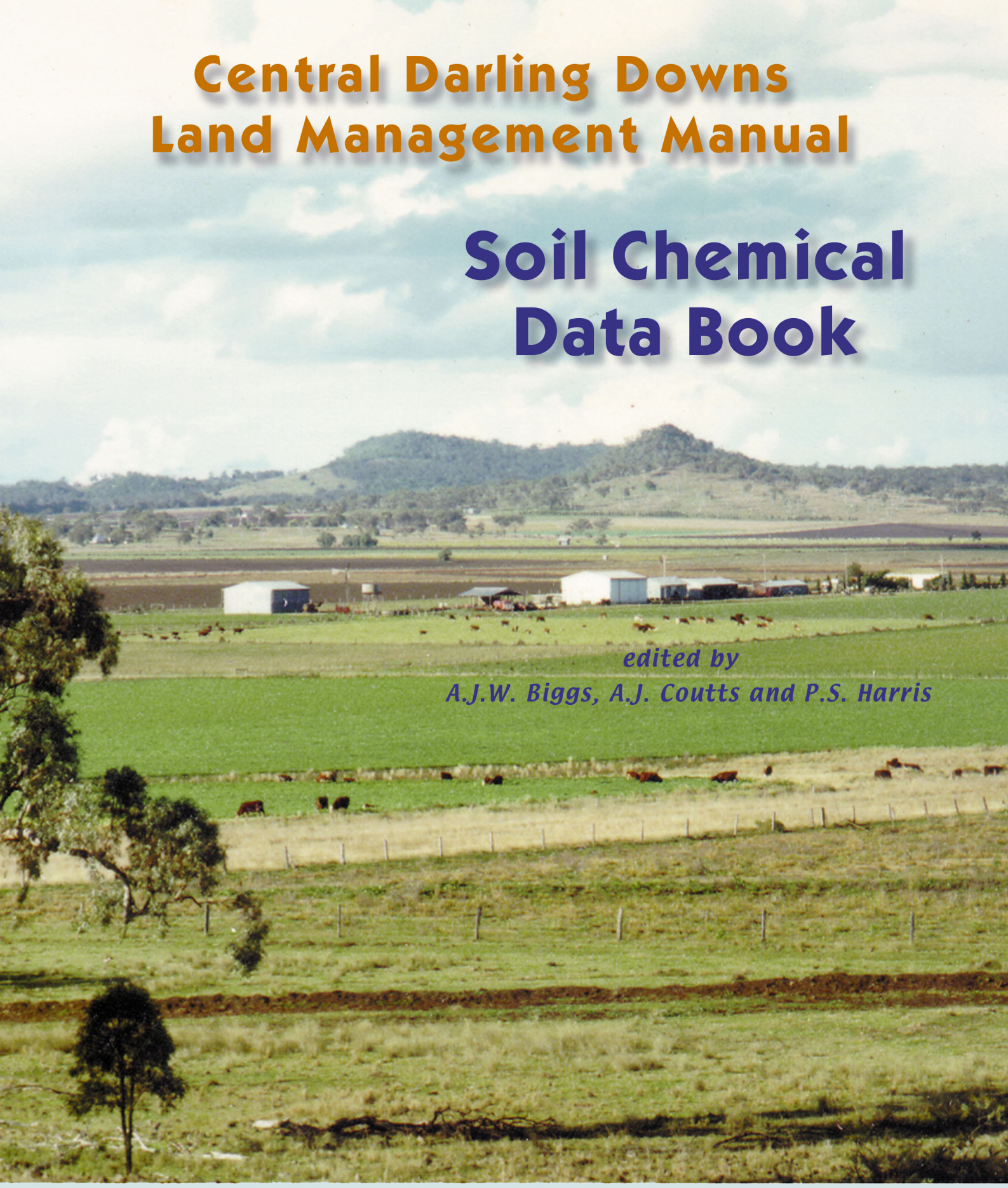
Central Darling Downs Land Management Manual

Soil Chemical Data Book



edited by
A.J.W. Biggs, A.J. Coutts and P.S. Harris

Understanding and Managing Land

in

Wambo, Pittsworth, Rosalie, Millmerran, Jondaryan Shires, Dalby Town and Toowoomba City

Department of Natural Resources
DNRQ990102

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Edited by A.J.W. Biggs, A.J. Coutts and P.S. Harris

Department of Natural Resources
Queensland, 1999

QUEENSLAND GOVERNMENT

NATURAL RESOURCES Queensland

DPI QUEENSLAND DEPARTMENT OF PRIMARY INDUSTRIES

Natural Heritage Trust

ISBN 0 7345 1610 X

1. This part of the publication should be referenced as follows:

Biggs, A.J.W., Coutts, A.J. and Harris, P.S. (1999). Soil Chemical Data Book, in *Central Darling Downs Land Management Manual*. Department of Natural Resources, Queensland. DNRQ990102.

2. Whole publication should be referenced as follows:

Harris, P.S., Biggs, A.J.W. and Stone, B.J. (eds). (1999). *Central Darling Downs Land Management Manual*. Department of Natural Resources, Queensland. DNRQ990102.

3. Other parts of the publication include:

Harris, P.S., Biggs, A.J.W., Stone, B.J., Crane, L.N. and Douglas, N.J. (eds). (1999). Resource Information Book, in *Central Darling Downs Land Management Manual*. Department of Natural Resources, Queensland. DNRQ990102

Harris, P.S., Biggs, A.J.W. and Coutts, A.J. (1999). Field Manual, in *Central Darling Downs Land Management Manual*. Department of Natural Resources, Queensland. DNRQ990102.

Maher, J.M., Harris, P.S. and Biggs, A.J.W. (1998). *Central Darling Downs Land Resource Areas Map (1:250 000)*. Department of Natural Resources, Queensland. 97-MCD-I-P3107.

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Acknowledgments

The compilation of this book has drawn upon data from numerous projects conducted over many years on the Central Darling Downs. It is the first time such a document has been compiled, and should provide a valuable resource for years to come. Special thanks to Geoff Sharp, for years of tracking down data; and Merianne Dowling, Vicki Birch and Jodie McLoughlin for typing.

Dennis Baker and staff of the Analytical Centre, Resource Sciences and Knowledge, Indooroopilly are acknowledged for the laboratory analyses of the soil samples. Special mention is made of the landholders throughout the area who allowed access to their properties, particularly those who participated in over 30 soil field days and provided valuable local knowledge on management techniques. Cliff Thompson has gratefully provided permission for the reproduction of CSIRO data.

Production of the Soil Chemical Data Book

Compilation – Alistair Coutts, Andrew Biggs, Paul Harris, Geoff Sharp and Ben Harms
Editing – Paul Harris, Andrew Biggs, Alistair Coutts, Barry Stone and Ian Heiner

1. Introduction

The ***Soil Chemical Data Book*** is one of four parts in the *Central Darling Downs Land Management Manual*. The parts of the Land Management Manual are:

- The ***Land Resource Area Map*** (*LRA Map* in back pocket) is a full colour map showing the distribution of Land Resource Areas or landscape units within the Central Darling Downs. Each Land Resource Area is made up of a series of common and associated soils with key landscape and vegetation characteristics.

- The ***Field Manual,*** with summary sheets for 68 soils, is the core and most important component of the package. It provides a summary of the soil and land characteristics of the area, and provides recommendations for appropriate management and use. This section also provides information on how to identify soils, using visual aids including diagrams, tables, summary sheets and landscape/soil photographs.

- The ***Resource Information Book*** is a reference document that provides a regional overview on natural resources and places the soils information from the *Field Manual* within this context. Potential land use/land management problems are described, and recommendations made regarding prevention and solutions of these problems.

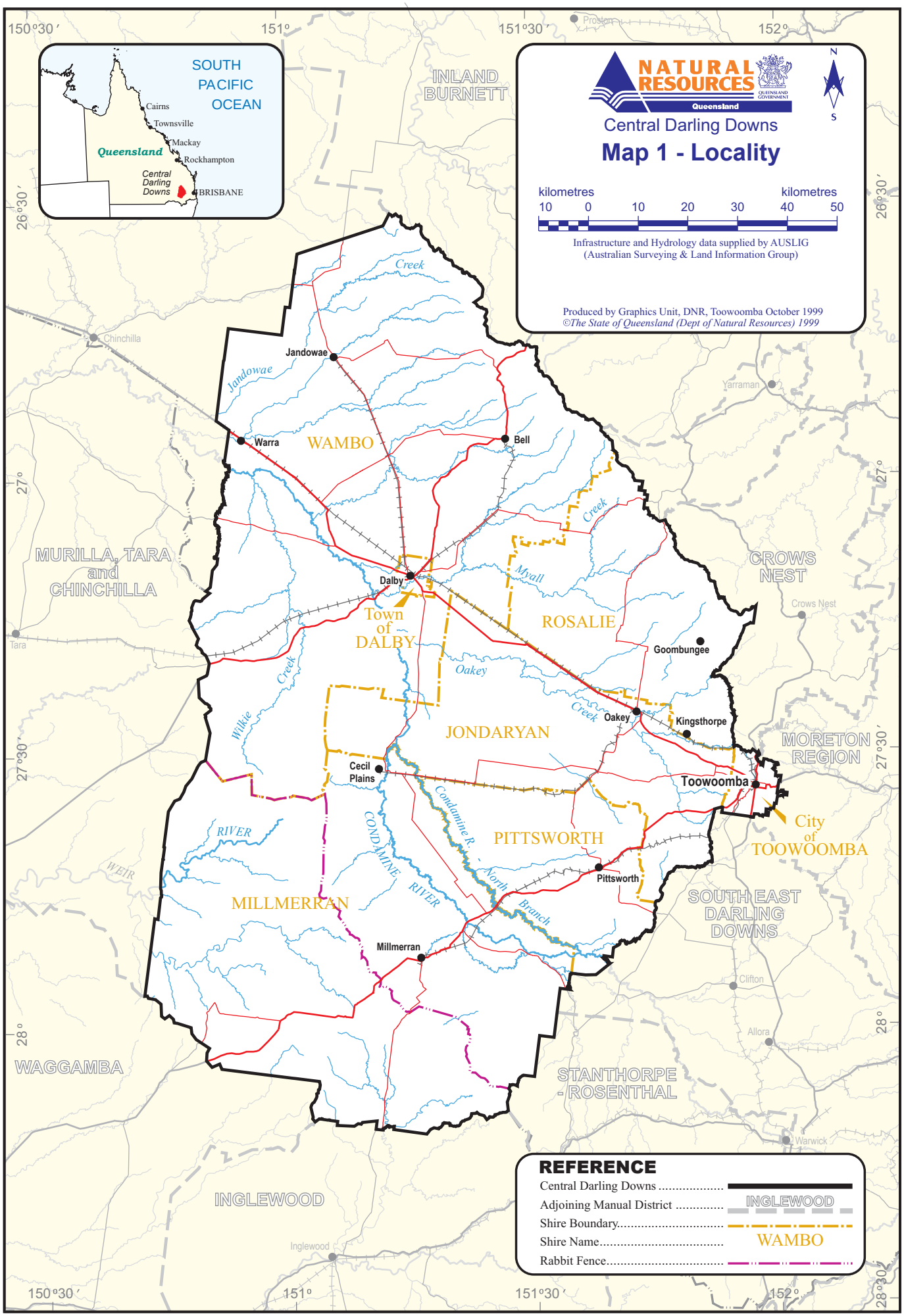
- The ***Soil Chemical Data Book*** is a reference document containing analytical data from representative soil profiles supporting the *Field Manual*.

This book was compiled to provide a stand-alone reference of analytical data for soils of the Central Darling Downs, but it should be used in conjunction with the other parts of the Land Management Manual.

What area does this book cover?

The area covered by the *Soil Chemical Data Book* (Map 1) largely includes the central Condamine catchment. This is bounded by the Great Dividing Range to the east and north, the Kumbarilla Ranges to the west, the Texas Block to the south, and includes the broad area of Condamine River floodplains in the centre of the catchment. The data in this book is associated with the soils of the 14 Land Resource Areas (LRAs) for the 1.49 million hectares in the shires of Wambo, Pittsworth, Millmerran, Jondaryan, Rosalie (excluding Division 4), the town of Dalby and the city of Toowoomba. Note that some of the data presented in this book has come from sites outside of the area delineated on the map.

For further information on adjacent Land Management Manuals and supporting land resource studies, refer to sections 1.3 and 1.4 of the *Resource Information Book*.


NATURAL RESOURCES
Queensland
Central Darling Downs
Map 1 - Locality
kilometres
10 0 10 20 30 40 50
kilometres
Infrastructure and Hydrology data supplied by AUSLIG
(Australian Surveying & Land Information Group)
Produced by Graphics Unit, DNR, Toowoomba October 1999
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SOUTH PACIFIC OCEAN
Cairns
Townsville
Mackay
Rockhampton
Queensland
Central Darling Downs
BRISBANE
INLAND BURNETT
WAMBO
ROSALIE
JONDARYAN
PITTSWORTH
MILLMERRAN
Town of DALBY
City of TOOWOOMBA
MURILLA, TARA and CHINCHILLA
CROWS NEST
MORETON REGION
SOUTH EAST DARLING DOWNS
STANTHORPE - ROSENTHAL
WAGGAMBA
INGLEWOOD
Jandowae
Warra
Bell
Dalby
Goombungee
Oakey
Kingsthorpe
Cecil Plains
Toowoomba
Pittsworth
Millmerran
Chinchilla
Tara
Yarraman
Crows Nest
Clifton
Allora
Warwick
Inglewood
Proston
Creek
Jandowae
Myall
Wilkie
Oakey
Condamine R.
North Branch
CONDAMINE RIVER
RIVER
WEIR
150°30′
151°
151°30′
152°
26°30′
27°
27°30′
28°
REFERENCE
Central Darling Downs
Adjoining Manual District
INGLEWOOD
Shire Boundary
Shire Name
WAMBO
Rabbit Fence

2. Using this book

2.1 What does the book contain?

This book contains detailed description and analytical data for 68 representative soil profiles. The data is from profiles chosen to be representative of each soil type. Where possible, the soil profile samples have been taken from virgin sites, in order to provide an indication of "base-line' nutrient levels. For some soils this was not possible, or a second profile was analysed from cultivated land in order to provide an indication of a soil's condition under current management practices.

The soils are listed in alphabetical order. Some data (e.g. for soils such as *Chinchilla*, *Calingunee* and *Banca*) was taken from adjacent manuals i.e. the Murilla, Tara and Chinchilla Shires, Waggamba and Stanthorpe-Rosenthal Manuals. Other data was derived from research projects, unpublished analyses and historical CSIRO sources. The source of the data is indicated by a project code, which precedes the site number on each profile. The list of sources, with their corresponding project codes is provided in Table 2.1.

Table 2.1 Sources of analytical data

Project Code	Project
B	CSIRO (Reeve *et al.*, 1960)
EDS	Eastern Downs Survey (Biggs, 1999)
MCD	Central Darling Downs Land Management Manual
MWD	Murilla, Tara and Chinchilla Shires Manual (Maher, 1996b)
SPFD	Soil Pit Field Days (Harms)
SRM	Stanthorpe-Rosenthal Manual (Maher, 1996a)
WHE	Gardner (unpub).
WLM	Waggamba Manual (Thwaites and Macnish, 1991)

It is important to note that the data within this book only represents a 'snapshot' for a particular soil. It is possible that local variation may cause significant differences in any analytical property. This variation should always be considered when using this data in any detailed study. While the data in this book provides a valuable starting point, the authors strongly recommend that on-site analyses should always be used to confirm soil fertility or other attributes which may be used as a basis for economic decision-making.

2.2 Understanding the data

The methods used for soil physical and chemical analyses are detailed in Baker and Eldershaw (1993) and Rayment and Higginson (1992). Because of the age of the CSIRO samples, the analytical methods that were used may be different from those detailed in the above books. Reference should be made to Reeve *et al*. (1960) for further information concerning the CSIRO data.

Each representative profile contains data describing landform, vegetation, geology, soil classification, profile morphology and profile chemistry. The following text provides a brief description of the terminology used in each part of the representative profile descriptions.

Location:	Co-ordinate location of the described site
Site No.	Project code and site number
Landform element:	Description of the landform unit within approximately 40m diameter from the site (McDonald *et al.,* 1990).
Landform pattern:	Description of the larger landform unit within approximately 600m diameter from the site (McDonald *et al.,* 1990).
Microrelief description:	Description of the microrelief (e.g. gilgai) - from McDonald *et al.* (1990).
Permeability:	A descriptive estimate of the rate at which water moves through the profile (McDonald *et al.,* 1990).
Drainage:	A descriptive estimate of the rate at which deep drainage occurs within the profile (McDonald *et al.,* 1990).
Slope (%):	Slope of the site (within the landform element)
Substrate lithology:	Description of the substrate (not necessarily the parent material) - from McDonald *et al.* (1990).
Great Soil Group:	Classification according to Stace *et al*. (1968).
Principal Profile Form:	Classification according to Northcote (1979).
Australian Soil Classification:	Classification according to Isbell (1996)
Disturbance:	Description of the degree of disturbance at the site - from McDonald *et al.* (1990).
Surface coarse fragments:	Description of the abundance, size, shape and type of rock fragments on the soil surface (McDonald *et al.,* 1990).
Surface condition:	Description of the soil surface properties (e.g. hardsetting) - from McDonald *et al.* (1990).
Vegetation:	Description of the vegetation species and structure (where known)

Measurement	Units	Description
pH EC Cl	 dS/m %	A 1:5 soil/water mixture analysed for pH, electrical conductivity and chloride ion content
CS FS SI CL	% % % %	The relative proportions of coarse sand, fine sand (0.06-2mm), silt (0.002-0.06mm) and clay (<0.002mm) within the mineral component of a soil
CEC Ca Mg Na K	meq% meq% meq% meq% meq%	Measured using either an aqueous or alcoholic solution, depending upon the soil pH. The quantity of calcium, magnesium, sodium and potassium ions in the soil. The cation exchange capacity is typically measured separately, and depending on other soil properties, may be estimated by summing the values for the four cations. It should be noted that CEC method at pH 8.5 will overestimate CEC for acid layers.
15 BAR DR (R1)	%	An estimate of the amount of water retained by a soil when 15bars of suction is applied (using pressure plate apparatus) Dispersion ratio is the ratio of readily dispersible silt and clay determined by particle size analysis. It gives an indication of the dispersibility of soil layers.
P K S	% % %	Total quantity of each element within the soil. This is greater than the available amount. Can be used to give an estimate of the store of an element within the soil.
ESP Ca/Mg B.S Organic C Total N	% % %	The exchangeable sodium content, divided by the sum of cations (Ca, Mg, Na, K) and expressed as a percentage. Can be used to assist in estimation of soil stability, permeability and drainage. Ratio of exchangeable calcium ions to exchangeable magnesium ions. If this value is very low (<0.1), soil instability may occur (particularly if combined with a high ESP). Base status - used in the Australian Soil Classification. This refers to the sum of exchangeable basic cations (Ca, Mg, K and Na) expressed in cmol (+) kg-1 clay. Acts as a soil aggregate stabiliser thereby improving porosity. It also acts as a storehouse for macronutrients and it chelates micronutrients (Fe, Zn, Cu). Low pH and low tillage lead to organic C build-up. Total quantity of N within the soil. This is greater than the available amount. Can be used to give an estimate of the store within the soil.

Measurement	Units	Description
P – Acid	mg/kg	Both measure available P. Bic (bicarbonate extractable phosphorus) P is more
– Bic	mg/kg	reliable in soils with a pH >7.8. It is the proportion of the element that can be taken up and assimilated by plants to enhance their growth and development.
K	meq%	Available K, is the proportion of the element that can be taken up and assimilated by plants to enhance their growth and development.
Fe	mg/kg	DTPA extractable micronutrients are the proportion of the micronutrients that can be
Mn	mg/kg	taken up and assimilated by plants, as determined by the diethylenetriaminepenta-
Cu	mg/kg	acetic acid method.
Zn	mg/kg	
SO4-S	mg/kg	Sulphate sulphur, is a measure of the available sulphur in the soil.

2.2.1 Interpreting soil analyses

Section 4 of the *Resource Information Book* discusses the fertility and other chemical aspects of many of the soils. The discussion is based upon the data presented within this book. The ratings used to produce tables such as 4.6 and 4.7 within the *Resource Information Book* are reproduced below. Further information on soil analysis interpretation may be found in Baker and Eldershaw (1993) and Peverill *et al*. (1999)

Ratings as suggested by Bruce and Rayment (1982) and Hazelton and Murphy (eds) (1992) are as follows:

Table 2.2 Ratings used for interpretation of soil analyses

		Ratings				
Soil test	**Units**	**Very low**	**Low**	**Medium**	**High**	**Very high**
Cl-	(%)	<0.01	0.01-0.03	0.03-0.06	0.06-0.20	>0.20
Org. C	(%)	<0.5	0.5-1.5	1.5-2.5	2.5-5.0	>5.0
Total N	(%)	<0.05	0.05-0.15	0.15-0.25	0.25-0.5	>0.5
C/N Ratio		<8	8-10	10-15	15-25	>25
Total P	(%)	<0.005	0.005-0.02	0.02-0.05	0.05-0.10	>0.10
Total K	(%)	<0.1	0.1-0.5	0.5-1.0	1.0-3.0	>3.0
Total S	(%)	<0.005	0.005-0.02	0.02-0.05	0.05-0.10	>0.10
P_{ACID}	(mg/kg)	<10	10-20	20-40	40-100	>100
P_{BICARB}	(mg/kg)	<10	10-20	20-40	40-100	>100
Extr. K	(m.eq%)	<0.1	0.1-0.2	0.2-0.5	0.5-1.0	>1.0
Sulphur	(mg/kg)		<4	4-10	>10	
Cu	(mg/kg)	<0.1	0.1-0.3	0.3-5	5-15	>15
Zn pH >7	(mg/kg)	<0.3	0.3-0.8	0.8-5	5-15	>15
pH <7	(mg/kg)	<0.2	0.2-0.5	0.5-5	5-15	>15
Mn	(mg/kg)	<1	1-2	2-50	50-500	>500
Dispersion ratio			<0.6	0.6-0.8	>0.8	

pH

Rating	pH ($_{1:5}$)
extremely acid	<4.5
very strongly acid	4.5-5.0
strongly acid	5.1-5.5
medium acid	5.6-6.0
slightly acid	6.1-6.5
neutral	6.6-7.3
mildly alkaline	7.4-7.8
moderately alkaline	7.9-8.4

strongly alkaline	8.5-9.0
very strongly alkaline	>9.0

Electrical conductivity ($EC_{1:5}$) of the soil solution

Salinity rating	Root zone salinity ($EC_{1:5}$ dS/m)			
	10-20% clay	20-40% clay	40-60% clay	60-80% clay
very low	<0.05	<0.08	<0.12	<0.18
low	0.10	0.165	0.25	0.37
medium	0.25	0.40	0.58	0.85
high	0.45	0.67	1.00	1.5
very high	0.70	1.05	1.58	2.4
extreme	>0.70	>1.05	>1.58	>2.4

(from Shaw, 1988)

Sodicity

Sodicity rating	ESP (%)
non-sodic	<6
sodic	6-15
strongly sodic	>15

(from Northcote and Skene, 1972)

As a guide to the generalised ratings given in Table 2.2 the following statements can be made (this guide is taken from Bruce and Rayment, 1982):

- Very low or low ratings are usually undesirable for optimum crop production. When very low or low ratings for P, K and Zn are recorded, the fertiliser rate required usually equals the highest normally recommended in the district for the specific crop being grown;

- Medium ratings for P, K and Zn indicate a level of soil fertility at which only small (if any) responses to these nutrients are likely for most agricultural crops and pastures under dryland conditions. Fertiliser recommendations for P and K should be below the district average; usually no Zn would be required; and high or very high ratings indicate no fertiliser would normally be recommended for crops and pastures

These interpretations should only be used as a guide, and should always be replaced by specific site analyses when making important land use decisions.

3. Analytical data for representative soil profiles

The soil profile analytical data is arranged in alphabetic order. Table 3.1 provides the page number for each soil. Some soils have more than one analytical profile.

Table 3.1 Page numbers of representative profiles

[1] D – Depression
M – Mound
F – Farmed
V – Virgin

ABERDEEN

REPRESENTATIVE SOIL PROFILE

Location:	378517 mE 6953941 mN Zone 56	**Site No.**	EDS 555
Landform element:	Footslope	**Microrelief description:**	Absent
Landform pattern:	Undulating plain	**Permeability:**	Slowly permeable
Slope:	4%	**Drainage:**	Imperfectly drained
Great Soil Group:	Red clay	**Substrate lithology:**	Basalt
Principal Profile Form:	Ug5.13	**Surface coarse fragments:**	Absent
Australian Soil Classification:	Haplic Self-mulching, Black Vertosol	**Surface condition:**	Self-mulching, cracking
Disturbance:	Old cultivation/pasture		
Vegetation:	Cleared		

Profile Morphology:

Horizon	Depth	Description
A1	0 to 0.05 m	Dark (7.5YR 2/2) moist; light medium clay; strong 2-5mm granular; dry, very firm; field pH 8.0; abrupt to-
B21	0.05 to 0.30 m	Dark (7.5YR 2/2) moist; medium clay; strong 2-5mm angular blocky; moderately moist, very firm; field pH 9.0; clear to
B22	0.30 to 0.50 m	Dark (7.5YR 2/2) moist; medium clay; strong 10-20mm angular blocky parting to 5-10mm lenticular; moderately moist, very firm; clear to-
B23	0.50 to 0.75 m	Dark (7.5YR 2/2) moist; medium clay; strong 20-50mm parting to 5-10mm lenticular; moist, firm; field pH 9.0; clear to-
B24	0.75 to 1.00 m	Dark (5YR 2/2) moist; medium clay; strong 10-20mm parting to moderate 2-5mm lenticular; moist, firm; field pH 9.0; clear to-
B25	1.00 to 1.20 m	Red brown (5YR 3/5) moist; light medium clay; moderate 5-10mm parting to 2-5mm lenticular; moist, firm; clear to-
B3	1.20 to 1.30 m	Red brown (5YR 4/7) moist; light clay; moist, firm; few 2-6mm calcareous concretions.

Analytical data:

Depth	1:5 soil/water			Particle size %				pH 8.5 Alcoholic Cations meq%					BAR %	D.R	Total Element %					
(cm)	pH	dS/m EC	% Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	8.1	0.11	0.004	2	11	19	64	56.2	26.5	24.4	0.4	1.40	26	0.41	0.158	0.925	0.032	1	1.09	82
20-30	8.5	0.08	0.003	1	9	20	67	61.7	23.4	27.7	1.1	0.50	28	0.45	0.135	0.846	0.022	2	0.85	79
50-60	8.9	0.11	0.002	1	9	17	70	62.9	21.3	30.9	1.6	0.50	29	0.49	0.130	0.841	0.019	3	0.69	78
80-90	9.1	0.24	0.006	3	9	15	69	54.3	18.8	34.5	1.9	0.50	30	0.58	0.110	0.751	0.015	4	0.79	81
110-120	9.3	0.33	0.019	4	13	16	65	59.1	12.7	31.7	1.9	0.50	N/A	N/A	0.086	0.616	0.010	3	0.91	72

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
(cm)	pH	dS/m EC	% Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	8.2	0.14	0.010	1.9	0.20	265	177	2.70	23	22	3.0	1.0	5

Note: Total elements at 65 degrees Celsius; all other data reported at 105^{o}C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

Note: While this representative profile keys out as black (due to the colour of the upper part of the profile) the soil is more commonly red-brown in colour.

ACLAND

REPRESENTATIVE SOIL PROFILE

Location:	373400 mE 6905000 mN Zone 56	**Site No:**	MCD 9
Landform element:	Hillslope	**Microrelief description:**	Absent
Landform pattern:	Undulating rises	**Permeability:**	Moderately permeable
Slope:	6%	**Drainage:**	Moderately well drained
Great Soil Group:	Red clay	**Substrate lithology:**	Sandstone
Principal Profile Form:	Uf6.31	**Surface coarse fragments:**	Few small rounded ironstone
Australian Soil Classification:	Sodic, Eutrophic, Grey Dermosol	**Surface condition:**	Surface crust
Disturbance:	Grazing		
Vegetation:	Forest. *Casuarina cristata*, *Eucalyptus populnea,* softwood scrub		

Profile Morphology:

Horizon	Depth	Description
A1	0 to 0.10 m	Dark brown (7.5YR3/2) moist; fine sandy light clay; moderate 2-5mm polyhedral; dry, moderately weak; field pH 7; clear to-
B21t	0.10 to 0.40 m	Dark greyish brown (10YR4/2) moist; fine sandy medium clay; very few large pebbles, rounded quartz; strong 5-10mm sub-angular blocky; dry, moderately firm; field pH 7 to 8.5; clear to-
B22tk	0.40 to 0.55 m	Strong brown (7.5YR5/6) moist; strong brown (7.5YR5/6) dry; fine sandy medium clay; strong 20-50mm sub-angular blocky; common coarse 6-20mm calcareous soft segregations; dry, very firm; field pH 8.5 to 9; clear to-
B23t	0.55 to 0.90 m	Yellowish red (5YR4/6) dry; strong brown (7.5YR5/6) moist; fine sandy medium clay; strong 20-50mm angular blocky; few coarse 6-20mm calcareous soft segregations; dry, very firm; field pH 9; clear to-
B3	0.90 to 1.30 m	Light yellowish brown (2.5Y6/4) dry; light yellowish brown (2.5Y6/4) moist; light medium clay; weak 20-50mm polyhedral; dry, moderately firm; field pH 9 to 7.5; clear to-
BC	1.30 to 1.60 m	Pale yellow (2.5Y7/4) dry; dry, moderately weak; field pH 7.5 to 6.

Analytical data:

Depth	1:5 soil/water			Particle size %				pH 8.5 Alcoholic Cations meq%					BAR %	D.R	Total Element %			ESP %	Ca/Mg	B.S
(cm)	PH	dS/m EC	% Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S			
B0-10	7.8	0.16	0.003	N/A	N/A	N/A	N/A	32.0	28.0	5.2	0.2	5.90	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0-10	8.1	0.22	0.002	23	23	13	38	37.0	24.7	7.7	0.3	2.98	23	0.24	0.149	1.390	0.105	1	3.20	94
20-30	8.7	0.13	0.001	22	30	4	43	23.5	17.4	7.1	0.9	4.19	16	0.37	0.076	1.180	0.028	4	2.50	69
50-60	9.2	0.29	0.010	16	22	9	55	27.9	14.5	14.5	3.0	1.55	23	0.70	0.044	1.120	0.030	11	1.00	61
80-90	9.1	1.10	0.102	11	18	17	55	24.6	7.5	11.3	5.1	0.92	19	0.82	0.032	1.200	0.061	21	0.66	45
110-120	8.7	1.40	0.145	4	13	30	54	26.7	5.6	11.3	6.2	0.86	N/A	N/A	0.029	1.840	0.049	23	0.50	44

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
(cm)	PH	dS/m EC	% Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	7.8	0.16	0.003	7.8	0.34	179	66	6.90	32	25	2.6	8.5	8

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

Note: While this representative profile keys out as grey (due to the colour of the upper part of the profile) the soil is more commonly red-brown in colour.

ALLAN

REPRESENTATIVE SOIL PROFILE

Location:	393000 mE 6883000 mN Zone 56	**Site No:**	SRM 15
Landform element:	Hillslope (midslope)	**Microrelief Description:**	Absent
Landform pattern:	Undulating rises	**Permeability:**	Slowly permeable
Slope:	5%	**Drainage:**	Imperfectly drained
Great Soil Group:	Solodic	**Substrate lithology:**	Sandstone (arenaceous)
Principal Profile Form:	Dy2.13	**Surface coarse fragments:**	Absent
Australian Soil Classification:	Calcic, Subnatric, Brown Sodosol	**Surface condition:**	Hardsetting
Disturbance:	Grazing		
Vegetation:	Dry open forest. *Eucalyptus populnea*, *E. microcarpa*		

Profile Morphology:

Horizon	Depth	Description
A1	0 to 0.15 m	Dark yellowish brown (10YR 4/4) sandy clay loam; few medium quartz pebbles; moderate, 5-10mm, angular blocky structure; clear to-
B2tc	0.15 to 0.65 m	Yellowish brown (10YR 5/8) fine sandy medium clay; strong, 20-50mm, angular blocky structure; few manganiferous veins; gradual to-
B/Ck	0.65 to 1.10 m	Brownish yellow (10YR 6/6) clay loam, coarse sandy; massive; few manganiferous veins; common soft calcareous segregations.

Analytical data:

Depth	1:5 soil/water			Particle size %				pH 7.0 Aqueous Cations meq%					BAR %	D.R	(%)			%		
(cm)	pH	dS/m EC	% Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	6.7	0.10	0.009	43	35	3	17	7.0	3.4	2.7	0.46	0.25	5	0.62	0.031	1.070	0.016	7	1.26	40
20-30	6.7	0.07	0.004	23	34	5	36	19.0	6.5	9.6	2.3	0.21	16	0.37	0.026	0.848	0.027	12	0.67	52
50-60	9.2	0.41	0.023	28	22	5	46	32.0	15.0	12.0	5.0	0.19	15	0.67	0.027	1.070	0.042	16	1.25	70
80-90	9.0	0.58	0.063	14	19	20	43	27.0	8.3	11.0	7.0	0.22	14	0.49	0.033	1.010	0.027	26	0.75	62
100-110	9.2	0.29	0.031	N/A	N/A	N/A	N/A	18.0	5.4	8.2	4.2	0.12	N/A	N/A	N/A	N/A	N/A	23	0.66	N/A

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
(cm)	pH	dS/m EC	% Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	7.0	0.03	0.002	1.2	0.06	13	11	0.35	16	43	0.2	2.7	4

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

ANCHORFIELD

REPRESENTATIVE SOIL PROFILE

Location: 336471 mE 6931132 mN Zone 56
Site No: MCD 32
Landform element: Plain
Microrelief Description: Absent
Landform pattern: Alluvial plain
Permeability: Slowly permeable
Slope: 1.5%
Drainage: Imperfectly drained
Great Soil Group: Black earth
Substrate lithology: Alluvium
Principal Profile Form: Ug5.17
Surface coarse fragments: Absent
Australian Soil Classification: Endohypersodic, Self-mulching, Black Vertosol
Surface condition: Cracking, self-mulching
Disturbance: Cultivation
Vegetation: Cleared. *Marsilea hirsuta*

Profile Morphology:

Horizon	Depth	Description
A1	0 to 0.05 m	Black (10YR2/1) moist; heavy clay; few, medium 6-20mm angular chert pebbles; moderate 2-5mm granular; field pH 6.5; clear to-
B21	0.05 to 0.30 m	Black (10YR2/1) moist; heavy clay; moderate 10-20mm sub-angular blocky; field pH 8.5; gradual to-
B22k	0.30 to 0.80 m	Brownish black (10YR3/1) moist; heavy clay; strong 10-20mm lenticular; few, medium 6-6mm calcareous concretions; field pH 8.5; diffuse to-
B23k	0.80 to 1.10 m	Brownish black (10YR3/1) moist; heavy clay; moderate 10-20mm lenticular; few, coarse 6-20mm soft calcareous segregations, few, medium 2-6mm calcareous concretions; field pH 9.

Analytical Data:

Depth	1:5 soil/water			Particle size %				pH 7.0 Aqueous Cations meq%					BAR %	D.R	Total Element %					
(cm)	pH	dS/m EC	% Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	8.3	0.17	0.007	8	11	16	60	62.5	27.5	21.2	2.5	2.12	29	0.63	0.140	1.100	0.038	4	1.30	89
10-20	8.7	0.17	0.004	7	12	16	63	66.8	29.7	24.4	3.2	1.91	27	0.64	0.130	1.030	0.022	5	1.20	94
20-30	9.0	0.23	0.007	6	10	24	60	68.8	32.2	29.0	4.3	1.03	29	0.59	0.120	0.950	0.016	6	1.10	111
50-60	9.2	0.41	0.019	5	9	16	68	70.2	22.7	36.7	9.4	1.03	31	0.79	0.120	0.983	0.015	13	0.60	103
80-90	9.2	0.68	0.046	5	9	15	69	65.1	17.1	38.4	12.8	1.07	33	0.93	0.130	1.020	0.019	20	0.44	101
110-120	9.3	0.71	0.051	4	9	17	67	66.1	13.9	36.2	13.8	1.07	32	0.98	0.134	1.070	0.017	N/A	N/A	N/A

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
(cm)	pH	dS/m EC	% Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
0-10	8.3	0.17	0.007	2.5	0.16	591	137	2.12	16	4	1.2	0.2	19

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

ARDEN

REPRESENTATIVE SOIL PROFILE

Location:	800000 mE 6965765 mN Zone 55	**Site No:**	MWD 11
Landform element:	Plain	**Microrelief Description:**	Normal gilgai – Horizontal interval:10 m Vertical interval: 0.5 m
Landform pattern:	Level plain	**Microrelief component:**	Depression
Slope:	0%	**Permeability:**	Slowly permeable
Great Soil Group:	Red clay	**Drainage:**	Imperfectly drained
Principal Profile Form:	Ug5.38	**Substrate lithology:**	Clayey alluvium
Australian Soil Classification:	Epihypersodic, Self-mulching, Red Vertosol	**Surface coarse fragments:**	Absent
Disturbance:	Grazing	**Surface condition:**	Periodic cracking, self-mulching
Vegetation:	Tall open forest. *Acacia harpophylla*, *Casuarina cristata*		

Profile Morphology:

Horizon	Depth	Description (mound)
A1	0 to 0.04 m	Dark brown (7.5YR 3/4) moist; medium clay; strong 2-5mm granular; dry, moderately firm; few, medium 2-6mm carbonate nodules; abrupt to-
B21	0.04 to 0.28 m	Dark reddish brown (5YR 3/3) moist; heavy clay; strong 20-50mm angular blocky; dry, strong; few, 5-10 mm ferro-manganiferous nodules; clear to-
B22	0.28 to 0.71 m	Dark reddish brown (5YR 3/4) moist; heavy clay; very few small pebbles; moderate 20-50mm angular blocky; dry, very strong; few, medium 2-6mm soft carbonate segregations; few, medium 2-6mm carbonate nodules; clear to-
B23	0.71 to 0.90 m	Yellowish red (5YR 4/6) moist; heavy clay; moderate 50-100mm lenticular; dry, very strong; very few, medium 2-6mm carbonate nodules; very few, medium 2-6mm gypseous crystals; gradual to-
B24	0.90 to 1.50 m	Yellowish red (5YR 4/8) moist; heavy clay; moderate 10-20mm lenticular; dry, moderately strong.

Analytical Data: (gilgai mound)

Depth	1:5 soil/water			Particle size %				pH 8.5 Alcoholic Cations meq%					BAR %	D.R.	Total Element (%)			%		
(cm)	pH	dS/m EC	% Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	7.4	0.08	0.001	8	45	15	34	27.0	13.0	5.6	0.5	2.20	13	0.51	0.049	0.686	0.039	2	2.30	63
20-30	8.6	0.56	0.055	3	30	12	54	43.0	25.0	12.0	4.4	1.40	22	0.51	0.034	0.668	0.046	10	2.08	79
50-60	8.3	1.60	0.239	3	31	15	53	41.0	17.0	14.0	7.7	0.58	21	0.61	0.017	0.506	0.063	19	1.21	74
80-90	5.3	1.80	0.248	1	30	16	55	40.0	13.0	11.0	7.5	0.49	22	0.64	0.013	0.469	0.077	19	1.18	58
100-110	4.8	1.70	0.243	1	29	16	56	39.0	12.0	11.0	8.2	0.46	N/A	N/A	0.011	0.451	0.055	21	1.09	57

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
(cm)	pH	dS/m EC	% Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	7.5	0.19	0.006	1.8	0.19	21	17	1.80	22	58	2.3	1.1	N/A

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

AUBIGNY

REPRESENTATIVE SOIL PROFILE

Location:	357400 mE 6970400 mN Zone 56	**Site No:**	MCD 15
Landform element:	Hillslope (upper)	**Microrelief Description:**	Absent
Landform pattern:	Undulating low hills	**Permeability:**	Moderately permeable
Slope:	1%	**Drainage:**	Well drained
Great Soil Group:	Euchrozem	**Substrate lithology:**	Basalt
Principal Profile Form:	Dr4.12	**Surface coarse fragments:**	Absent
Australian Soil Classification:	Halpic, Eutrophic, Red Ferrosol	**Surface condition:**	Soft
Disturbance:	Grazing		
Vegetation:	Open woodland. *Eucalyptus populnea, Corymbia tessellaris*		

Profile Morphology:

Horizon	Depth	Description
A1	0 to 0.35 m	Dark brown (7.5YR3/3) moist, brown (7.5YR5/3) dry; clay loam; moderately moist, very weak; field pH 6; clear to-
B21	0.35 to 0.60 m	Dark brown (7.5YR3/4) moist, reddish brown (5YR4/4) moist; light medium clay; weak 10-20mm angular blocky; moist, moderately weak; field pH 6 to 6.5; gradual to-
B22	0.60 to 1.20 m	Dark reddish brown (5YR3/4) moist; medium clay; moderate 10-20mm angular blocky, moderate 20-50mm columnar; very few, medium 2-6mm calcareous crystals; moist, moderately weak; field pH 6.5 to 7.5; gradual to-
B23	1.20 to 1.40 m	Strong brown (7.5YR4/6) moist; fine sandy medium clay; strong 10-20mm angular blocky, moderate 5-10mm lenticular; moist, moderately firm; field pH 7.5; gradual to-
B24	1.40 to 1.60 m	Strong brown (7.5YR4/6) moist; fine sandy medium clay; very few medium 6-20mm angular basalt pebbles; moderate 20-50mm angular blocky; moderately moist, very firm; field pH 7.5 to 8.

Analytical data:

Depth	1:5 soil/water			Particle size				pH 8.5 Alcoholic Cations					BAR	D.R	Total Element					
		dS/m	%	%				meq%					%		%	%	%	%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
B0-10	7.5	0.14	0.003	N/A	N/A	N/A	N/A	32.0	19.0	7.4	0.2	1.10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0-10	7.0	0.05	0.001	10	10	13	48	26.7	15.4	5.4	0.2	0.63	17	0.47	0.155	0.933	0.032	1	2.80	45
20-30	6.9	0.04	0.000	5	5	9	74	39.0	19.0	7.4	0.6	0.37	26	0.24	0.138	0.758	0.023	1	2.60	37
50-60	7.5	0.05	0.001	38	38	11	36	47.3	28.4	11.6	0.5	0.25	21	0.51	0.250	1.25	0.017	1	2.44	113
80-90	8.4	0.21	0.004	26	26	6	53	44.0	34.5	13.6	0.6	0.58	26	0.67	0.128	0.801	0.012	1	2.54	93

Depth	1:5 soil/water			%		P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
		dS/m	%										
(cm)	pH	EC	Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	7.50	0.14	0.003	1.7	0.14	295	47	2.90	42	28	1.9	2.1	7

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available
Note: This profile is deeper than a normal Aubigny

BANCA

REPRESENTATIVE SOIL PROFILE

Location:	388750 mE 6870500 mN Zone 56	**Site No:**	SRM 151
Landform element:	Hillslope (midslope)	**Microrelief description:**	Absent
Landform pattern:	Undulating low hills	**Permeability:**	Moderately permeable
Slope:	6-10%	**Drainage:**	Moderately well drained
Great Soil Group:	Earthy sand	**Substrate lithology:**	Herries Adamellite
Principal Profile Form:	Uc2.21	**Surface coarse fragments:**	Rock outcrops common
Australian Soil Classification:	Bleached, Eutrophic, Yellow Kandosol	**Surface condition:**	Loose
Disturbance:	Grazing		
Vegetation:	Open forest. *Eucalyptus crebra*, *Xanthorrea* spp.		

Profile Morphology:

Horizon	Depth	Description
A1	0 to 0.10 m	Black (10YR 3/1) moist; sandy clay loam, coarse sandy; massive; very friable; clear to-
A2e	0.10 to 0.20 m	Brown (7.5YR 5/4) moist; conspicuous bleach when dry, coarse sandy clay loam; massive; very friable; gradual to-
B21	0.20 to 0.45 m	Reddish yellow (7.5YR 6/6) moist; coarse sandy clay loam; massive; very friable; gradual to-
B22	0.45 to 0.90 m	Yellowish brown (10YR 5/6) moist; coarse sandy loam; massive; very friable.

Analytical Data:

Depth	1:5 soil/water			Particle size %				pH 7.0 Aqueous Cations meq%					BAR %	D.R	Total Element (%)			%		
(cm)	pH	dS/m EC	% Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	6.2	0.26	0.001	58	19	5	18	6.0	4.6	0.6	0.1	0.33	N/A	N/A	N/A	N/A	N/A	1	7.60	31
10-20	6.3	0.18	0.001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
20-30	6.2	0.21	0.001	58	19	5	18	3.0	2.4	0.3	0.1	0.11	N/A	N/A	N/A	N/A	N/A	3	8.00	16
30-45	6.0	0.21	0.001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
45-60	6.2	0.14	0.001	53	22	4	21	6.0	4.0	1.0	0.2	0.13	N/A	N/A	N/A	N/A	N/A	3	4.00	25
60-90	6.5	0.18	0.001	53	21	5	21	6.0	4.0	1.3	0.3	0.13	N/A	N/A	N/A	N/A	N/A	4	3.10	27

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
(cm)	pH	dS/m EC	% Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
0-10	6.2	0.26	0.001	0.7	0.07	5	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

Note: This representative profile is of a heavier texture than a typical *Banca*.

BEAUARABA

REPRESENTATIVE SOIL PROFILE

Location:	373695 mE 6937750 mN Zone 56	**Site No:**	B175
Landform element:	Hillslope (upper)	**Microrelief description:**	Absent
Landform pattern:	Undulating rises	**Permeability:**	Slowly permeable
Slope:	6%	**Drainage:**	Imperfectly drained
Great Soil Group:	Black Earth (shallow)	**Substrate lithology:**	Basalt
Principal Profile Form:	Ug5.12	**Surface coarse fragments:**	Common basalt cobbles
Australian Soil Classification:	Halpic, Eutrophic, Black Dermosol	**Surface condition:**	Cracking, self-mulching
Disturbance:	Cultivation		
Vegetation:	Woodland. *Eucalyptus orgadophila*		

Profile Morphology:

Horizon	Depth	Description
A1	0 to 0.06 m	Very dark brown (10YR 2/2) moist; medium heavy clay; moderate medium granular structure; gradual to-
B21	0.06 to 0.16 m	Very dark brown and grey-brown; heavy clay; moderate coarse blocky structure;
B22	0.16 to 0.40 m	Patchy dark grey-brown and yellowish brown; heavy clay; moderate coarse blocky structure;
BC	0.40 to 0.55 m	Yellow-brown and yellow-grey clayey weathered basalt.

Analytical data:

Depth	1:5 soil/water			Particle size %				pH 7.0 Aqueous Cations meq%					BAR %	D.R	Total Element %					
(cm)	pH	dS/m EC	% Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-6	7.2	0.03	0.003	18	2	26	51	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.159	N/A	N/A	N/A	N/A	N/A
6-16	7.3	0.03	0.005	3	18	28	50	N/A	32.1	25.5	0.4	0.48	N/A	N/A	N/A	N/A	N/A	N/A	1.30	134
16-40	7.4	0.02	0.003	5	18	28	50	N/A	34.0	23.8	0.4	0.29	N/A	N/A	N/A	N/A	N/A	N/A	1.40	133
40-55	8.0	0.02	0.002	30	36	16	18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
(cm)	pH	dS/m EC	% Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
0-6	7.2	0.03	0.003	1.8	0.14	630	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

BELAHVILLE

REPRESENTATIVE SOIL PROFILE

Location:	304400 mE 7036600 mN Zone 56	**Site No:**	MCD 3
Landform element:	Plain	**Microrelief description:**	None
Landform pattern:	Alluvial plain	**Permeability:**	Slowly permeable
Slope:	2%	**Drainage:**	Moderately well drained
Great Soil Group:	Red–brown Earth	**Substrate lithology:**	Alluvium
Principal Profile Form:	Dr2.13	**Surface coarse fragments:**	Very few small sub-rounded quartz pebbles
Australian Soil Classification:	Haplic, Eutrophic, Red Chromosol	**Surface condition:**	Firm to hardsetting
Disturbance:	Cultivation		
Vegetation:	Closed Forest. *Eucalyptus populnea, Acacia omalophylla*		

Profile Morphology:

Horizon	Depth	Description
Ap11	0 to 0.10 m	Dark brown (7.5YR3/3) moist; sandy clay loam; weak 2-5mm polyhedral; dry moderately weak; field pH 6; clear to-
Ap12	0.10 to 0.15 m	Dark brown (7.5YR3/3) moist; clay loam; dry, moderately firm; field pH 6; clear to:
B21	0.15 to 0.60 m	Dark reddish brown (5YR3/3) moist; medium heavy clay; strong 10-20mm angular blocky; moderately moist, very firm; field pH 6 to 7; gradual to-
B22	0.60 to 1.00 m	Strong brown (7.5YR4/6) moist; medium heavy clay; strong 20-50mm angular blocky; few, coarse 6-20mm soft calcareous segregations; dry, very firm; field pH 7 to 8.5; gradual to-
B23	1.00 to 1.20 m	Strong brown (7.5YR4/6) moist; medium clay; strong 10-20mm angular blocky; very few, medium 2-6mm soft calcareous segregations; dry, very firm; field pH 8.5; diffuse to-
B24c	1.20 to 1.30 m	Brown (7.5YR5/4) moist; coarse sandy medium clay; moderate 5-10mm angular blocky; very few, fine <2mm manganiferous nodules; dry, very firm; field pH 8.5.

Analytical data:

Depth	1:5 soil/water			Particle size %				pH 7.0 Aqueous Cations meq%					BAR %	D.R	Total Element %	%	%	%		
(cm)	pH	dS/m EC	% Cl	CS	FS	SI	CL	ECEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	6.2	0.06	0.002	11	57	9	23	11.1	6.8	3.0	0.6	0.69	7	0.63	0.066	0.449	0.023	5	2.20	48
20-30	6.5	0.05	0.001	9	44	9	40	18.3	11.2	5.9	0.4	0.25	14	0.37	0.043	0.445	0.017	2	1.90	44
50-60	8.3	0.14	0.001	8	42	12	40	28.4	18.3	8.7	0.6	0.25	14	0.44	0.034	0.445	0.021	2	2.10	70
70-80	8.8	0.16	0.001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
100-110	8.8	0.14	0.001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
120-130	9.2	0.19	0.003	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
(cm)	pH	dS/m EC	% Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	7.3	0.10	0.002	1.2	0.09	42	29	0.71	20	38	0.8	0.5	4

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available
Note: It is likely that this soil is a Sodosol rather than a Chromosol.

BINKEY

REPRESENTATIVE SOIL PROFILE

Location:	291150 mE 6975550 mN Zone 56	**Site No:**	MWD 106
Landform element:	Plain	**Microrelief description:**	Absent
Landform pattern:	Plain	**Permeability:**	Slowly permeable
Slope:	1-2%	**Drainage:**	Poorly drained
Great Soil Group:	Soloth	**Substrate lithology:**	Sandstone
Principal Profile Form:	Dy2.41	**Surface coarse fragments:**	Absent
Australian Soil Classification:	Bleached, Natric, Brown Kurosol	**Surface condition:**	Hardsetting
Disturbance:	Grazing		
Vegetation:	Open forest. *Callitris glaucophylla*, *Allocasuarina luehmannii*, *Eucalyptus crebra*, *Angophora leiocarpa*		

Profile Morphology:

Horizon	Depth	Description
A1	0.00 to 0.20 m	Yellowish brown (10YR 5/4) moist; loamy sand; few 2-6mm sub-rounded gravel; massive; dry, firm; clear to-
A2e	0.20 to 0.40 m	Yellowish brown; conspicuously bleached; loamy sand; common 2-6mm ironstone and quartz gravel; massive; dry, firm; clear to-
B21t	0.40 to 0.60 m	Yellowish brown (10YR 5/4) moist; medium clay; strong coarse 10-20mm columnar; dry, strong; gradual to-
B22t	0.60 to 1.00 m	Strong brown (7.5YR 4/6) moist; medium clay; massive; dry, very strong.

Analytical Data:

Depth	1:5 soil/water			Particle size				pH 7.0 Aqueous Cations					BAR	D.R	Total Element					
		dS/m	%		%			meq%					%		(%)			%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-45	4.6	0.05	0.003	69	18	5	8	4.0	NA	NA	<0.1	<0.1	NA	NA	NA	NA	NA	2	N/A	N/A
45-60	5.3	0.12	0.014	27	18	3	51	11.0	NA	NA	1.2	<0.1	NA	NA	NA	NA	NA	11	N/A	N/A
60-90	4.9	0.23	0.024	27	16	6	51	16.0	NA	NA	2.8	<0.1	NA	NA	NA	NA	NA	18	N/A	N/A

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
		dS/m	%										
(cm)	pH	EC	Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	N/A	N/A	N/A	0.2	0.03	N/A	7	NA	NA	NA	NA	NA	N/A

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

BRAEMAR

REPRESENTATIVE SOIL PROFILE

Location:	287450 mE 7030750 mN Zone 56	**Site No:**	MCD 10
Landform element:	Plain	**Microrelief description:**	Absent
Landform pattern:	Gently undulating plain	**Permeability:**	Slowly permeable
Slope:	1%	**Drainage:**	Poorly drained
Great Soil Group:	Soloth	**Substrate lithology:**	Sandstone (arenaceous)
Principal Profile Form:	Dy2.41	**Surface coarse fragments:**	Absent
Australian Soil Classification:	Eutrophic, Hypernatric, Brown Sodosol	**Surface condition:**	Hardsetting
Disturbance:	Grazing		
Vegetation:	Open forest. *Callitris glaucophylla*, *Allocasuarina luehmannii*, *Eucalyptus populnea*		

Profile Morphology:

Horizon	Depth	Description
A11	0 to 0.05 m	Very dark greyish brown (10YR 3/2) moist; sandy loam; massive; dry, weak; clear to-
A12	0.05 to 0.15 m	Greyish brown (10YR 5/2) moist; sandy loam; massive; dry, weak; clear to-
A2e	0.15 to 0.30 m	Brown (10YR 5/3) moist, light grey (10YR 7/2) dry, sandy loam; massive; dry, weak; sharp to-
B21t	0.30 to 0.60 m	Brown (10YR 5/3) moist; light clay sandy; strong >100 mm columnar; dry, strong; clear to-
B22t	0.60 to 1.20 m	Greyish brown (10YR 5/2) moist; many faint fine mottles (yellow, grey); light clay sandy; massive; dry, strong.

Analytical Data:

Depth	1:5 soil/water			Particle size				pH 7.0 Aqueous Cations					BAR	D.R	Total Element					
		dS/m	%	%				meq%					%		(%)			%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	5.4	0.13	0.012	13	55	13	24	6.0	1.7	2.7	0.7	0.48	5	0.46	0.023	0.261	0.042	11	0.63	23
20-30	6.0	0.02	0.001	16	71	5	11	1.0	0.1	0.7	0.4	0.13	1	NA	0.012	0.242	0.027	38	0.10	12
50-60	6.6	0.45	0.054	11	51	11	32	12.0	0.1	6.4	5.5	0.28	9	0.92	0.014	0.403	0.041	46	0.02	38
80-90	6.3	0.51	0.063	6	56	18	25	11.0	0.1	5.1	5.3	0.24	17	0.96	0.015	0.603	0.039	48	0.02	43
110-120	4.9	1.50	0.109	19	44	7	32	16.0	0.2	5.9	9.5	0.21	N/A	N/A	0.012	0.201	0.048	59	0.03	49
140-150	5.0	2.2.	0.110	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
		dS/m	%										
(cm)	pH	EC	Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	5.6	0.15	0.014	2.7	0.13	N/A	6	0.41	233	16	0.1	0.9	N/A

Note: Total elements at 65 degrees Celsius; all other data reported at 105^{o}C
* -1500kPa (-15 bar) using pressure plate apparatus
B refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

BURTON

REPRESENTATIVE SOIL PROFILE

Location:	376350 mE 6953365 mN Zone 56	**Site No:**	EDS 556
Landform element:	Hillslope	**Microrelief description:**	Absent
Landform pattern:	Gently undulating plain	**Permeability:**	Highly permeable
Slope:	3%	**Drainage:**	Well drained
Great Soil Group:	Euchrozem	**Substrate lithology:**	Basaltic tephra
Principal Profile Form:	Uf6.31	**Surface coarse fragments:**	Absent
Australian Soil Classification:	Vertic, Eutrophic, Red Ferrosol	**Surface condition:**	Soft
Disturbance:	Cultivation		
Vegetation:	Cleared		

Profile Morphology:

Horizon	Depth	description
A1	0 to 0.05 m	Red brown (5YR 2/3) moist; light clay; strong < 2mm granular; dry, firm; field pH 6.0; abrupt to-
B1	0.05 to 0.20 m	Red (2.5 YR 2/3) moist; light medium clay; strong 5-10mm parting to < 2mm sub-angular blocky; dry, firm; clear to-
B2t	0.20 to 1.10 m	Red (2.5YR 2/4) moist; medium clay; strong 2-5mm angular blocky parting to <2mm lenticular; moderately moist, firm; field pH 6.5 to 7.5; clear to-
B3	1.10 to 1.20 m	Red (2.5YR 2/4) moist; medium clay; common 6-20mm scoria; strong 2-5mm angular blocky parting to <2mm lenticular; moderately moist, firm; field pH 7.5

Analytical data:

Depth	1:5 soil/water			Particle size				pH 8.5 Alcoholic Cations					BAR	D.R	Total Element					
		dS/m	%	%				meq%					%		%			%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	6.7	0.04	0.001	2	16	20	61	40.6	9.6	6.7	0.0	3.20	19	0.37	0.149	0.908	0.036	<1	1.26	36
20-30	7.2	0.03	0.001	1	7	15	77	44.2	12.6	7.4	0.1	0.90	27	0.22	0.109	0.655	0.029	<1	1.62	28
50-60	7.6	0.03	0.001	1	6	8	84	41.1	13.7	10.2	0.3	0.40	29	0.26	0.090	0.573	0.020	1	1.28	29
80-90	7.8	0.03	0.001	1	6	13	79	80.3	15.8	11.6	0.4	0.50	28	0.65	0.086	0.623	0.013	1	1.30	36

Depth	1:5 soil/water			%	%	mg/kg		meq%	DTPA extract. mg/kg				mg/kg
	dS/m		%										
(cm)	pH	EC	Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	6.9	0.08	0.003	2.0	0.20	57	66	2.60	48	74	4.0	1.0	15

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

CALINGUNEE

REPRESENTATIVE SOIL PROFILE

Location:	257200 mE 6894500 mN Zone 56	**Site No:**	WLM 20
Landform element:	Hillslope	**Microrelief description:**	Gilgai
Landform pattern:	Gently undulating to undulating rises	**Microrelief component:**	Shelf
Slope:	2%	**Permeability:**	Slowly permeable
Great Soil Group:	Grey clay	**Drainage:**	Imperfectly drained
Principal Profile Form:	Ug5.16	**Substrate lithology:**	Labile sedimentary rocks
Australian Soil Classification:	Epihypersodic-Endoacidic, Self-mulching, Grey Vertosol	**Surface coarse fragments:**	Few coarse pebbles
Disturbance:	Grazing	**Surface condition:**	Periodic cracking; weakly to moderately self mulching on mounds and in depressions with a weak surface flake after rain; firm to hardsetting where water ponds
Vegetation:	Tall open forest. *Acacia harpophylla* with *Casuarina cristata* and occasional *Eucalyptus populnea*, with an understorey of shrubs.		

Profile Morphology:

Horizon	Depth	Description
A11	0 to 0.05 m	Brownish black (10YR3/2) moist; medium clay; strong 2-5mm angular blocky, parting to strong <2mm granular; dry, moderately weak; abrupt to-
A12	0.05 to 0.20 m	Brownish black (10YR3/1) moist; medium heavy clay; few angular quartz coarse pebbles, very few, angular sandstone coarse pebbles; strong 20-50mm angular blocky; moist, moderately weak; clear to-
B21k	0.20 to 0.60 m	Greyish yellow-brown (10YR4/2) moist; medium heavy clay; few, angular quartz coarse pebbles; strong 20-50mm angular blocky; dry, moderately firm; common medium 2-6mm soft carbonate segregations; diffuse to-
B22	0.60 to 1.50 m	Brown (7.5YR4/3) moist; medium heavy clay; very few angular quartz coarse pebbles; moderate 100-200mm lenticular parting to moderate 50-100mm polyhedral, parting to moderate 10-20mm lenticular; dry, very firm.

Analytical Data:

Depth	1:5 soil/water			Particle size %				pH 7.0 Aqueous Cations meq%					BAR %	D.R	Total Element (%)			%		
(cm)	pH	dS/m EC	% Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
10	6.9	0.07	0.001	30	24	12	33	29.0	17.0	4.4	0.2	0.45	13	0.32	0.065	0.571	0.050	1	3.86	67
30	9.1	0.30	0.007	21	20	8	50	35.0	24.0	11.0	<0.1	0.73	20	0.80	0.033	0.388	0.026	<1	2.18	72
60	8.9	0.54	0.048	21	18	8	50	30.0	12.0	11.0	7.6	0.33	20	0.94	0.023	0.370	0.023	25	1.09	62
90	5.4	0.88	0.139	17	17	9	56	33.0	6.8	9.2	8.4	0.30	20	0.94	0.021	0.370	0.018	25	0.74	44
120	4.9	0.80	0.128	21	19	11	49	3.0	4.6	8.1	7.2	0.34	N/A	N/A	0.018	0.377	0.013	24	0.57	41

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
(cm)	pH	dS/m EC	% Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	7.4	0.08	0.002	1.7	0.18	26	18	0.82	33	31	1.0	1.0	N/A

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

CECILVALE

REPRESENTATIVE SOIL PROFILE

Location:	269250 mE 7029650 mN Zone 56	**Site No:**	MCD 26
Landform element:	Plain	**Microrelief description:**	Crabhole gilgai
Landform pattern:	Alluvial plain	**Microrelief component:**	
Slope:	<1%	**Permeability:**	Very slowly permeable
Great Soil Group:	Grey clay	**Drainage:**	Imperfectly drained
Principal Profile Form:	Ug5.28	**Substrate lithology:**	Alluvium
Australian Soil Classification:	Endohypersodic, Epipedal, Grey Vertosol	**Surface coarse fragments:**	Absent
Disturbance:	Grazing	**Surface condition:**	Weakly self-mulching, cracking
Vegetation:	Woodland. *Eucalyptus populnea*, *Acacia salicina*, *Santalum lanceolatum*, *Geijera parviflora*, *Eremocitrus glauca*		

Profile Morphology:

Horizon	Depth	Description (mound)
A11	0 to 0.02 m	Dark greyish brown (10YR 4/2) moist; light clay; moderate 2-5mm granular; dry, weak; sharp to-
B21c	0.02 to 0.10 m	Dark greyish brown (10YR 4/2) moist; light medium clay; strong 5-20mm angular blocky; dry, strong; very few 2-6mm ferro-manganiferous nodules; clear to-
B22	0.10 to 0.25 m	Dark greyish brown (2.5YR 4/2) moist; medium clay; strong 20-50mm angular blocky; dry, strong; very few, soft calcareous segregations; very few 2-6mm ferro-manganiferous nodules; clear to-
B23k	0.25 to 0.65 m	Greyish brown (2.5YR 5/2) moist; medium heavy clay; strong 50-100mm angular blocky, parting to 20-50 mm; dry, strong; common 6-20mm soft calcareous segregations; very few 6-20mm calcareous nodules; very few 2-6mm ferro-manganiferous nodules; clear to-
B24	0.65 to 1.20 m	Dark greyish brown (2.5YR 4/2) moist; medium heavy clay; moderate 100-200mm sub-angular blocky, parting to 50-100mm; dry, strong; few 2-6mm soft calcareous segregations/nodules; very few 2-6mm ferro-manganiferous nodules; gradual to-
B25	1.20 to 1.50 m	Dark greyish brown (10YR 4/2) moist; medium heavy clay; weak 50-100mm sub-angular blocky.

Analytical Data (gilgai mound)

Depth	1:5 soil/water			Particle size				pH 8.5 Alcoholic Cations					BAR	D.R	Total Element					
		dS/m	%	%				meq%					%		(%)			%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	7.4	0.06	0.001	20	45	11	27	24.0	13.0	5.9	0.6	0.57	12	0.38	0.046	0.400	0.051	3	2.20	74
20-30	9.1	0.23	0.003	20	36	7	40	30.0	16.0	8.7	2.9	0.26	17	0.48	0.031	0.316	0.039	10	1.83	70
50-60	9.2	0.73	0.068	20	35	10	38	29.0	10.0	12.0	6.0	0.26	16	0.76	0.023	0.279	0.051	21	0.83	74
80-90	9.0	0.98	0.088	20	34	12	36	29.0	11.0	11.0	6.1	0.20	16	0.75	0.021	0.342	0.064	21	1.00	79
110-120	8.7	1.30	0.091	18	31	9	44	34.0	11.0	14.0	7.0	0.26	N/A	N/A	0.023	0.462	0.047	21	0.78	73
140-150	8.0	0.90	0.094	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
(cm)	pH	dS/m EC	% Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	7.3	0.05	0.001	1.3	0.10	N/A	12	0.61	20	18	0.8	0.3	N/A

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

CECILVALE

REPRESENTATIVE SOIL PROFILE

Location: 337500 mE 6981500 mN$. Zone 56
Site No: WHE 7
Landform element: Plain
Microrelief description: Absent
Landform pattern: Alluvial plain
Permeability: Very slowly permeable
Slope: 0.5%
Drainage: Imperfectly drained
Great Soil Group: Grey clay
Substrate lithology: Alluvium
Principal Profile Form: Ug5.26
Surface coarse fragments: Absent
Australian Soil Classification: Endohypersodic, Crusty, Grey Vertosol
Surface condition: Crusting to hardsetting, periodic cracking
Disturbance: Cultivation
Vegetation: Open woodland. *Eucalyptus populnea* (in uncleared areas)

Profile Morphology:

Horizon	Depth	Description
Ap	0 to 0.10 m	Brownish grey (10YR5/1) moist; light medium clay; moderate 20-50mm fragment; very few medium 2-6mm calcareous nodules; dry, very firm; field pH 9; clear to-
B21k	0.10 to 0.60 m	Brownish grey (10YR5/1) moist; medium clay; moderate 50-100mm angular blocky; many, coarse 6-20mm soft calcareous segregations; moist, moderately weak; field pH 9; clear to-
B22k	0.60 to 1.40 m	Brownish grey (10YR5/1) moist; medium heavy clay; moderate 5-10mm lenticular, moderate 20-50mm lenticular; many coarse 6-20mm calcareous nodules, very few, medium 2-6mm calcareous nodules; moist, moderately weak; field pH 9;
B23	1.40 to 1.70 m	Greyish yellow-brown (10YR5/2) moist; few medium prominent brown mottles; fine sandy light medium clay; strong 20-50mm prismatic parting to strong 10-20mm lenticular.

Analytical data:

Depth	1:5 soil/water			Particle size				pH 8.5 Alcoholic Cations					BAR	D.R	Total Element					
		dS/m	%	%				meq%					%		%	%	%	%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
B0-10	7.10	0.15	0.002	12	40	11	39	29.6	14.8	7.6	0.8	0.85	N/A	N/A	0.060	0.410	0.030	3	2.00	61
10-20	8.30	0.18	0.007	10	35	9	42	37.2	16.5	13.4	2.7	0.50	18	0.67	N/A	N/A	N/A	7	1.20	79
20-30	8.50	0.23	0.009	10	32	8	46	38.2	14.5	15.5	3.8	0.42	20	0.72	N/A	N/A	N/A	10	0.90	74
50-60	9.00	0.63	0.039	9	26	10	49	43.6	12.4	18.7	7.7	0.44	20	0.97	N/A	N/A	N/A	18	0.70	80
80-90	8.80	1.15	0.108	7	21	11	56	43.6	13.5	19.7	8.5	0.61	22	0.86	N/A	N/A	N/A	20	0.68	76
110-120	8.60	1.35	0.148	5	22	12	55	43.6	12.5	19.7	8.8	0.74	22	0.85	N/A	N/A	N/A	20	0.63	76
140-150	8.60	1.26	0.142	2	30	10	57	40.5	10.2	18.7	8.7	0.74	22	0.84	N/A	N/A	N/A	22	0.54	67

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
		dS/m	%										
(cm)	pH	EC	Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	7.10	0.15	0.002	1.0	0.05	102	50	0.75	27	25	2.4	0.5	N/A

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

$ approximate position only

CHANNING

REPRESENTATIVE SOIL PROFILE

Location:	224800 mE 7048080 mN Zone 56	**Site No:**	MWD 27
Landform element:	Hillslope	**Microrelief description:**	Absent
Landform pattern:	Undulating rises	**Permeability:**	Slowly permeable
Slope:	3%	**Drainage:**	Poorly drained
Great Soil Group:	Soloth	**Substrate lithology:**	Sandstone
Principal Profile Form:	Dr2.41	**Surface coarse fragments:**	Absent
Australian Soil Classification:	Bleached-Sodic, Magnesic-Natric, Red Kurosol	**Surface condition:**	Hardsetting
Disturbance:	Grazing		
Vegetation:	Open forest. *Eucalyptus fibrosa* subsp. *fibrosa*, *Callitris glaucophylla*, *Eucalyptus crebra*, *Acacia* spp.		

Profile Morphology

Horizon	Depth	Description
A1	0 to 0.10 m	Brown (7.5YR 4/4) moist, sandy loam; massive; dry, weak; abrupt to-
A2e	0.10 to 0.15 m	Brown (7.5YR 4/4) moist, very pale brown (10YR 7/4) dry, sandy loam; massive; dry, weak; sharp to-
B21t	0.15 to 0.40 m	Reddish brown (5YR 4/4) moist, medium clay; strong 20-50mm angular blocky; dry, strong; gradual to-
B22t	0.40 to 0.80 m	Brown (7.5YR 4/4) moist, few faint grey mottles, medium clay; weak angular blocky to massive; few 6-20mm coarse gravel fragments; gradual to-
B23t	0.80 to 1.20 m	Brown (7.5YR 4/4) moist, common faint grey and orange mottles, medium clay; massive; dry, very strong.

Analytical Data:

Depth	1:5 soil/water			Particle size %				pH 7.0 Aqueous Cations meq%					BAR %	D.R	Total Element (%)			%		
(cm)	pH	dS/m EC	% Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	5.3	0.03	0.001	26	52	11	17	4.0	0.6	1.6	0.3	0.27	6	0.55	0.031	1.070	0.016	8	0.39	17
20-30	5.1	0.22	0.028	32	62	4	7	13.0	0.7	7.5	2.9	0.20	13	N/A	0.026	0.848	0.027	22	0.09	161
50-60	4.6	0.85	0.121	22	40	6	34	14.0	0.5	6.6	5.9	0.18	12	0.82	0.027	1.070	0.042	42	0.07	39
80-90	4.3	1.30	0.168	26	37	6	30	16.0	0.3	6.9	7.5	0.19	12	0.79	0.033	1.010	0.027	47	0.04	50
110-120	4.4	1.10	0.150	17	35	9	38	17.0	0.3	7.5	7.9	0.27	N/A	N/A	N/A	N/A	N/A	46	0.03	42
140-150	4.5	0.83	0.116	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
(cm)	pH	dS/m EC	% Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	5.5	0.03	0.002	0.39	0.03	N/A	3	0.16	33	9.5	0.16	0.22	N/A

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

CHARLTON

REPRESENTATIVE SOIL PROFILE

Location:	385209mE 6955242mN Zone 56	**Site No:**	EDS 561
Landform element:	Hillslope	**Microrelief description:**	Absent
Landform pattern:	Undulating rises	**Permeability:**	Slowly permeable
Slope:	6%	**Drainage:**	Imperfectly drained
Great Soil Group:	Black Earth	**Substrate lithology:**	Basalt
Principal Profile Form:	Ug5.12	**Surface coarse fragments:**	Absent
Australian Soil Classification:	Haplic, Self-mulching, Black Vertosol	**Surface condition:**	Self-mulching, cracking
Disturbance:	Grazing		
Vegetation:	Open woodland. *Eucalyptus orgadophila*, *Dichanthium sericeum*		

Profile Morphology:

Horizon	Depth	Description
A1	0 to 0.03 m	Dark (10YR 2/1) moist; light medium clay; strong 5-10mm parting to 2-5mm sub-blocky; dry, very firm; field pH 7.0; abrupt to-
B1	0.03 to 0.10 m	Dark (10YR 2/1) moist; medium clay; strong 10-20mm sub-angular blocky parting to 2-5mm angular blocky; moderately moist, very firm; clear to-
B21	0.10 to 0.25 m	Dark (10YR 1/1) moist; medium heavy clay; strong 10-20mm parting to 2-5mm angular-blocky; moderately moist, very firm; clear to-
B22	0.25 to 0.60 m	Dark (10 YR 1/1) moist; medium heavy clay; strong 10-20mm parting to 5-10mm lenticular; moderately moist, very firm; abrupt to-
B3	0.60 to 0.65 m	Dark (10YR 2/1) moist; medium clay; few 6-20mm sub-angular and common 2-6mm sub-angular basaltic fragments; field pH 8.5; abrupt to-
C	0.65 m +	Vesicular basalt.

Analytical data:

Depth	1:5 soil/water			Particle size				pH 8.5 Alcoholic Cations					BAR	D.R	Total Element					
		dS/m	%	%				meq%					%		%			%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	7.4	0.08	0.004	4	21	21	52	73.5	30.3	33.5	0.8	1.5	34	0.44	0.127	0.923	0.039	1	0.82	128
20-30	8.6	0.14	0.011	4	13	19	63	77.2	34.8	38.1	2.6	0.6	35	0.51	0.101	0.805	0.024	4	0.82	119
50-60	8.7	0.37	0.045	2	10	15	71	80.4	34.8	39.1	3.3	0.5	34	0.53	0.108	0.850	0.020	4	0.80	112

Depth	1:5 soil/water			%	%	mg/kg		meq%	DTPA extract. mg/kg				mg/kg
		dS/m	%										
(cm)	pH	EC	Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	7.5	0.10	0.004	2.9	0.22	321	66	1.00	64	42	4.0	1.0	8

Note: Total elements at 65 degrees Celsius; all other data reported at 105oC
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

CHINCHILLA

REPRESENTATIVE SOIL PROFILE

Location:	278900 mE 7044700 mN Zone 56	**Site No:**	MWD 10
Landform element:	Plain	**Microrelief description:**	Absent
Landform pattern:	Alluvial plain	**Permeability:**	Highly permeable
Slope:	2%	**Drainage:**	Very well drained
Great Soil Group:	Siliceous sand	**Substrate lithology:**	Sandstone alluvium
Principal Profile Form:	Uc1.22	**Surface coarse fragments:**	Absent
Australian Soil Classification:	Basic, Arenic, Orthic Tenosol	**Surface condition:**	Loose
Disturbance:	Grazing		
Vegetation:	Woodland. *Eucalyptus tesselaris*, *Angophora floribunda*		

Profile Morphology:

Horizon	Depth	Description
A11	0 to 0.30 m	Strong brown (7.5YR 4/6) moist; sandy loam; massive; dry, weak; clear to-
B21	0.30 to 0.80 m	Yellowish red (5YR 5/8) moist; clayey sand; massive; dry, very weak; diffuse to-
B22	0.80 to 1.60 m	Red (2.5YR 4/8) moist; loamy sand; massive; dry, very weak.

Analytical Data:

Depth	1:5 soil/water			Particle size				pH 7.0 Aqueous Cations					BAR	D.R	Total Element					
		dS/m	%	%				meq%					%		(%)			%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	6.9	0.02	0.001	36	55	7	8	7.0	2.9	0.9	0.1	0.22	2	0.10	0.041	0.216	0.036	2	3.30	51
20-30	7.1	0.01	0.001	37	55	3	6	2.0	1.1	0.5	0.1	0.21	2	0.10	0.034	0.213	0.026	5	2.20	31
50-60	6.2	0.01	0.001	34	57	2	7	1.0	0.6	0.5	0.1	0.17	2	0.10	0.037	0.213	0.025	5	1.06	18
80-90	5.6	0.01	0.001	31	60	3	5	1.0	0.6	0.3	<0.1	0.13	2	0.10	0.037	0.220	0.025	4	1.93	20
110-120	5.5	0.01	0.001	30	59	5	4	1.0	0.7	0.3	0.1	0.12	N/A	N/A	N/A	N/A	N/A	6	2.12	30
140-150	5.5	0.01	0.001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
		dS/m	%										
(cm)	pH	EC	Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	6.7	0.03	0.001	1.0	0.06	N/A	20	0.25	17	12	0.2	1.3	N/A

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

CLAYBURN

REPRESENTATIVE SOIL PROFILE

Location:	314900 mE 7048600 mN Zone 56	**Site No:**	MCD 4
Landform element:	Hillslope	**Microrelief description:**	Normal gilgai; Horizontal interval 10m; Vertical interval 0.4m
Landform pattern:	Undulating rises	**Microrelief component:**	Depression
Slope:	1-4%	**Permeability:**	Slowly permeable (depression) Moderately permeable (mound)
Great Soil Group:	No suitable group	**Drainage:**	Poorly drained (depression) Imperfectly drained (mound)
Principal Profile Form:	Dd2.23	**Substrate lithology:**	Sandstone
Australian Soil Classification:	Halpic, Eutrophic, Grey Kandosol over Black Vertosol	**Surface coarse fragments:**	Absent
Disturbance:	Cultivation	**Surface condition:**	Hardsetting
Vegetation:	Open forest. *Eucalyptus moluccana, Acacia harpophylla, Casuarina cristata, Melaleuca bracteata, Geijera parviflora*		

Profile Morphology:

Horizon	Depth	Description
A1	0 to 0.20 m	Very dark brown (10YR2/2) moist; brown (7.5YR4/4) dry; few fine distinct orange mottles; clay loam; fine sandy; weak 2-5mm polyhedral; dry moderately weak; field pH 5.5 to 5.8; clear to-
A2	0.20 to 0.30 m	Brown (7.5YR5/2) moist; clay loam; fine sandy; weak 5-10mm polyhedral; dry moderately weak; field pH 5.8; sharp to-
2A1b	0.30 to 0.70 m	Very dark grey (10YR3/1) moist; common fine distinct orange mottles; fine sandy medium heavy clay; very few medium 6-20mm rounded quartz pebbles; moderate 20-50mm polyhedral; dry moderately firm; field pH 5.8 to 7.5; clear to-
2B2bt	0.70 to 1.40 m	Dark yellowish brown (10YR4/6) moist; common medium distinct grey mottles; few medium 6-20mm rounded quartz pebbles; moderate 20-50mm sub-angular blocky; few, coarse 6-20mm calcareous nodules, few, medium 2-6mm soft calcareous segregations; dry very firm; field pH 7.5 to 8.5.

Analytical data:

Depth	1:5 soil/water			Particle size				pH 7.0 Aqueous Cations					BAR	D.R	Total Element					
		dS/m	%	%				meq%					%		%	%	%	%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	ECEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	6.1	0.09	0.004	6	39	15	38	19.6	11.5	5.7	0.3	1.96	18	0.23	0.127	0.614	0.088	2	2.00	51
20-30	6.3	0.04	0.001	3	71	4	23	10.1	6.2	2.5	0.1	0.87	7	0.16	0.069	0.348	0.031	1	2.50	42
30-40	7.0	0.07	0.002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
50-60	7.7	0.07	0.002	8	34	8	51	26.6	16.1	9.1	0.9	0.61	19	0.43	0.042	0.553	0.028	3	1.76	52
80-90	8.2	0.12	0.004	9	37	5	50	24.5	15.0	7.6	1.6	0.46	19	0.57	0.029	0.495	0.027	7	1.99	49
110-120	9.1	0.29	0.014	12	39	7	44	35.7	23.5	9.4	2.7	0.34	N/A	N/A	0.022	0.458	0.016	8	2.51	82

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
		dS/m	%										
(cm)	pH	EC	Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	6.2	0.06	0.003	2.6	0.22	35	23	1.60	140	21	0.7	5.2	8

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

COMBIDIBAN

REPRESENTATIVE SOIL PROFILE

Location: 213550 mE 7013450 mN Zone 56
Site No: MWD 13
Landform element: Backplain
Microrelief description: Absent
Landform pattern: Alluvial plain
Permeability: Moderately permeable
Slope: 0%
Drainage: Imperfectly drained
Great Soil Group: Soloth
Substrate lithology: Sandstone
Principal Profile Form: Dy5.42
Surface coarse fragments: Absent
Australian Soil Classification: Bleached-Mottled, Eutrophic, Grey Chromosol
Surface condition: Soft
Disturbance: Cleared
Vegetation: Cleared formerly *Callitris glaucophylla*, *Corymbia tessellaris*

Profile Morphology:

Horizon	Depth	Description
A11	0 to 0.10 m	Dark greyish brown (10YR 4/2) moist; sandy loam; massive; dry, firm; clear to-
A12	0.10 to 0.65 m	Dark yellowish brown (10YR 3/4) moist, brown (10YR 5/3) dry, clayey sand; massive; dry, weak; clear to-
A21e	0.65 to 0.75 m	Brown (10YR 4/3) moist, light brownish grey (10YR 6/2) dry, loamy sand; massive; dry, firm; abrupt to-
A22ec	0.75 to 0.85 m	Brown (10YR 4/3) moist, light brownish grey (10YR 6/2) dry, loamy sand; massive; dry, firm; very many 10-20mm ferro-manganiferous nodules; sharp to-
B21t	0.85 to 1.20 m	Dark greyish brown (10YR 4/2) moist; light medium clay, coarse sandy; many distinct red (5YR4/6) mottles; strong 50-100mm columnar (domed), parting to 20-50mm prismatic; gradual to-
B22t	1.20 to1.60 m	Dark greyish brown (10YR 4/2) moist; light medium clay, coarse sandy; many distinct red (5YR4/6) mottles; moderate 20-50mm prismatic.

Analytical Data:

Depth	1:5 soil/water			Particle size				pH 7.0 Aqueous Cations					BAR	D.R	Total Element					
		dS/m	%	%				meq%					%		(%)			%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	6.6	0.02	0.001	39	45	4	11	3.0	2.1	0.8	0.1	0.33	3	NA	0.033	0.698	0.031	3	2.53	30
20-30	6.5	0.01	0.001	39	48	1	11	2.0	1.4	0.4	0.1	0.18	2	NA	0.024	0.661	0.024	4	3.41	19
50-60	6.4	0.01	0.001	44	47	1	11	2.0	1.5	0.3	0.1	0.30	2	NA	0.030	0.716	0.026	3	4.54	20
80-90	7.1	0.05	0.003	25	29	1	46	18.0	9.2	7.2	1.0	0.48	23	0.91	0.034	0.816	0.027	5	1.27	39
110-120	7.0	0.06	0.005	24	31	1	46	19.0	9.2	8.0	1.1	0.65	N/A	N/A	0.038	0.810	0.030	6	1.15	41
140-150	6.8	0.09	0.011	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
		dS/m	%										
(cm)	pH	EC	Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	5.7	0.03	0.001	0.5	0.02	N/A	25	0.32	22	12	0.2	0.7	N/A

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

CONDAMINE

REPRESENTATIVE SOIL PROFILE

Location:	292250 mE 7014700 mN Zone 56	**Site No:**	SPFD 41
Landform element:	Plain	**Microrelief description:**	Absent
Landform pattern:	Alluvial plain	**Permeability:**	Slowly permeable
Slope:	0.5%	**Drainage:**	Imperfectly drained
Great Soil Group:	Black earth	**Substrate lithology:**	Alluvium
Principal Profile Form:	Ug5.13	**Surface coarse fragments:**	Absent
Australian Soil Classification:	Haplic, Self-mulching, Black Vertosol	**Surface condition:**	Cracking, self-mulching
Disturbance:	Cultivation		
Vegetation:	Woodland. *Eucalyptus populnea*, *Eucalyptus tereticornis*, *Geijera parviflora*, and *Acacia pendula*		

Profile Morphology:

Horizon	Depth	Description
A1	0 to 0.02 m	Brownish grey (10YR4/1) moist; medium heavy clay; strong 2-5mm granular; field pH 8; sharp to-
A12	0.02 to 0.15 m	Brownish grey (10YR4/1) moist; heavy clay; strong 100-200mm prismatic; dry, very strong; field pH 9; abrupt to-
B21	0.15 to 0.30 m	Black (10YR2/1) moist; heavy clay; strong 20-50mm angular blocky; clear to-
B22	0.30 to 0.60 m	Black (10YR2/1) moist; heavy clay; strong 20-50mm lenticular; field pH 8; gradual to-
B23	0.60 to 1.00 m	Brownish grey (10YR4/1) moist; heavy clay; strong 20-50mm angular blocky; very few, coarse 6-20mm calcareous nodules; field pH 8.5; gradual to-
B24	1.00 to 1.40 m	Greyish yellow-brown (10YR5/2) moist; medium heavy clay; strong 50-100mm lenticular, strong 10-20mm angular blocky; very few, medium 2-6mm calcareous nodules; moderately moist, very firm; field pH 8.5.

Analytical Data:

Depth	1:5 soil/water			Particle size %				pH 8.5 Alcoholic Cations meq%					BAR %	D.R	Total Element %					
(cm)	pH	dS/m EC	% Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	7.5	0.09	0.002	6	14	9	69	47.0	29.0	16.0	1.4	0.60	29	0.65	0.062	1.100	0.018	3	1.81	68
20-30	7.4	0.13	0.010	5	12	13	69	47.0	28.0	16.0	2.4	0.39	29	0.63	0.062	1.030	0.019	5	1.75	68
50-60	6.7	0.56	0.058	3	9	17	70	48.0	25.0	18.0	4.8	0.19	31	0.64	0.053	0.990	0.024	10	1.38	69
80-90	7.3	0.53	0.060	3	10	18	69	42.0	20.0	17.0	5.0	0.23	29	0.76	0.062	1.130	0.025	12	1.17	61
110-120	7.9	0.56	0.066	4	10	11	73	46.0	22.0	18.0	5.4	0.18	N/A	N/A	0.086	1.250	0.016	12	1.22	62
150-160	8.3	0.76	0.074	5	10	10	72	45.0	22.0	17.0	5.7	0.29	N/A	N/A	N/A	N/A	N/A	13	1.29	62

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
(cm)	pH	dS/m EC	% Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10 (Cult.)	7.5	N/A	N/A	1.4	0.08	N/A	74	1.70	30	17	1.4	0.8	4
B0-10 (Virgin)	7.1	N/A	N/A	1.4	0.07	N/A	64	1.10	59	42	2.0	0.6	8

Note: Total elements at 65 degrees Celsius; all other data reported at 105^{o}C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

CONDAMINE

REPRESENTATIVE SOIL PROFILE

Location:	209000 mE 7009500 mN Zone 56	**Site No:**	MWD 14
Landform element:	Plain	**Microrelief description:**	Absent
Landform pattern:	Flood plain	**Permeability:**	Slowly permeable
Slope:	5%	**Drainage:**	Imperfectly drained
Great Soil Group:	Black Earth	**Substrate lithology:**	Alluvium
Principal Profile Form:	Ug5.16	**Surface coarse fragments:**	Absent
Australian Soil Classification:	Epihypersodic, Self-mulching, Black Vertosol	**Surface condition:**	Self-mulching, cracking
Disturbance:	Grazing		
Vegetation:	Woodland. *Eucalyptus coolabah*, *Acacia salicina*, *A. pendula*, *Geijera parviflora*, *Santalum lanceolatum*		

Profile Morphology:

Horizon	Depth	Description
A1	0 to 0.05 m	Very dark greyish brown (10YR3/2) moist; medium heavy clay; weak 10-20mm sub-angular blocky, parting to granular 2-5mm; dry, weak; clear to-
B21	0.05 to 0.15 m	Very dark grey (10YR3/1) moist; medium heavy clay; strong 20-50mm sub-angular blocky; moist firm; dry, strong; clear to-
B22	0.15 to 0.60 m	Very dark greyish brown (10YR3/2) moist; heavy clay; strong 50-100mm angular blocky, parting to moderate 20-50mm angular blocky; dry, very strong; few, soft calcareous segregations; clear to-
B23	0.60 to 1.40 m	Dark greyish brown (10YR4/2) moist; heavy clay; strong 50-100mm lenticular, parting to 20-50mm angular blocky; slickensides; dry, very strong, very few, soft calcareous segregations; few gypseous crystals; gradual to-
B24	1.40 m +	Greyish brown (10YR5/2) moist; heavy clay; moderate 20-50mm lenticular; dry, very firm.

Analytical Data:

Depth	1:5 soil/water			Particle size %				pH 8.5 Alcoholic Cations meq%					BAR %	D.R	Total Element (%)			%		
(cm)	pH	dS/m EC	% Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	8.8	0.11	0.002	6	21	18	58	43.0	33.0	10.0	0.5	1.20	22	0.34	0.074	0.785	0.042	1	3.30	77
20-30	9.1	0.45	0.034	5	18	19	64	44.0	25.0	14.0	5.7	0.61	26	0.61	0.065	0.754	0.047	13	1.78	71
50-60	8.6	1.60	0.135	4	16	17	67	44.0	23.0	16.0	9.3	0.56	26	0.66	0.072	0.765	0.107	21	1.43	73
80-90	8.1	2.40	0.118	4	17	17	65	41.0	19.0	16.0	8.7	0.45	25	0.69	0.068	0.777	0.190	21	1.18	68
110-120	8.6	1.40	0.130	6	18	19	60	40.0	17.0	15.0	8.7	0.39	N/A	N/A	0.062	0.759	0.065	22	1.13	68
140-150	8.1	1.10	0.108	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
(cm)	pH	dS/m EC	% Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	8.7	0.13	0.001	1.6	0.08	15	44	1.10	7	3	0.9	0.3	N/A

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

COTTONVALE

REPRESENTATIVE SOIL PROFILE

Location: 396800 mE 6838100 mN Zone 56
Site No: SRM 17
Landform element: Upper slope
Microrelief description: Absent
Landform pattern: Undulating low hills
Permeability: Slowly permeable
Slope: 5%
Drainage: Poorly drained
Great Soil Group: Soloth
Substrate lithology: Granite
Principal Profile Form: Dy3.41
Surface coarse fragments: Common 2-6mm sub-rounded quartz
Australian Soil Classification: Bleached-Mottled, Magnesic-Natric, Grey Kurosol
Surface condition: Hardsetting
Disturbance: Grazing
Vegetation: Cleared

Profile Morphology:

Horizon	Depth	Description
A1	0.00 to 0.15 m	Dark brown (7.5YR 3/2) coarse sandy clay loam; moderate, granular; dry, firm; gradual to-
A2e	0.15 to 0.40 m	Light yellowish brown (2.5Y 6/3 moist, 2.5Y 7/4 dry) conspicuous bleach, coarse sandy loam; moderate 2-5mm granular structure; dry, weak; abrupt to-
B21t	0.40 to 0.65 m	Grey (7.5YR 6/1) coarse sandy light medium clay, many, very coarse prominent orange mottles; moderate 20-50mm angular blocky; gradual to-
B22t	0.65 to 1.00 m	Grey (7.5YR 6/1) coarse sandy light clay, many, very coarse prominent orange mottles; massive.

Analytical Data:

Depth	1:5 soil/water			Particle size				pH 7.0 Aqueous Cations					BAR	D.R	Total Element					
	dS/m		%	%				meq%					%		(%)			%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	5.8	0.03	0.003	50	23	6	19	4.0	1.7	1.8	0.1	0.32	7	0.59	0.019	3.420	0.024	2	0.94	21
20-30	6.0	0.03	0.003	75	19	4	6	1.0	0.3	0.7	0.2	0.05	3	0.10	0.007	3.670	0.009	18	0.38	20
50-60	4.3	0.52	0.076	36	12	6	47	7.0	0.2	4.3	2.2	0.22	15	0.10	0.010	2.160	0.015	31	0.04	15
80-90	4.5	0.18	0.025	43	19	6	30	4.0	0.1	2.6	0.9	0.11	10	0.10	0.007	2.910	0.008	22	0.03	12

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
	dS/m		%										
(cm)	pH	EC	Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	6.3	0.04	0.004	2.1	0.12	11	22	0.59	84	16	0.6	6.2	N/A

Note: Total elements at 65 degrees Celsius; all other data reported at 105^{o}C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

CRAIGMORE (Mound)

REPRESENTATIVE SOIL PROFILE

Location:	385109 mE 6955758 mN Zone 56	**Site No:**	EDS 558
Landform element:	Hillslope	**Microrelief description:**	Linear gilgai
Landform pattern:	Undulating rises	**Microrelief component:**	Mound
Slope:	8%	**Permeability:**	Slowly permeable
Great Soil Group:	Black Earth	**Drainage:**	Imperfectly drained
Principal Profile Form:	Ug5.15	**Substrate lithology:**	Basalt
Australian Soil Classification:	Haplic, Self-mulching, Black Vertosol	**Surface coarse fragments:**	Absent
Disturbance:	Grazing	**Surface condition:**	Self-mulching, cracking
Vegetation:	Grassland. *Dichanthium sericeum*, *Cynodon* spp.		

Profile Morphology:

Horizon	Depth	Description
A1	0 to 0.05 m	Dark (10YR 3/2) moist; medium clay; strong 2-5mm parting to <2mm granular; dry, very firm; very few 2-6mm calcareous concretions; field pH 8.5; abrupt to-
B1	0.05 to 0.15 m	Dark (7.5YR 3/2) moist; medium clay; strong 10-20mm sub-blocky parting to 2-5mm angular blocky; moderately moist, very firm; very few 2-6mm calcareous concretions and soft segregations; clear to-
B21	0.15 to 0.45 m	Dark (7.5YR 3/2) moist; medium heavy clay; strong 10-20mm sub-blocky parting to 5-10mm lenticular; very few 2-6mm calcareous concretions and soft segregations; field pH 8.8; clear to-
B22	0.45 to 0.70 m	Brown (7.5YR 3/3) moist; medium heavy clay; medium 10-20mm parting to 2-5mm lenticular; moist, firm; few 2-6mm calcareous concretions and soft segregations; field pH 9.0; clear to-
B23	0.70 to 1.40 m	Brown (7.5 YR 3/3) moist; medium heavy clay; strong 20-50mm parting to 5-10mm lenticular; moist, firm; few 2-6mm calcareous concretions and soft segregations; field pH 9.0.

Analytical data:

Depth	1:5 soil/water			Particle size				pH 8.5 Alcoholic Cations					BAR	D.R	Total Element					
		dS/m	%		%			meq%					%		%	%	%	%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	9.1	0.21	0.005	10	9	10	68	73.9	67.3	18.5	0.5	1.10	33	0.30	0.091	0.501	0.043	1	3.68	131
20-30	9.6	0.21	0.001	9	9	11	70	82.7	47.9	35.9	1.7	0.50	32	0.38	0.068	0.464	0.018	2	1.33	124
50-60	9.8	0.28	0.001	9	9	10	71	83.8	31.6	41.4	4.0	0.50	32	0.48	0.066	0.473	0.013	5	0.76	110
80-90	9.9	0.37	0.010	9	9	9	72	75.1	22.9	43.5	6.0	0.50	32	0.57	0.070	0.480	0.012	8	0.53	102
110-120	9.9	0.56	0.034	8	9	9	71	90.3	19.6	49.0	8.9	0.60	N/A	N/A	0.067	0.488	0.011	10	0.40	110

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
	dS/m		%										
(cm)	pH	EC	Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	8.9	0.20	0.003	2.5	0.20	118	22	1.10	15	14	2.0	1.0	4

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

CRAIGMORE (Depression)

REPRESENTATIVE SOIL PROFILE

Location:	385107 mE 6955757 mN Zone 56	**Site No:**	EDS 557
Landform element:	Hillslope	**Microrelief description:**	Linear gilgai
Landform pattern:	Undulating rise	**Microrelief component:**	Depression
Slope:	8%	**Permeability:**	Slowly permeable
Great Soil Group:	Black Earth	**Drainage:**	Imperfectly drained
Principal Profile Form:	Ug5.15	**Substrate lithology:**	Basalt
Australian Soil Classification:	Haplic, Self-mulching, Black Vertosol	**Surface coarse fragments:**	Absent
Disturbance:	Grazing	**Surface condition:**	Self-mulching, cracking
Vegetation:	Grassland. *Dichanthium sericeum*, *Urochloa* spp.		

Profile Morphology:

Horizon	Depth	Description
A1	0 to 0.04 m	Dark (10YR 2/1) moist; strong 2-5mm granular; dry, very firm; field pH 7.0; abrupt to-
B1	0.04 to 0.20 m	Dark (10YR 2/1) moist; strong 5-10mm sub-blocky parting to 2-5mm angular blocky; moderately moist, firm; field pH 8.0; clear to-
B21	0.20 to 0.40 m	Dark (10YR 2/1) moist; strong 10-20mm parting to 2-5mm angular blocky; moderately moist, firm; field pH 9.0; clear to-
B22	0.40 to 0.85 m	Dark (10YR 2/2) moist; strong 20-50mm parting to 2-5mm lenticular; moderately moist, firm; field pH 9.0; gradual to-
B23	0.85 to 1.05 m	Dark (7.5YR 3/2) moist; moderate 10-20mm parting to strong 2-5mm lenticular; moderately moist, firm; few 2-6mm soft calcareous segregations; field pH 9.0; gradual to-
B24	1.05 to 1.30 m	Red brown (5YR 3/3) moist; strong > 50mm parting to 5-10mm lenticular; moderately moist, very firm; few 2-6mm soft and concretionary calcareous segregations; field pH 9.0.

Analytical data:

Depth	1:5 soil/water			Particle size				pH 8.5 Alcoholic Cations					BAR	D.R	Total Element					
		dS/m	%	%				meq%					%		%	%	%	%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	8.1	0.14	0.002	3	9	10	76	85.9	55.1	22.0	0.6	1.50	38	0.39	0.108	0.635	0.054	1	2.36	101
20-30	9.6	0.21	0.001	1	7	10	79	90.9	55.5	32.2	3.5	0.70	40	0.46	0.084	0.552	0.026	4	1.63	109
50-60	9.9	0.30	0.007	3	7	10	79	88.6	48.7	36.5	6.6	0.70	41	0.47	0.076	0.556	0.018	8	1.28	112
80-90	9.7	0.72	0.066	7	8	11	72	76.0	34.8	42.4	9.6	0.60	37	0.62	0.070	0.481	0.015	13	0.81	121
110-120	9.8	0.79	0.070	5	7	11	76	80.7	20.7	41.4	10.6	0.40	N/A	N/A	0.069	0.500	0.011	13	0.49	95

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
		dS/m	%										
(cm)	pH	EC	Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	7.6	0.17	0.012	3.4	0.30	177	67	2.00	46	63	3.0	1.0	13

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

CUTTHROAT

REPRESENTATIVE SOIL PROFILE

Location: 241400 mE 7031450 mN Zone 56
Site No: MWD 9
Landform element: Footslope
Microrelief description: Absent
Landform pattern: Undulating rises
Permeability: Moderately permeable
Slope: 5%
Drainage: Poorly drained
Great Soil Group: Solodic
Substrate lithology: Sandstone
Principal Profile Form: Dy5.83
Surface coarse fragments: Absent
Australian Soil Classification: Eutrophic, Mottled-Mesonatric, Brown Sodosol
Surface condition: Loose
Disturbance:
Vegetation: Woodlands. *Eucalyptus populnea*, *Allocasuarina luehmannii*, *Geijera parviflora*, *Eucalyptus fibrosa* subsp. *fibrosa*, *Callitris glaucophylla*, *Grevillea striata*, *Petalostigma pubescens*, *Acacia* spp.

Profile Morphology:

Horizon	Depth	Description
A11	0 to 0.20 m	Dark brown (10YR 3/3)moist; loamy sand; dry, very weak; clear to-
A12	0.20 to 0.40 m	Brown (10YR 4/3) moist; loamy sand; dry very weak; clear to-
A21	0.40 to 0.58 m	Pale brown (10YR 6/3) moist, light grey (10YR 7/2) dry, loamy sand.
A22	0.58 to 0.60 m	Pale brown (10YR 6/3) moist, light grey (10YR 7/2) dry, loamy sand; common 6-20 mm gravel; dry, strong; abrupt to-
B21t	0.60 to 0.85 m	Brown (10YR 5/3) moist; 50% pale yellow mottle; 5% red mottle; sandy light clay; massive; common quartz coarse fragments; few 6-20 mm ironstone nodules; clear to-
B22t	0.85 to 1.20 m	Brown (10YR 5/3) moist; 50% pale yellow mottle; sandy light clay; massive; common quartz coarse fragments; few 6-20 mm ironstone nodules; clear to-
B3	1.20 to 1.40 m	Yellowish brown (10YR 5/4) moist; coarse sandy clay loam.

Analytical Data:

	1:5 soil/water			Particle size				pH 7.0 Aqueous Cations					BAR	D.R	Total Element					
Depth		dS/m	%	%				meq%					%		(%)			%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	5.5	0.02	0.001	53	34	5	10	3.0	1.9	0.5	0.1	0.22	4	0.82	0.022	0.171	0.027	2	3.51	27
20-30	6.6	0.04	0.002	56	34	5	6	3.0	1.9	0.5	0.2	0.13	2	0.77	0.017	0.123	0.024	4	3.58	46
50-60	6.7	0.02	0.002	49	42	7	3	1.0	0.5	0.4	0.1	0.08	1	0.99	0.015	0.117	0.022	8	1.54	36
80-90	7.8	0.10	0.006	40	30	6	24	10.0	1.6	6.1	1.7	0.16	9	0.96	0.016	0.188	0.023	17	0.26	40
110-120	8.6	0.14	0.012	42	38	1	16	8.0	0.6	4.9	2.6	0.15	N/A	N/A	0.018	0.153	0.023	33	0.11	51
140-150	8.8	0.28	0.029	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

	1:5 soil/water								DTPA extract.				
Depth		dS/m	%	%	%	P mg/kg		meq%	mg/kg				mg/kg
(cm)	pH	EC	Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	5.4	0.03	0.001	1.0	0.05	N/A	3.0	0.13	68	13	0.1	0.2	N/A

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

DALMENY

REPRESENTATIVE SOIL PROFILE

Location:	374211 mE 6966734 mN Zone 56	**Site No:**	EDS 842
Landform element:	Plains	**Microrelief description:**	Absent
Landform pattern:	Level alluvial plains	**Permeability:**	Slowly permeable
Slope:	<1%	**Drainage:**	Poorly drained
Great Soil Group:	Solodic	**Substrate lithology:**	Mixed sandstone and basaltic alluvium
Principal Profile Form:	Dd1.13	**Surface coarse fragments:**	Absent
Australian Soil Classification:	Eutrophic, Subnatric, Black Sodosol	**Surface condition:**	Hardsetting
Disturbance:	Grazing		
Vegetation:	Tall woodland. *Eucalyptus populnea*		

Profile Morphology:

Horizon	Depth	Description
A1	0 to 0.10 m	Brownish black (7.5YR3/1) moist, greyish yellow-brown (10YR4/2) dry; fine sandy clay loam; moderately moist, firm; field pH 6.5; abrupt to-
B21	0.10 to 0.25 m	Brownish black (10YR3/2) moist; medium heavy clay; strong 50-100mm columnar parting to strong 20-50mm angular blocky; dry, moderately strong; field pH 6.5; clear to-
B22	0.25 to 0.45 m	Brownish black (10YR3/2) moist; medium heavy clay; strong 5-10mm angular blocky; moist, moderately firm; field pH 8.0; gradual to-
B23	0.45 to 0.70 m	Brown (7.5YR4/3) moist; heavy clay; moderate 10-20mm angular blocky parting to moderate 5-10mm angular blocky; few medium calcareous concretions, few medium soft calcareous segregations; moderately moist, very firm; field pH 8.5; gradual to-
B24	0.70 to 1.50 m	Brown (7.5YR4/3) moist; medium clay; moderate 10-20mm prismatic, strong 5-10mm angular blocky; moderately moist, very firm; field pH 9.0.

Analytical data:

Depth	1:5 soil/water			Particle size				pH 8.5 Alcoholic Cations					BAR	D.R	Total Element					
		dS/m	%	%				meq%					%		%	%	%	%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	5.9	0.27	0.009	21	35	13	30	21.5	6.5	4.7	0.5	0.84	13	N/A	0.096	0.926	0.054	2	1.40	42
20-30	8.1	0.57	0.041	11	21	8	60	28.4	N/A	N/A	N/A	N/A	23	N/A	0.064	0.972	0.043	N/A	N/A	N/A
50-60	9.2	1.10	0.105	13	21	13	56	28.3	4.6	14.7	9.0	0.71	22	N/A	0.057	1.200	0.035	32	0.30	52
80-90	9.0	0.96	0.100	8	18	12	64	31.7	4.3	16.9	10.3	0.99	25	N/A	0.081	1.360	0.020	33	0.30	51
110-120	8.9	0.80	0.080	7	16	15	64	34.8	4.9	16.8	11.6	1.05	N/A	N/A	0.089	1.420	0.015	33	0.30	54
150-160	9.2	0.90	0.068	9	18	13	61	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.103	1.340	0.017	N/A	N/A	N/A

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
		dS/m	%										
(cm)	pH	EC	Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	6.7	0.24	0.003	3.1	0.26	83	55	1.33	85	111	2.6	1.7	34

Note: Total elements at 65 degrees Celsius; all other data reported at 105^{o}C
Note: 20-30A is in bleached part of A2j
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

Note: This soil may also be Hypernatric.
This soil has been included with *Haslemere* for the purpose of the manual.

DAVY

REPRESENTATIVE SOIL PROFILE

Location: 239500 mE 7022600 mN Zone 56
Site No: MWD 124
Landform element: Valley floor
Microrelief description: Absent
Landform pattern: Plain
Permeability: Highly permeable
Slope: 0%
Drainage: Well drained
Great Soil Group: Siliceous sand
Substrate lithology: Alluvium
Principal Profile Form: Uc1.21
Surface coarse fragments: Absent
Australian Soil Classification: Basic, Arenic, Orthic Tenosol
Surface condition: Loose
Disturbance:
Vegetation: Woodland. *Eucalyptus tereticornis*, *E. populnea*, *E. coolabah*, *Callitris glaucophylla*

Profile Morphology:

Horizon	Depth	Description
A11	0 to 0.08 m	Brown (10YR 5/3) moist; loamy sand; loose, single-grained; clear to-
A12	0.08 to 0.60 m	Brown (10YR 5/3) moist; loamy sand to sandy loam; loose; gradual to-
B2	0.60 to 1.20 m	Light yellowish brown (10YR 6/4) moist; sandy loam; loose.

Analytical Data:

Depth	1:5 soil/water			Particle size %				pH 7.0 Aqueous Cations meq%					BAR %	D.R	Total Element (%)			%		
(cm)	pH	dS/m EC	% Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-8	6.4	0.11	0.004	19	60	10	11	7.0	N/A	N/A	0.1	0.30	N/A	N/A	N/A	N/A	N/A	1	N/A	N/A
8-60	6.8	0.08	0.003	21	58	10	11	4.0	N/A	N/A	0.1	0.30	N/A	N/A	N/A	N/A	N/A	3	N/A	N/A
60-120	6.5	0.08	0.005	23	54	10	13	5.0	N/A	N/A	0.1	0.40	N/A	N/A	N/A	N/A	N/A	2	N/A	N/A

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
(cm)	pH	dS/m EC	% Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	N/A	N/A	N/A	1.1	0.11	N/A	13	NA	NA	NA	NA	NA	N/A

Note: Total elements at 65 degrees Celsius; all other data reported at 105^{o}C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

DIAMONDY

REPRESENTATIVE SOIL PROFILE

Location:	344400 mE 7031800 mN Zone 56	**Site No:**	MCD 2
Landform element:	Hillcrest	**Microrelief description:**	Absent
Landform pattern:	Undulating low hills	**Permeability:**	Moderately permeable
Slope:	2-4%	**Drainage:**	Imperfectly drained
Great Soil Group:	Solodic	**Substrate lithology**:	Sandstone
Principal Profile Form:	Db2.43	**Surface coarse fragments:**	Absent
Australian Soil Classification:	Eutrophic, Mesonatric, Brown Sodosol	**Surface condition:**	Hardsetting
Disturbance:	No effective disturbance		
Vegetation:	Closed Forest. *Brachychiton rupestris, Casuarina cristata, Eucalyptus crebra, Eucalyptus moluccana, softwood scrub Shrubs*		

Profile Morphology:

Horizon	Depth	Description
A1	0 to 0.25 m	Yellowish brown (10YR5/4) dry; dark brown (7.5YR3/3) moist; sandy loam; weak 2-5mm polyhedral; dry, very weak; field pH 6; clear to-
A2e	0.25 to 0.30 m	Very pale brown (10YR7/3) dry; dark yellowish brown (10YR4/4) moist; sandy loam; weak 2-5mm polyhedral; dry, moderately weak; field pH 6; clear to-
B21t	0.30 to 0.40 m	Brown (10YR5/3) dry; brown (10YR4/3) moist; few fine faint orange mottles; medium clay; strong 10-20mm sub-angular blocky; dry, moderately firm; field pH 6 to 8; diffuse to-
B22t	0.40 to 0.90 m	Yellowish brown (10YR5/8) moist; medium clay; moderate 10-20mm angular blocky, weak 20-50mm lenticular; dry, moderately firm; field pH 8 to 9; gradual to-
B23t	0.90 to 1.00 m	Brownish yellow (10YR6/8) moist; medium clay; weak 5-10mm sub-angular blocky; very few, medium 2-6mm calcareous nodules; dry, moderately firm; field pH 9.

Analytical data:

	1:5 soil/water			Particle size				pH 8.5 Alcoholic Cations					BAR	D.R	Total Element					
Depth		dS/m	%	%				meq%					%		%	%	%	%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	ECEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	6.7	0.04	0.001	9	75	8	11	7.0	3.7	1.3	0.6	0.72	6	0.39	0.111	0.305	0.031	9	2.80	58
20-30	7.0	0.02	0.001	3	29	8	62	3.0	2.5	0.6	0.1	0.22	3	0.10	0.040	0.205	0.038	3	3.90	6
30-40	8.1	0.16	0.006	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
50-60	8.7	0.77	0.129	4	26	15	52	17.3	5.8	6.6	5.2	0.39	17	0.88	0.036	0.513	0.033	30	0.88	35
70-80	8.6	1.60	0.285	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
90-100	8.9	1.40	0.240	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

	1:5 soil/water								DTPA extract.				
Depth		dS/m	%	%	%	P mg/kg		meq%	mg/kg				mg/kg
(cm)	pH	EC	Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	6.4	0.05	0.003	1.5	0.12	54	34	0.81	49	11	0.7	1.7	7

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

DOWNFALL

REPRESENTATIVE SOIL PROFILE

Location:	334900 mE 6911800 mN Zone 56	**Site No:**	MCD 23
Landform element:	Plain	**Microrelief description:**	Absent
Landform pattern:	Alluvial plain	**Permeability:**	Slowly permeable
Slope:	1-3%	**Drainage**:	Poorly drained
Great Soil Group:	Solodized solonetz	**Substrate lithology:**	Alluvium
Principal Profile Form:	Db1.13	**Surface coarse fragments:**	Absent
Australian Soil Classification:	Eutrophic, Mottled-Subnatric, Brown Sodosol	**Surface condition:**	Hardsetting
Disturbance:	Cleared. Pasture. Previous cultivation		
Vegetation:	*Eucalyptus populnea, Eucalyptus tesselaris*		

Profile Morphology:

Horizon	Depth	Description
A1c	0 to 0.15 m	Very dark greyish brown (10YR3/2) moist; fine sandy clay loam; very few, <5mm ferro-manganiferous concretions; moist, very weak; field pH 6.5; abrupt to-
B21t	0.15 to 0.30 m	Brown (10YR4/3) moist, dark yellowish brown (10YR4/6) moist; common coarse 15-30mm distinct orange mottles; medium clay; strong 10-20mm columnar; moderately moist, firm; field pH 6.5;gradual to-
B22t	0.30 to 0.50 m	Olive brown (2.5Y4/4) moist; medium heavy clay; moderate 5-10mm angular blocky; few coarse 6-20mm soft calcareous segregations; dry, strong; field pH 6.5; gradual to-
B23tc	0.5 to 1.10 m	Yellowish red (5YR5/6) moist; dark yellowish brown (10YR4/4) moist mottles; medium clay; few medium 6-20mm sub-rounded ironstone pebbles; dry, moderately strong; field pH 6.5 to 8; gradual to-
B24t	1.10 to 1.40 m	Greyish brown (2.5Y5/2) moist, yellowish red (5YR5/6) moist; field pH 8 to 7.5.

Analytical data:

Depth	1:5 soil/water			Particle size %				pH 8.5 Alcoholic Cations meq%					BAR %	D.R	Total Element %	%	%	%		
(cm)	pH	dS/m EC	% Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
B0-10	6.8	0.05	0.002	N/A	N/A	N/A	N/A	10.0	4.9	2.2	0.2	0.31	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0-10	6.5	0.03	0.002	29	43	11	17	8.1	4.9	2.1	0.2	0.25	6	0.66	0.037	0.182	0.045	2	2.30	44
20-30	7.4	0.08	0.002	22	31	8	41	20.3	8.0	9.2	2.6	0.13	15	0.76	0.022	0.158	0.022	13	0.90	49
50-60	8.8	0.61	0.083	20	32	11	40	20.3	5.5	9.9	5.0	0.20	15	0.94	0.017	0.16	0.021	25	0.60	51
80-90	9.2	0.80	0.083	19	30	10	42	21.4	6.1	11.2	6.0	0.15	17	0.97	0.015	0.187	0.023	28	0.55	56
110-120	9.0	0.88	0.096	15	29	11	48	27.7	6.0	13.3	7.4	0.16	N/A	N/A	0.015	0.203	0.018	27	0.45	56

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
(cm)	pH	dS/m EC	% Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	6.8	0.05	0.002	1.4	0.12	8	5	1	42	73	0.59	0.73	4

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

DRAYTON

REPRESENTATIVE SOIL PROFILE

Location: 393271 mE 6954418 mN Zone 56
Site No: EDS 849
Landform element: Plain
Microrelief description: Absent
Landform pattern: Gently undulating plains
Permeability: Moderately permeable
Slope: 2%
Drainage: Moderately well drained
Great Soil Group: Euchrozem
Substrate lithology: Basalt
Principal Profile Form: Gn3.13
Surface coarse fragments: Absent
Australian Soil Classification: Haplic, Eutrophic, Red Ferrosol
Surface condition: Firm
Disturbance: Grazing
Vegetation: Very tall woodland. *Eucalyptus grandis*

Profile Morphology:

Horizon	Depth	Description
A1	0 to 0.05 m	Dark reddish brown (5YR3/2) moist, dark reddish brown (5YR3/2) dry; clay loam; strong 2-5mm granular; dry, moderately weak; field pH 6; gradual to-
A3	0.05 to 0.20 m	Brownish black (5YR2/2) moist; light clay; strong 5-10mm sub-angular blocky, strong 2-5mm angular blocky; dry, moderately firm; clear to-
B2	0.20 to 0.50 m	Dark reddish brown (5YR3/4) moist; light medium clay; strong 5-10mm angular blocky, strong 2-5mm angular blocky; dry, moderately firm; field pH 7; clear to-
B31	0.50 to 0.90 m	Reddish brown (5YR4/5) moist; light clay; few large angular basalt pebbles, few medium angular basalt pebbles; moderate 5-10mm angular blocky parting to moderate 2-5mm angular blocky; dry, moderately firm; field pH 8.5; gradual to-
B32	0.90 to 1.50 m	Brown (7.5YR4/3) moist; light medium clay; common large angular basalt pebbles, few medium angular basalt pebbles; moderate 5-10mm angular blocky parting to moderate 2-5mm angular blocky; few, medium manganiferous laminae; dry, moderately firm; field pH 8.5-7.5.

Analytical Data:

Depth	1:5 soil/water			Particle size				pH 7.0 Aqueous Cations					BAR	D.R	Total Element					
		dS/m	%	%				meq%					%		%	%	%	%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
B0-10	5.9	0.12	0.003	N/A	N/A	N/A	45	28.1	15.6	8.4	0.1	3.84	N/A	N/A	N/A	N/A	N/A	<1	1.90	62
0-10	6.0	0.16	0.005	19	12	20	45	31.2	17.7	9.5	0.1	4.47	31	0.22	0.255	0.410	0.122	<1	1.90	70
20-30	6.8	0.06	0.000	6	12	20	62	20.6	11.4	6.1	0.1	3.51	25	0.25	0.118	0.270	0.036	1	1.90	34
50-60	7.2	0.07	0.001	11	9	13	63	13.5	7.2	4.6	0.1	1.76	26	0.32	0.101	0.160	0.029	1	1.60	22
80-90	7.3	0.09	0.002	14	12	17	61	13.2	6.9	5.4	0.2	0.93	27	0.32	0.105	0.094	0.025	2	1.30	22
110-120	7.2	0.11	0.005	14	13	22	50	13.5	6.2	6.5	0.7	0.16	N/A	N/A	0.104	0.042	0.022	5	1.00	27
140-150	7.1	0.11	0.005	N/A	N/A	N/A	50	13.5	4.6	7.6	1.0	0.09	N/A	N/A	N/A	N/A	N/A	8	0.60	26

Depth	1:5 soil/water					P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
	mS/cm	mS/cm	%	%	%								
(cm)	pH	EC	Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	5.9	0.12	0.003	9.1	0.90	114	286	2.70	283	97	6.4	31.2	25

Note: Total elements at 65 degrees Celsius; all other data reported at 105^{o}C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

DROME

REPRESENTATIVE SOIL PROFILE

Location:	355600 mE 6898400 mN Zone 56	**Site No:**	SRM 11
Landform element:	Mid to upper slope	**Microrelief Permeability:**	Absent
Landform pattern:	Undulating rises	**Permeability:**	Highly permeable
Slope:	<1%	**Drainage:**	Imperfectly drained
Great Soil Group:	Siliceous sand	**Substrate lithology:**	Sandstone (arenaceous)
Principal Profile Form:	Uc1.22	**Surface coarse fragments:**	Absent
Australian Soil Classification:	Basic, Arenic, Orthic Tenosol	**Surface condition:**	Loose
Disturbance:	Grazing		
Vegetation:	Open forest. *Callitris glaucophylla*, *Angophora leiocarpa*, *Eucalyptus tereticornis*, *Banksia integrifolia*		

Profile Morphology:

Horizon	Depth	Description
A0	0 to 0.02 m	Organic debris; abrupt to -
A11	0.02 to 0.15 m	Brown (10YR 5/3) moist; sandy loam; weak, 2-5mm, granular structure; dry, very weak; clear to-
A12	0.15 to 0.60 m	Brownish yellow (10YR 6/6) moist; loamy sand; single grain; gradual to-
B21	0.60 to 1.00 m	Brownish yellow (10YR 6/6) moist; very few medium red mottles; loamy sand, single grain; gradual to-
B22	1.00 to 1.20 m	Brownish yellow (10YR 6/6) moist; common red mottles; sandy loam, single grain.

Analytical Data:

Depth	1:5 soil/water			Particle size %				pH 7.0 Aqueous Cations meq%					BAR %	D.R	Total Element (%)			%		
(cm)	pH	dS/m EC	% Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	5.8	0.01	0.001	60	34	BQ	5	1.0	0.6	0.4	0.1	0.12	1	0.10	0.020	0.118	0.011	5	1.48	23
20-30	6.3	0.01	0.001	60	36	2	3	BQ	0.1	0.3	<0.1	0.07	1	0.10	0.010	0.118	0.008	N/A	0.25	14
50-60	6.6	0.01	0.002	54	41	4	1	BQ	0.1	0.2	<0.1	0.05	1	0.10	0.006	0.114	0.005	3	0.65	41
80-90	6.5	0.01	0.001	48	45	5	1	1.0	0.1	0.4	<0.1	0.04	N/A	0.10	0.010	0.155	0.007	4	0.31	57
100-110	9.2	0.29	0.031	N/A	N/A	N/A	N/A	1.0	0.1	1.0	<0.1	0.12	N/A	N/A	N/A	N/A	N/A	N/A	0.07	N/A

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
(cm)	pH	dS/m EC	% Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	5.6	0.04	0.003	0.8	0.02	10	15	0.12	47	15	0.1	0.7	N/A

Note: Total elements at 65 degrees Celsius; all other data reported at 105^{o}C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available
BQ – Below Quantifiable Level

EAST

REPRESENTATIVE SOIL PROFILE

Location:	318800 mE 7035500 mN Zone 56	**Site No:**	MCD 6
Landform element:	Hillslope	**Microrelief description:**	Absent
Landform pattern:	Undulating rises	**Permeability:**	Slowly permeable
Slope:	1-5%	**Drainage:**	Imperfectly drained
Great Soil Group:	Brown podzolic soil	**Substrate lithology:**	Sandstone
Principal Profile Form:	Dy4.23	**Surface coarse fragments:**	Few small sub-rounded quartz pebbles
Australian Soil Classification:	Haplic, Eutrophic, Brown Chromosol	**Surface condition:**	Soft
Disturbance:	Cultivation		
Vegetation:	Closed forest. *Geijera parviflora, Brachychiton rupestris, Flindersia collina*, *Acacia excelsa*		

Profile Morphology:

Horizon	Depth	Description
A11	0.00 to 0.15 m	Dark brown (7.5YR3/2) moist; brown (7.5YR4/3) dry; sandy loam; few small 2-6mm pebbles, sub-rounded quartz; weak 2-5mm prismatic; dry, very weak; field pH 5; clear to-
A1pc	0.15 to 0.2 m	Brown (7.5YR5/2) moist; brown (7.5YR4/4) dry; coarse sandy loam; many, small 2-6mm rounded ironstone pebbles; dry, moderately firm; field pH 5 to 5.5; abrupt to-
A2p	0.2 to 0.3 m	Dark brown (7.5YR3/4) dry; dark brown (7.5YR3/3) moist; clay loam; few, small 2-6mm sub-rounded ironstone pebbles; dry, moderately firm; field pH 5.5; abrupt to-
A22	0.3 to 0.4 m	Brown (7.5YR5/2) moist; dark brown (7.5YR3/3) dry; clay loam; very few <5mm manganiferous nodules; dry, moderately weak; field pH 5.5;clear to-
B21t	0.4 to 0.65 m	Yellowish brown (10YR5/8) dry; dark yellowish brown (10YR4/4) moist; medium clay; few, small 2-6mm sub-rounded ironstone pebbles; very few, <5mm manganiferous nodules; dry, very firm; field pH 5.5; clear to-
B22t	0.65 to 1.7 m	Dark yellowish brown (10YR4/4) moist; dark yellowish brown (10YR4/4) dry; medium heavy clay; strong 20-50mm angular blocky; dry, very strong; field pH 5.5 to 7.

Analytical data:

Depth	1:5 soil/water			Particle size				pH 7.0 Aqueous Cations					BAR	D.R	Total Element					
		dS/m	%	%				meq%					%		%	%	%	%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	ECEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	5.7	0.04	0.001	22	58	3	17	7.1	4.3	1.7	<0.1	1.12	5	0.42	0.085	0.311	0.019	<1	2.50	42
15-20	5.7	0.02	0.001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
20-30	5.5	0.03	0.001	23	46	5	24	7.1	4.9	1.5	<0.1	0.68	8	0.36	0.101	0.323	0.023	<1	3.28	30
30-40	6.2	0.04	0.001	N/A	N/A	N/A	N/A	7.0	5.0	1.6	0.1	0.29	N/A	N/A	N/A	N/A	N/A	1	3.13	N/A
50-60	6.4	0.03	0.001	21	45	5	30	8.1	6.3	2.0	0.1	0.13	9	0.29	0.057	0.236	0.016	1	3.10	29
80-90	7.2	0.13	0.002	15	28	5	54	18.4	11.3	5.8	0.7	0.16	17	0.34	0.024	0.260	0.011	4	1.97	33
100-110	7.8	0.11	0.002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
		dS/m	%										
(cm)	pH	EC	Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	6.1	0.04	0.001	0.8	0.07	88	75	1.00	62	52	1.4	1.4	4

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

EDGEFIELD

REPRESENTATIVE SOIL PROFILE

Location:	343100 mE 6995100 mN Zone 56	**Site No:**	MCD 1
Landform element:	Footslope	**Microrelief description:**	Absent
Landform pattern:	Gently undulating plains	**Permeability:**	Slowly permeable
Slope:	1-3%	**Drainage:**	Imperfectly drained
Great Soil Group:	Grey clay	**Substrate lithology:**	Alluvium
Principal Profile Form:	Ug5.16	**Surface coarse fragments:**	Very few, rounded ironstone pebbles
Australian Soil Classification:	Epicalcareous-Endohypersodic, Self-mulching, Grey Vertosol	**Surface condition:**	Self-mulching, cracking
Disturbance:	Cultivation		
Vegetation:	Forest. *Acacia harpophylla*		

Profile Morphology:

Horizon	Depth	Description
A1	0 to 0.05 m	Very dark grey (10YR3/1) moist; medium clay; moderate 2-5mm granular; dry, moderately weak; field pH 8.5; abrupt to-
Ap	0.05 to 0.30 m	Very dark grey (10YR3/1) moist; medium heavy clay; moderate 20-50mm platy; very few, medium 2-6mm calcareous concretions; dry, moderately firm; field pH 8.5; abrupt to-
B21k	0.30 to 0.60 m	Dark grey (10YR4/1) moist; medium heavy clay; moderate 20-50mm sub-angular blocky; common medium 2-6mm calcareous concretions; moist, moderately weak; field pH 8.5 to 9.5: gradual to-
B22	0.60 to 1.20 m	Greyish brown (10YR5/2) moist; heavy clay; moderate 10-20mm sub-angular blocky, weak 20-50mm lenticular; few medium 2-6mm calcareous concretions; moderately moist, moderately firm; field pH 9.5 to 8.5; gradual to-
B23c	1.20 to 1.60 m	Brown (10YR5/3) moist; heavy clay; weak 20-50mm sub-angular blocky; many <5mm manganiferous veins; moist, moderately weak; field pH 8.5 to 7; gradual to-
B24	1.60 to 1.70 m	Light brownish grey (2.5Y6/2) moist; few fine distinct orange mottles; heavy clay; weak 20-50mm sub-angular blocky; moist, moderately weak; field pH 7 to 5.5.

Analytical data:

	1:5 soil/water			Particle size				pH 8.5 Alcoholic Cations					BAR	D.R	Total Element					
Depth		dS/m	%	%				meq%					%		%	%	%	%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	ECEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	8.2	0.35	0.019	10	69	BQ	21	37.0	27.8	6.6	1.2	4.01	23	0.10	0.120	0.881	0.066	3	4.20	188
20-30	8.4	0.29	0.018	4	31	16	52	31.8	28.7	5.0	1.4	1.64	21	0.51	0.061	0.688	0.041	5	5.70	71
30-40	8.6	0.34	0.025	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
60-70	8.7	0.65	0.052	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
90-100	8.5	1.10	0.121	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
130-140	6.9	1.40	0.161	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
160-170	5.4	1.1	0.146	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

	1:5 soil/water								DTPA extract.				
Depth		dS/m	%	%	%	P mg/kg		meq%	mg/kg				mg/kg
(cm)	pH	EC	Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	8.2	0.14	0.033	2.7	0.23	512	314	0.32	25	25	2.8	4.4	32

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available
BQ – Below Quantifiable Levels

ELPHINSTONE

REPRESENTATIVE SOIL PROFILE

Location: 359700 mE 6970100 mN Zone 56
Site No: MCD 13
Landform element: Hillslope
Microrelief description: Absent (originally linear gilgai)
Landform pattern: Undulating rises
Permeability: Slowly permeable
Slope: 3-6%
Drainage: Imperfectly drained
Great Soil Group: Black earth
Substrate lithology: Sandstone (argillaceous)
Principal Profile Form: Ug5.1
Surface coarse fragments: Few, rounded quartz pebbles
Australian Soil Classification: Epihypersodic, Self-mulching, Black Vertosol
Surface condition: Self-mulching, cracking
Disturbance: Cultivation
Vegetation: Open woodland. *Eucalyptus populnea, Acacia omalophylla, Geijera parviflora*

Profile Morphology:

Horizon	Depth	Description
A1	0 to 0.05 m	Very dark grey (10YR3/1) moist; fine sandy medium clay; very few medium 6-20mm rounded quartz pebbles; moderate 2-5mm granular; dry, moderately weak; field pH 6; gradual to-
B21	0.05 to 0.80 m	Very dark grey (10YR3/1) moist; fine sandy heavy clay; very few medium 6-20mm rounded quartz pebbles; strong 50-100mm lenticular parting to moderate 10-20mm angular blocky; dry, very firm; field pH 6 to 7.5; gradual to-
B22	0.80 to 1.00 m	Greyish brown (10YR5/2) moist; fine sandy heavy clay; very few medium 6-20mm rounded quartz pebbles; strong 50-100mm lenticular parting to moderate 10-20mm angular blocky; dry, moderately firm; field pH 7.5;gradual to-
BC	1.00 to 1.20 m	Light yellowish brown (2.5Y6/4) moist; light medium clay; moderate 10-20mm sub-angular blocky parting to weak 10-20mm angular blocky; dry, moderately weak; field pH 7.5 to 6.5; gradual to-
C	1.20 to 1.60 m	Light yellowish brown (2.5Y6/4) moist; field pH 6.5.

Analytical data:

Depth	1:5 soil/water			Particle size %				pH 8.5 Alcoholic Cations meq%					BAR %	D.R	Total Element %			%		
(cm)	pH	dS/m EC	% Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	6.7	0.08	0.002	9	39	15	34	29.8	12.3	7.7	0.4	1.03	18	0.51	0.051	0.650	0.062	1	1.60	63
20-30	7.3	0.37	0.026	4	21	15	59	53.4	20.9	16.7	5.6	0.48	28	0.83	0.029	0.646	0.045	10	1.30	74
50-60	8.1	1.20	0.119	3	17	17	64	55.9	20.0	20.0	10.5	0.43	32	0.88	0.020	0.602	0.076	18	1.00	80
80-90	8.7	1.10	0.101	3	22	18	59	47.2	19.9	18.9	10.0	0.61	28	0.95	0.017	0.819	0.065	21	1.10	84
110-120	8.9	0.98	0.080	1	24	22	52	50.3	18.9	18.9	9.7	0.35	N/A	N/A	0.018	1.390	0.049	19	1.00	92

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
(cm)	pH	dS/m EC	% Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	7.2	0.07	0.002	1.8	0.04	19	8	2.00	36	34	1.3	0.5	6

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

FLINTON

REPRESENTATIVE SOIL PROFILE

Location:	245450 mE 7032250 mN Zone 56	**Site No:**	MWD 5
Landform element:	Hillslope (upper)	**Microrelief description:**	Absent
Landform pattern:	Undulating low hills	**Permeability:**	Moderately permeable
Slope:	4%	**Drainage:**	Well drained
Great Soil Group:	Red earth	**Substrate lithology:**	Sandstone
Principal Profile Form:	Gn2.11	**Surface coarse fragments:**	Absent
Australian Soil Classification:	Acidic, Mellic, Red Kandosol	**Surface condition:**	Hardsetting
Disturbance:	Grazing		
Vegetation:	Open forest. *Eucalyptus crebra*, *Acacia shirleyi*, *Petalostigma pubescens*		

Profile Morphology

Horizon	Depth	Description
A1	0 to 0.35 m	Dark reddish brown (5YR 3/3) moist; sandy loam; weak 2-5 mm granular; clear to-
B21	0.35 to 0.65 m	Dark reddish brown (2.5YR 3/4) moist; coarse sandy clay loam; massive; dry, weak; clear to-
B22t	0.65 to 0.85 m	Red (2.5YR 4/6) moist; light clay; abundant 10-40 mm gravel; dry, firm; clear to-
B23t	0.85 to 1.05 m	Yellowish red (5YR 4/6) moist; light clay; massive; dry, firm; clear to-
B3	1.05 to 1.30 m	Yellowish red (5YR 5/8) moist; 50% brown mottle; light clay; massive; dry, firm.

Analytical Data:

	1:5 soil/water			Particle size				pH 7.0 Aqueous Cations					BAR	D.R	Total Element					
Depth		dS/m	%		%			meq%					%		(%)			%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	4.7	0.17	0.010	59	24	3	14	3.0	0.9	0.7	0.1	0.64	5	0.70	0.031	0.470	0.040	4	1.27	17
20-30	4.5	0.05	0.002	52	24	3	20	3.0	0.2	0.4	0.1	0.34	6	0.51	0.026	0.525	0.031	3	0.55	5
50-60	4.4	0.04	0.001	45	26	3	26	3.0	0.2	0.4	0.1	0.33	8	0.19	0.026	0.507	0.039	2	0.61	4
80-90	4.6	0.04	0.003	45	14	4	37	5.0	0.2	2.5	0.3	0.44	11	0.34	0.022	0.457	0.028	6	0.10	9
110-120	4.8	0.07	0.006	55	10	3	30	9.0	0.1	7.3	0.9	0.47	N/A	N/A	0.014	0.537	0.026	10	0.01	29

	1:5 soil/water								DTPA extract.				
Depth		dS/m	%	%	%	P mg/kg		meq%		mg/kg			mg/kg
(cm)	pH	EC	Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	5.1	0.07	0.002	2.6	0.22	35	23	1.60	140	21	0.7	5.2	N/A

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

FORMARTIN

REPRESENTATIVE SOIL PROFILE

Location:	352300 mE 6968300 mN Zone 56	**Site No:**	MCD 14
Landform element:	Plain	**Microrelief description:**	Absent
Landform pattern:	Alluvial plain	**Permeability:**	Moderately permeable
Slope:	0-2%	**Drainage:**	Well drained
Great Soil Group:	Red Podzolic	**Substrate lithology:**	Alluvium
Principal Profile Form:	Dy4.62	**Surface coarse fragments:**	Absent
Australian Soil Classification:	Haplic, Eutrophic, Brown Chromosol	**Surface condition:**	Loose
Disturbance:	Cultivation		
Vegetation:	Open Woodland. *Eucalyptus populnea* (in undisturbed areas)		

Profile Morphology:

Horizon	Depth	Description
A1	0 to 0.15 m	Dark greyish brown (10YR4/2) moist; sand; moist, very weak; field pH 5.5; abrupt to-
A2	0.15 to 0.80 m	Pale brown (10YR6/3) moist; light grey (10YR7/2) dry; sand; field pH 5.5 to 7; abrupt to-
B21t	0.80 to 1.40 m	Yellowish brown (10YR5/8) moist; sandy clay loam; dry, very strong; field pH 7 to 6; abrupt to-
B22t	1.40 to 1.60 m	Light brownish grey (10YR6/2) moist; yellowish brown (10YR5/8) moist; moist moderately weak; field pH 7.5 to 6.5.

Analytical data:

Depth	1:5 soil/water			Particle size %				pH 8.5 Alcoholic Cations meq%					BAR %	D.R	Total Element %			%		
(cm)	pH	dS/m EC	% Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	6.5	0.05	BQ	37	47	3	13	6.0	3.1	2.5	0.1	1.21	5	0.50	0.072	0.848	0.025	2	1.20	54
20-30	6.8	0.02	BQ	40	41	6	13	5.0	4.4	2.5	0.1	0.33	5	0.64	0.060	0.790	0.016	3	1.80	57
50-60	7.4	0.03	BQ	24	26	3	48	25.6	12.3	7.5	0.4	0.59	17	0.35	0.148	0.827	0.021	2	1.64	43
80-90	7.6	0.04	BQ	23	29	4	45	19.5	13.3	9.4	0.5	0.60	19	0.40	0.087	0.807	0.017	2	1.41	53
110-120	8.0	0.03	BQ	26	38	8	31	0.0	10.2	7.5	0.4	0.38	N/A	N/A	0.068	0.836	0.013	N/A	1.37	60

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
(cm)	pH	dS/m EC	% Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	6.5	0.03	0.000	0.7	0.05	98	40	0.75	32	21	0.8	0.4	3

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available
BQ – Below Quantifiable Level

GAMMIE

REPRESENTATIVE SOIL PROFILE

Location:	367980 mE 6830900 mN Zone 56	**Site No:**	SRM 13
Landform element:	Hillslope	**Microrelief description:**	Absent
Landform pattern:	Rolling low hills	**Permeability:**	Slowly permeable
Slope:	5%	**Drainage:**	Imperfectly drained
Great Soil Group:	Lithosol	**Substrate lithology:**	Traprock (metamorphic rocks)
Principal Profile Form:	Um2.12	**Surface coarse fragments:**	Gravel
Australian Soil Classification:	Halpic, Eutrophic, Brown Kandosol	**Surface condition:**	Hardsetting
Disturbance:	Grazing		
Vegetation:	Woodland. *Eucalyptus* spp., *Acacia* spp.		

Profile Morphology:

Horizon	Depth	Description
A1	0 to 0.10 m	Dark brown (10YR 3/3) clay loam; massive; few angular gravel; dry, firm; gradual to-
A2e	0.10 to 0.20 m	Yellowish brown (10YR 5/6 moist, 10YR 8/3 dry) conspicuous bleach, clay loam; many angular gravels; massive; dry, firm; gradual to-
B3e	0.20 to 0.40 m	Yellowish brown (10YR 5/6 moist, 10YR 8/3 dry) conspicuous bleach, clay loam; many angular gravels; massive; dry, firm; interspersed with weathered rock; gradual to-
R	0.40 m +	Rock

Analytical Data:

Depth	1:5 soil/water			Particle size %				pH 7.0 Aqueous Cations meq%					BAR %	D.R	Total Element (%)			%		
(cm)	pH	dS/m EC	% Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	6.8	0.01	0.001	24	13	31	32	9.0	6.3	1.7	0.1	0.63	9	0.64	0.046	3.170	0.02	<1	3.70	27
20-30	7.7	0.02	0.001	19	12	36	33	7.0	4.6	1.8	0.1	0.12	7	0.66	0.025	3.190	0.006	1	2.55	20
50-60	5.6	0.04	0.005	21	10	35	35	4.0	0.5	2.9	0.3	0.11	8	0.74	0.019	3.350	0.006	8	0.17	11

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
(cm)	pH	dS/m EC	% Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	6.8	0.02	0.001	1.4	0.10	31	24	0.83	20	19	0.3	1.0	N/A

Note: Total elements at 65 degrees Celsius; all other data reported at 105^{o}C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

GATE

REPRESENTATIVE SOIL PROFILE

Location:	331700 mE 6905300 mN Zone 56	**Site No:**	MCD 16
Landform element:	Hillcrest	**Microrelief description:**	Absent
Landform pattern:	Rolling low hills	**Permeability:**	Slowly permeable
Slope:	2-5%	**Drainage:**	Imperfectly drained
Great Soil Group:	Grey clay	**Substrate lithology:**	Sandstone
Principal Profile Form:	Ug5.14	**Surface coarse fragments:**	Absent
Australian Soil Classification:	Endohypersodic, Crusty, Red Vertosol	**Surface condition:**	Crusting, cracking
Disturbance:	Cultivation		
Vegetation:	Forest. *Acacia harpophylla, Melaleuca bracteata* (in undisturbed areas)		

Profile Morphology:

Horizon	Depth	Description
A1p	0 to 0.10 m	Dark (10YR3/1) moist; medium clay; weak 5-10mm granular; moderately moist, very weak; field pH 6.5; clear to-
B21	0.10 to 0.35 m	Dark (10YR3/1) moist; medium clay; moderate 10-20mm sub-angular blocky; moderately moist, moderately firm; field pH 8.5; clear to-
B22	0.35 to 0.70 m	Yellow-grey (2.5Y5/3) moist; medium heavy clay; common medium yellow mottles; moderate 10-20mm sub-angular blocky; slickensides; moderately moist, moderately firm; few 2-6mm calcareous veins; field pH 7; gradual to-
BC	0.70 to 1.60 m	Pale (10YR7/2, 10YR6/8) moist; medium heavy clay; common large brown mottles; moderately moist; strong; field pH 5.

Analytical data:

Depth	1:5 soil/water			Particle size				pH 8.5 Alcoholic Cations					BAR	D.R	Total Element					
		dS/m	%	%				meq%					%		%	%	%	%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
B0-10	7.8	0.09	0.001	N/A	N/A	N/A	N/A	30.0	19.0	7.4	1.0	0.50	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0-10	7.4	0.05	0.001	2	46	9	43	28.7	18.4	7.5	0.5	0.60	15	0.49	0.037	0.855	0.032	2	2.50	63
20-30	8.9	0.28	0.011	1	35	13	52	32.8	18.5	10.3	2.9	0.30	20	0.53	0.021	0.782	0.046	9	1.80	61
50-60	8.8	0.54	0.060	BQ	36	17	47	29.6	13.3	11.2	4.4	0.20	19	0.87	0.011	1.140	0.034	15	1.20	62
80-90	6.1	0.47	0.060	BQ	49	16	34	26.6	10.1	10.2	5.3	0.20	17	0.79	0.010	1.270	0.015	20	0.99	76
110-120	5.3	0.54	0.081	BQ	47	15	37	28.7	8.5	10.2	5.4	0.30	N/A	N/A	0.009	1.200	0.013	19	0.83	66

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
(cm)	pH	dS/m EC	% Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	7.8	0.09	0.001	1.1	0.09	59	33	1.60	16	6	0.5	0.5	4

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available
BQ – Below Quantifiable Level

Note: Gate is more commonly a Grey Vertosol.

HANMER

REPRESENTATIVE SOIL PROFILE

Location:	353300 mE 6999200 mN Zone 56	**Site No:**	SRM 1
Landform element:	Hillcrest	**Microrelief description:**	Absent
Landform pattern:	Rolling low hills	**Permeability:**	Slowly permeable
Slope:	2%	**Drainage:**	Imperfectly drained
Great Soil Group:	Yellow podzolic	**Substrate lithology:**	Lateritised sandstone
Principal Profile Form:	Dy3.21	**Surface coarse fragments:**	Common 6-60 mm angular gravel
Australian Soil Classification:	Mottled, Magnesic, Brown Chromosol	**Surface condition:**	Hardsetting
Disturbance:	Grazing		
Vegetation:	Open forest. *Eucalyptus crebra*, *Acacia leiocalyx*, *Callitris glaucophylla*, *Angophora leiocarpa*		

Profile Morphology:

Horizon	Depth	Description
A1	0 to 0.10 m	Dark brown (7.5YR 4/2) moist; sandy loam; many coarse fragments; weak 5-10mm polyhedral; dry, very weak; clear to-
A2c	0.10 to 0.45 m	Brown (7.5YR 5/4) moist; sandy loam; abundant gravel; massive; few 2-6mm ferruginous nodules; clear to-
B21t	0.45 to 0.55 m	Yellowish red (5YR 5/6) moist; few, faint pale mottles; heavy clay, few coarse fragments (gravel/quartz/ironstone); weak 10-20mm, sub-angular blocky; dry, very firm; gradual to-
B22tc	0.55 to 0.90 m	Yellowish red (5YR 5/8)moist; many grey mottles; medium clay, common, coarse quartz and ironstone fragments; weak 10-20mm angular blocky; gradual to-
B3	0.90 m +	Pale red (2.5YR 7/1) moist; common, prominent red mottles; light clay, weak 10-20mm angular blocky; sandstone fragments.

Analytical Data:

Depth	1:5 soil/water			Particle size				pH 7.0 Aqueous Cations					BAR	D.R	Total Element					
	dS/m		%	%				meq%					%		(%)			%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	5.6	0.01	0.001	40	38	6	17	6.0	3.4	1.4	0.1	0.32	7	0.31	0.039	0.134	0.036	1	2.40	31
20-30	5.7	0.01	0.001	37	32	5	27	3.0	0.1	1.2	0.1	0.20	8	0.31	0.024	0.109	0.017	3	0.10	6
45-55	5.1	0.02	0.002	26	20	3	52	4.0	0.1	1.5	0.2	0.09	14	0.30	0.020	0.109	0.015	4	0.05	4
70-80	5.2	0.02	0.002	22	14	4	60	4.0	0.1	1.9	0.2	0.06	16	0.21	0.012	0.104	0.015	5	0.03	4
110-120	4.8	0.03	0.003	20	14	5	59	6.0	0.1	1.8	0.3	0.07	17	0.25	0.008	0.117	0.012	4	0.04	4

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. Mg/kg				mg/kg
	dS/m		%										
(cm)	pH	EC	Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	5.6	0.03	0.002	3.4	0.16	18	8	0.25	44	17	0.1	41.0	N/A

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

HASLEMERE

REPRESENTATIVE SOIL PROFILE

Location:	326700 mE 6943400 mN Zone 56	**Site No:**	MCD 18
Landform element:	Plain	**Microrelief description:**	Absent
Landform pattern:	Alluvial plain	**Permeability:**	Very slowly permeable
Slope:	2%	**Drainage:**	Poorly drained
Great Soil Group:	Solodized Solonetz	**Substrate lithology:**	Alluvium
Principal Profile Form:	Dd1.43	**Surface coarse fragments:**	Absent
Australian Soil Classification:	Eutrophic, Subnatric, Black Sodoosol	**Surface condition:**	Hardsetting
Disturbance:	Complete clearing. Pasture, native or improved, cultivated at some stage		
Vegetation:	Woodland. *Eucalyptus populnea*		

Profile Morphology:

Horizon	Depth	Description
A1	0 to 0.15 m	Very dark greyish brown (10YR3/2) moist; coarse sandy clay loam; moderately moist, very weak; field pH 6; clear to-
A2e	0.15 to 0.20 m	Grey (10YR6/1) dry, very dark grey (10YR3/1) moist; sandy loam; moderately moist, very weak; field pH 6; clear to-
B21t	0.20 to 0.50 m	Very dark greyish brown (10YR3/2) moist; medium heavy clay; moderate 100-200mm columnar, moderate 20-50mm angular blocky; moderately moist, very firm; field pH 6 to 8.5; gradual to-
B22t	0.50 to 0.80 m	Very dark greyish brown (10YR3/2) moist; medium clay; few coarse 6-20mm soft calcareous segregations; dry, moderately strong; field pH 8.5 to 9; clear to-
B23t	0.80 to 1.20 m	Brown (10YR5/3) moist, very dark greyish brown (10YR3/2) moist; few very coarse 15-30mm distinct orange mottles; medium clay; very few coarse 6-20mm soft calcareous segregations; dry, moderately strong; field pH 9.

Analytical data:

Depth	1:5 soil/water			Particle size %				pH 8.5 Alcoholic Cations meq%					BAR %	D.R	Total Element %			%		
(cm)	pH	dS/m EC	% Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
B0-10	7.0	0.08	0.002	N/A	N/A	N/A	N/A	16.0	6.2	4.9	0.4	0.80	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0-10	6.9	0.07	0.002	54	16	8	21	18.3	7.3	5.7	0.4	0.86	11	0.99	0.101	1.380	0.042	2	1.30	68
20-30	7.8	0.16	0.008	37	12	5	45	34.8	13.3	12.3	4.1	0.28	21	0.89	0.059	0.903	0.033	12	1.10	67
55-65	9.3	0.28	0.016	54	14	7	25	19.3	7.3	9.0	3.9	0.16	13	0.99	0.028	1.280	0.040	20	0.80	81
90-100	9.4	0.40	0.018	N/A	N/A	N/A	N/A	26.0	9.3	12.0	5.8	0.35	N/A	N/A	N/A	N/A	N/A	22	0.80	N/A

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
(cm)	pH	dS/m EC	% Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	7.0	0.08	0.002	1.8	0.17	191	118	2.90	104	19	1.2	1.5	7

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

Note: While this representative profile keys out as black (due to the colour of the upper part of the profile) the soil is more commonly brown in colour.

HASLEMERE

REPRESENTATIVE SOIL PROFILE

Location:	355600 mE 6986900 mN Zone 56	**Site No:**	MCD 22
Landform element:	Plain	**Microrelief description:**	Absent
Landform pattern:	Alluvial plain	**Permeability:**	Slowly permeable
Slope:	1-3%	**Drainage:**	Imperfectly drained
Great Soil Group:	No suitable group affinity to Solodic	**Substrate lithology:**	Alluvium
Principal Profile Form:	Db1.13	**Surface coarse fragments:**	Absent
Australian Soil Classification:	Sodic, Eutrophic, Brown Chromosol	**Surface condition:**	Hardsetting
Disturbance:	Cultivation		
Vegetation:	Woodland. *Eucalyptus populnea, Geijera parviflora*		

Profile Morphology:

Horizon	Depth	Description
A1	0 to 0.15 m	Dark brown (7.5YR3/2) moist; clay loam; weak 2-5mm polyhedral; dry, moderately weak; field pH 5.8; abrupt to-
B21t	0.15 to 0.50 m	Brown (7.5YR4/3) moist, brown (7.5YR4/2) dry; medium clay; strong 20-50mm angular blocky; dry, very firm; field pH 5.8 to 7.5; clear to-
B22tk	0.50 to 0.90 m	Brown (7.5YR4/4) moist, brown (7.5YR4/4) dry; medium clay; moderate 50-100mm lenticular, moderate 20-50mm sub-angular blocky; many coarse 6-20mm calcareous soft segregations; dry, very firm; field pH 7.5 to 9.5; gradual to-
B23t	0.90 to 1.80 m	Brown (7.5YR5/3) moist; medium clay; moderate 10-20mm lenticular, moderate 5-10mm sub-angular blocky; field pH 9.5.

Analytical data:

Depth	1:5 soil/water			Particle size				pH 8.5 Alcoholic Cations					BAR	D.R	Total Element					
		dS/m	%	%				meq%					%		%	%	%	%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
B0-10	6.4	0.06	0.004	N/A	N/A	N/A	N/A	8.0	3.4	1.9	0.1	0.95	N/A	N/A	N/A	N/A	N/A	1	1.79	N/A
0-10	6.4	0.04	0.001	24	52	4	17	8.1	3.6	1.9	<0.1	0.97	6	0.63	0.078	0.844	0.019	1	1.90	39
20-30	7.9	0.06	0.001	14	30	4	51	25.6	14.4	10.0	1.1	1.00	19	0.36	0.079	0.973	0.023	4	1.40	52
50-60	9.0	0.22	0.001	13	26	10	52	27.9	15.5	14.5	2.2	0.60	21	0.41	0.068	0.998	0.024	8	1.10	63
80-90	9.4	0.41	0.014	8	20	12	60	31.3	10.3	19.8	4.8	0.95	24	0.74	0.131	1.200	0.033	15	0.50	60
110-120	9.4	0.58	0.029	6	20	10	63	34.4	8.1	21.9	6.4	1.02	N/A	N/A	0.135	1.250	0.025	19	0.40	59

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
		dS/m	%										
(cm)	pH	EC	Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	6.4	0.06	0.004	1.0	0.08	97	31	6.90	61	23	1.0	0.7	10

Note: Total elements at 65 degrees Celsius; all other data reported at 105^{o}C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

Note: It is possible that the decreased EC, Cl, ESP in this profile, in comparison to the undisturbed profile (MCD18), is a function of cultivation history.

IRVING

REPRESENTATIVE SOIL PROFILE

Location:	391503 mE 6967470 mN Zone 56	**Site No.**	EDS 560
Landform element:	Hillslope	**Microrelief description:**	Absent
Landform pattern:	Undulating rises	**Permeability:**	Slowly permeable
Slope:	3%	**Drainage:**	Imperfectly drained
Great Soil Group:	Black Earth	**Substrate lithology:**	Basalt
Principal Profile Form:	Ug5.15	**Surface coarse fragments:**	Absent
Australian Soil Classification:	Haplic, Self-mulching, Black Vertosol	**Surface condition:**	Self-mulching, cracking
Disturbance:	Pasture (old cultivation)		
Vegetation:	Grassland. *Dichanthium sericeum*		

Profile Morphology:

Horizon	Depth	Description
A1	0 to 0.03 m	Dark (10YR 1/1) moist; medium clay; strong <2mm granular; moderately moist, firm; field pH 6.5; abrupt to-
B1	0.03 to 0.20 m	Dark (10YR 1/1) moist; medium heavy clay; strong 2-5mm sub-blocky parting to <2mm granular; moderately moist, firm; clear to-
B21	0.20 to 1.00 m	Dark (10YR 2/1) moist; medium heavy clay; strong 5-10mm parting to moderate <2mm lenticular; field pH 7.5 to 8.5; clear to-
B22	1.00 to 1.45 m	Dark (10YR 2/1) moist; medium heavy clay; strong 5-10mm parting to 2-5mm lenticular; moist, firm; field pH 8.5; abrupt to-
B23	1.45 to 1.75 m	Brown (7.5YR 3/4) moist; medium heavy clay; strong 10-20mm parting to 2-5mm lenticular; moist, firm; few 2-6mm soft calcareous segregations; field pH 9.0.

Analytical data:

Depth	1:5 soil/water			Particle size				pH 8.5 Alcoholic Cations					BAR	D.R	Total Element					
		dS/m	%	%				meq%					%		%	%	%	%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	7.8	0.09	0.005	1	8	19	70	90.8	41.6	32.8	0.8	0.60	32	0.39	0.098	0.598	0.029	1	1.18	104
20-30	8.4	0.09	0.002	1	7	20	72	83.3	35.1	35.1	1.9	0.40	33	0.29	0.102	0.702	0.025	2	0.94	96
50-60	8.9	0.15	0.011	1	7	19	71	91.1	43.9	40.6	3.0	0.50	36	0.50	0.106	0.737	0.022	4	1.02	118
80-90	9.2	0.48	0.042	1	9	20	70	91.0	30.7	43.8	4.2	0.50	36	N/A	0.107	0.794	0.018	5	0.65	110
110-120	9.0	0.48	0.058	1	11	21	67	80.6	26.1	45.7	4.7	0.60	N/A	N/A	0.134	0.968	0.010	7	0.52	115

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
		dS/m	%										
(cm)	pH	EC	Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	7.9	0.15	0.011	2.1	0.20	264	34	0.90	34	35	3.0	1.0	8

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

KARANGI

REPRESENTATIVE SOIL PROFILE

Location:	369400 mE 6891200 mN Zone 56	**Site No:**	SRM 14
Landform element:	Hillslope	**Microrelief description:**	Absent
Landform pattern:	Undulating low hills	**Permeability:**	Slowly permeable
Slope:	2%	**Drainage:**	Imperfectly drained
Great Soil Group:	Soloth	**Substrate lithology:**	Traprock (metamorphic rocks)
Principal Profile Form:	Dy3.42	**Surface coarse fragments:**	Common 6-20mm angular metamorphic
Australian Soil Classification:	Eutrophic, Subnatric, Brown Sodosol	**Surface condition:**	Hardsetting
Disturbance:	Grazing		
Vegetation:	Woodland. *Eucalyptus conica*, *E. microcarpa*, *E. dealbata*		

Profile Morphology:

Horizon	Depth	Description
A1	0 to 0.20 m	Brown (10YR 4/3) moist; clay loam; very abundant large 20-60mm pebbles; gradual to-
A2e	0.20 to 0.35 m	Yellowish brown (10YR 5/4 moist, 10YR 7/2 dry) conspicuous bleach; sandy clay loam; very abundant large 20-60mm pebbles; clear to-
B21t	0.35 to 0.55 m	Yellowish brown (10YR 5/8) moist; fine yellow mottles; medium heavy clay, faint, very few small 2-6mm pebbles; moderate angular blocky structure; gradual to-
B22t	0.55 to 0.70 m	Brownish yellow (10YR 6/6) moist; faint, fine red mottles; medium clay, common angular metamorphic fragments; massive; gradual to-
C	0.70 m +	Weathered rock.

Analytical Data:

Depth	1:5 soil/water	dS/m	%	Particle size	%			pH 7.0 Aqueous Cations	meq%				BAR %	D.R	Total Element (%)			%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	6.0	0.01	0.001	27	42	15	14	4.0	2.2	1.4	0.1	0.30	5	0.77	0.040	1.200	0.015	1	1.57	28
20-30	6.0	0.03	0.001	21	34	2	41	5.0	0.7	2.9	0.3	0.20	6	0.87	0.019	1.190	0.009	8	0.24	10
30-40	6.0	0.08	0.006	N/A	N/A	N/A	N/A	10.0	0.9	7.4	1.0	0.20	N/A	N/A	N/A	N/A	N/A	11	0.12	N/A
50-60	6.3	0.54	0.073	10	29	18	40	16.0	0.4	11.0	4.4	0.10	13	0.96	0.011	1.840	0.012	28	0.03	40
80-90	7.4	0.60	0.077	28	32	2	38	15.0	0.2	8.3	6.2	0.10	8	0.77	0.012	2.430	0.008	42	0.02	39

Depth	1:5 soil/water	dS/m	%	%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
(cm)	pH	EC	Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
0-10	N/A	N/A	N/A	2.1	0.11	<5	N/A	0.35	N/A	N/A	N/A	N/A	N/A

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

KENMUIR

REPRESENTATIVE SOIL PROFILE

Location:	394500 mE 6940500 mN Zone 56	**Site No:**	B 223
Landform element:	Hillslope	**Microrelief description:**	Absent
Landform pattern:	Undulating rises	**Permeability:**	Moderately permeable
Slope:	10-20%	**Drainage:**	Well drained
Great Soil Group:	Lithosol	**Substrate lithology:**	Basalt
Principal Profile Form:	NSG	**Surface coarse fragments:**	Common basalt cobbles
Australian Soil Classification:	Haplic, Eutrophic, Brown Dermosol	**Surface condition:**	Soft
Disturbance:	Grazing		
Vegetation:	Woodland. *Eucalyptus orgadophila E. crebra*		

Profile Morphology:

Horizon	Depth	Description
A1	0 to 0.20 m	Brown (7.5YR 4/2) moist; clay loam; strong granular; common basalt gravel and stone
B3	0.22 to 0.40 m	Dark red-brown and yellow-grey; light medium clay; strong <5mm blocky structure; large amounts basalt stone.

Analytical data:

Depth	1:5 soil/water			Particle size %				pH 7.0 Aqueous Cations meq%					BAR %	D.R	Total Element %	%	%	%		
(cm)	pH	dS/m EC	% Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-20	6.5	0.04	0.007	15	12	28	34	34.4	23.6	9.2	0.1	1.50	30	0.58	0.271	N/A	N/A	<1	2.6	151
22-40	7.4	0.03	0.008	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
(cm)	pH	dS/m EC	% Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	6.5	0.04	0.007	5.2	0.38	720	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Note: Total elements at 65 degrees Celsius; all other data reported at 105^{o}C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

KNOLL (MINNABILLA)

REPRESENTATIVE SOIL PROFILE

Location:	246600 mE 6890800 mN Zone 56	**Site No:**	MWD 103
Landform element:	Hillcrest	**Microrelief description:**	Absent
Landform pattern:	Rolling low hills	**Permeability:**	Moderately permeable
Slope:	10-20%	**Drainage:**	Moderately well drained
Great Soil Group:	Lithosol	**Substrate lithology:**	Sandstone
Principal Profile Form:	Um1.4	**Surface coarse fragments:**	Common sandstone
Australian Soil Classification:	Paralithic, Leptic Rudosol	**Surface condition:**	Firm to hardsetting
Disturbance:	Grazing		
Vegetation:	Forest. *Eucalyptus fibrosa* subsp. *nubila*, *Callitris glaucophylla*, *Acacia* spp.		

Profile Morphology:

Horizon	Depth	Description
A1	0 to 0.45 m	Very dark greyish brown (10YR 3/2) moist; loam; massive; abundant 60-200mm sub-angular sandstone cobbles; dry, moderately weak; Abrupt to-
C	0.45 m +	Weathered sandstone and siltstone.

Analytical Data:

Depth	1:5 soil/water			Particle size				pH 7.0 Aqueous Cations					BAR	D.R	Total Element					
		dS/m	%	%				meq%					%		(%)			%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	4.6	N/A	0.007	23	37	11	28	13	N/A	N/A	<0.1	0.30	NA	NA	N/A	N/A	N/A	N/A	N/A	N/A
20-30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
		dS/m	%										
(cm)	pH	EC	Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	N/A	N/A	N/A	1.8	0.12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Status reported in cmol (+) kg^{-1} clay
N/A – Not Available
Note: This is the Minnabilla profile from the Murilla, Tara and Chinchilla Shires Manual.

KUPUNN (virgin site)

REPRESENTATIVE SOIL PROFILE

Location:	206100 mE 7018750 mN Zone 56	**Site No:**	MWD 17
Landform element:	Plain	**Microrelief description:**	Absent
Landform pattern:	Alluvial plain	**Permeability:**	Slowly permeable
Slope:	0-1%	**Drainage:**	Poorly drained
Great Soil Group:	Grey clay	**Substrate lithology:**	Unidentified sedimentary clays
Principal Profile Form:	Ug5.25	**Surface coarse fragments:**	Absents
Australian Soil Classification:	Epihypersodic, Self-mulching, Grey Vertosol	**Surface condition:**	Periodic cracking, self-mulching
Disturbance:	Grazing		
Vegetation:	Open forest. *Acacia harpophylla*, *Casuarina cristata*, *Geijera parviflora*, *Santalum lanceolatum*		

Profile Morphology:

Horizon	Depth	Description
A1	0 to 0.05 m	Dark greyish brown (10YR 4/2) moist; light medium clay; weak 10-20mm sub-angular blocky; dry, weak; rough ped fabric; abrupt to-
B21	0.05 to 0.20 m	Dark greyish brown (10YR 4/2) moist; light medium clay; strong 20-50mm angular blocky; smooth ped fabric; dry, very strong; few soft 2-6mm calcareous segregations.
B22c	0.20 to 0.70 m	Greyish brown (10YR 5/2) moist; medium clay; moderate 50-100mm angular blocky and lenticular; dry, very strong; few soft calcareous segregations; very few, 10-20mm ferro-manganiferous concretions; clear to-
B23c	0.70 to 1.20 m	Brown (7.5YR 4/3) moist; medium heavy clay; weak 50-100 mm angular blocky; few 2-20 mm calcareous nodules; very few, 2-6mm ferro-manganiferous concretions; gradual to-
B24	1 20 to 1.50 m	Strong brown (7.5YR 4/6) moist; 5% faint grey mottle; medium heavy clay; weak 50-100mm angular blocky; slickensides; dry, very strong.

Laboratory Data:

Depth	1:5 soil/water			Particle size %				pH 8.5 Alcoholic Cations meq%					BAR %	D.R	Total Element (%)			%		
(cm)	pH	dS/m EC	% Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	8.5	0.11	0.001	93	39	10	45	24.0	20.0	4.6	0.3	0.61	13	0.40	0.032	0.229	0.047	1	4.34	57
20-30	9.2	0.23	0.004	13	33	13	44	21.0	14.0	7.2	2.3	0.14	14	0.61	0.023	0.138	0.052	11	1.94	54
50-60	9.1	0.88	0.079	11	33	11	46	20.0	9.9	8.8	5.1	0.12	16	0.77	0.018	0.140	0.075	26	1.13	52
80-90	9.0	1.00	0.086	9	32	12	50	21.0	9.3	9.7	5.9	0.13	17	0.86	0.017	0.139	0.072	28	0.96	50
110-120	8.6	1.20	0.117	7	32	11	53	22.0	8.5	10.0	6.0	0.13	N/A	N/A	0.016	0.126	0.065	27	0.85	46
140-150	5.3	1.10	0.117	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
(cm)	pH	dS/m EC	% Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	8.7	0.09	0.001	0.8	0.06	N/A	11	0.56	7	5	0.5	0.3	N/A

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

KUPUNN (farmed site)

REPRESENTATIVE SOIL PROFILE

Location:	779000 mE 7010000 mN Zone 55	**Site No:**	MWD 33
Landform element:	Plain	**Microrelief description:**	Absent
Landform pattern:	Alluvial plain	**Permeability:**	Slowly permeable
Slope:	0-1%	**Drainage:**	Poorly drained
Great Soil Group:	Grey clay	**Substrate lithology:**	Unidentified sedimentary clays
Principal Profile Form:	Ug5.24	**Surface coarse fragments:**	Absent
Australian Soil Classification:	Endohypersodic, Self-mulching, Grey Vertosol	**Surface condition:**	Periodic cracking, self-mulching
Disturbance:	Cleared		
Vegetation:	Forest. *Acacia harpophylla* (in undisturbed areas)		

Profile Morphology:

Horizon	Depth	Description
A1	0 to 0.10 m	Brown (7.5YR 4/2) moist; light clay; strong 10-20mm sub-angular blocky; sharp to-
B21	0.10 to 0.50 m	Dark greyish brown (10YR 4/2) moist; medium heavy clay; weak 50-100mm sub-angular blocky. clear to-
B22k	0.50 to 0.80 m	Yellowish brown (10YR 5/4) moist; medium clay; weak angular blocky; common soft calcareous segregations; gradual to-
B23	0.80 to 1.20	Light yellowish brown (10YR 6/4) moist; 5% faint orange mottle, medium heavy clay; massive; few soft carbonate segregations.

Analytical Data:

Depth	1:5 soil/water			Particle size				pH 8.5 Alcoholic Cations					BAR	D.R	Total Element					
		dS/m	%	%				meq%					%		(%)			%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	7.2	0.09	0.001	20	35	3	17	18.0	12	3.0	0.5	0.57	10	0.38	0.031	0.274	0.041	3	4.00	95
20-30	7.5	0.10	0.001	20	34	5	36	N/A	N/A	N/A	N/A	N/A	12	0.52	0.020	0.240	0.034	N/A	N/A	N/A
50-60	8.6	0.13	0.001	21	22	5	46	18.0	7.1	6.6	2.9	0.14	12	0.88	0.020	0.236	0.035	16	1.07	36
80-90	9.6	0.35	0.001	20	19	20	43	19.0	6.3	7.8	5.2	0.11	16	0.98	0.017	0.244	0.040	27	0.80	45
110-120	9.7	0.45	0.003	20	44	5	31	19.0	5.1	7.8	6.3	0.10	N/A	N/A	0.015	0.225	0.043	33	0.65	62

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
		dS/m	%										
(cm)	pH	EC	Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	7.2	0.07	0.002	1.0	0.07	N/A	18	0.61	12	4	0.5	0.2	N/A

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

KURUMBUL

REPRESENTATIVE SOIL PROFILE

Location:	263400 mE 6831700 mN Zone 56	**Site No:**	WLM 3
Landform element:	Plain	**Microrelief description:**	Gilgai
Landform pattern:	Level plain	**Microrelief component:**	Mound
Slope:	0%	**Permeability:**	Slowly permeable
Great Soil Group:	No suitable group affinities with solodic soils or grey clays	**Drainage:**	Poorly drained
Principal Profile Form:	Dy2.33	**Substrate lithology:**	Transported material (clay sheets)
Australian Soil Classification:	Gypsic, Subnatric, Grey Sodosol	**Surface coarse fragments:**	Absent
Disturbance:	Grazing	**Surface condition:**	Occasional periodic cracking; hardsetting

Vegetation: Tall open forest. *Casuarina cristata* with an understorey of shrubs; occasional *Acacia harpophylla*, *Eucalyptus populnea* or *E. moluccana.*

Profile Morphology:

Horizon	Depth	Description
A1	0 to 0.06 m	Dark brown (10YR3/3) moist; clay loam; very few small 2-6mm sub-angular quartz pebbles; weak 20-50mm angular blocky, parting to moderate 2-5mm granular; dry, moderately weak; sharp to-
A2j	0.06 to 0.07 m	Dark brown (10YR3/3) moist; clay loam; very few small 2-6mm sub-angular quartz pebbles; weak 20-50mm angular blocky, parting to moderate 2-5mm granular; dry, moderately weak; sporadically bleached; sharp to-
B21t	0.07 to 0.15 m	Brownish black (10YR3/2) moist; heavy clay; very few small 2-6mm sub-angular quartz pebbles; moderate 20-50mm angular blocky; dry, moderately strong; abrupt to-
B22t	0.15 to 0.30 m	Greyish yellow-brown (10YR4/2) moist; heavy clay; very few small 2-6mm sub-angular quartz pebbles; strong 20-50mm angular blocky; dry, very strong; few, medium 2-6mm soft carbonate segregations; clear to-
B23t	0.30 to 0.60 m	Greyish yellow-brown (10YR4/2) moist; heavy clay; very few small 2-6mm sub-angular quartz pebbles; strong 20-50mm prismatic; dry, very strong; few coarse 6-20mm soft carbonate segregations; clear to-
B24ty	0.60 to 0.82 m	Greyish yellow-brown (10YR5/2) moist; heavy clay; very few small 2-6mm sub-angular quartz pebbles; strong 50-100mm angular blocky, parting to moderate 10-20mm angular blocky; dry, very strong; many, medium 2-6mm gypseous crystals, few, medium 2-6mm soft carbonate segregations; abrupt to-
B25tc	0.82 to 0.87 m	Greyish yellow-brown (10YR6/2) moist; heavy clay; very few small 2-6mm sub-angular quartz pebbles; strong 50-100mm angular blocky; dry, very strong; many, medium 2-6mm soft manganiferous segregations, few, medium 2-6mm gypseous crystals; abrupt to-
B26t	0.87 to 1.50 m	Greyish yellow-brown (10YR6/2) moist; heavy clay; very few small 2-6mm sub-angular quartz pebbles; moderate 200-500mm prismatic, moderate 100-200mm lenticular; dry, very strong; very few, medium 2-6mm gypseous crystals.

Analytical Data:

Depth	1:5 soil/water			Particle size				pH 7.0 Aqueous Cations					BAR	D.R						
		dS/m	%	%				meq%					%		(%)			%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
10	7.1	0.1	0.001	22	37	16	25	22.0	14.0	3.3	0.2	1.20	11	0.54	0.042	0.590	0.048	1	4.24	75
30	9.3	0.3	0.013	16	28	14	42	31.0	14.0	11.0	3.8	0.72	17	0.73	0.014	0.460	0.028	12	1.27	70
60	9.1	0.9	0.055	16	25	16	44	32.0	11.0	14.0	7.1	0.57	18	0.87	0.410	0.049	0.042	22	0.78	72
90	8.1	1.8	0.067	13	23	16	46	33.0	10.0	15.0	7.8	0.38	19	0.87	0.008	0.454	0.168	24	0.66	72
120	5.9	1.4	0.061	13	23	16	47	31.0	9.1	13.0	7.2	0.27	N/A	N/A	0.007	0.464	0.131	N/A	0.7	63

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
		dS/m	%										
(cm)	pH	EC	Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	7.4	0.15	0.004	1.5	0.11	19	13	1.10	27	65	0.8	0.6	N/A

LANGLANDS (Mound)

REPRESENTATIVE SOIL PROFILE

Location:	301500 mE 7042180 mN Zone 56	**Site No:**	SPFD 51 Observation 1
Landform element:	Plain	**Microrelief description:**	Melonhole gilgai; Horizontal interval 10m; Vertical interval 0.5m
Landform pattern:	Level plain	**Microrelief component:**	Mound
Slope:	0.5%	**Permeability:**	Slowly permeable
Great Soil Group:	Brown clay	**Drainage:**	Imperfectly drained
Principal Profile Form:	Ug5.34	**Substrate lithology:**	Unidentified sedimentary clays
Australian Soil Classification:	Epihypersodic-Acidic, Epipedal, Brown Vertosol	**Surface coarse fragments:**	Absent
Disturbance:	Cleared	**Surface condition:**	Periodic cracking, weakly self-mulching
Vegetation:	Forest. *Acacia harpophylla* (in undisturbed areas)		

Profile Morphology:

Horizon	Depth	Description
A1	0 to 0.05 m	Greyish yellow-brown (10YR4/2) moist, greyish yellow-brown (10YR4/2) dry; light clay; strong 5-10mm angular blocky; dry, moderately strong; field pH 7.5; clear to-
B21	0.05 to 0.40 m	Dull yellowish brown (10YR5/3) moist; medium clay; strong 10-20mm lenticular, strong 5-10mm lenticular; few <5mm calcareous concretions; moderately moist, very firm; field pH 9; gradual to-
B22	0.40 to 0.70 m	Dull yellowish orange (10YR6/3) moist; medium clay; moderate 10-20mm lenticular; few <5 mm calcareous concretions; moderately moist, very firm; field pH 9; gradual to-
B23	0.70 to 1.60 m	Dull yellowish orange (10YR6/3) moist; medium clay; moderate 10-20mm angular blocky, moderate 5-10mm lenticular; dry, moderately strong; field pH 6-5.5.

Analytical data:

Depth	1:5 soil/water			Particle size				pH 8.5 Alcoholic Cations					BAR	D.R	Total Element					
		dS/m	%	%				meq%					%		%	%	%	%		
(cm)	pH	EC	Cl	CS	FS	Sl	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	8.9	0.18	0.001	5	24	20	53	36.6	28.0	9.7	2.4	0.50	22	0.32	0.040	0.358	0.049	7	2.90	77
20-30	9.2	0.58	0.044	5	21	14	59	36.5	20.4	12.9	6.8	0.24	22	0.68	0.024	0.318	0.050	19	1.60	68
50-60	8.3	2.50	0.156	5	24	14	59	33.4	16.1	14	10.8	0.22	22	0.59	0.019	0.307	0.207	32	1.20	70
80-90	7.5	1.30	0.161	5	24	14	58	34.0	11.7	12.8	11.7	0.24	21	0.92	0.015	0.287	0.056	34	0.92	63
110-120	5.9	1.40	0.183	5	23	11	62	37.5	10.7	13.9	11.8	0.24	N/A	N/A	0.016	0.321	0.053	31	0.77	59
140-150	6.1	1.40	0.193	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
		DS/m	%										
(cm)	pH	EC	Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	8.7	0.14	BQ	1.7	0.18	16	10	0.38	9	6	0.8	0.1	5

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

LANGLANDS (Depression)

REPRESENTATIVE SOIL PROFILE

Location: 301510 mE 7042175 mN Zone 56
Site No: SPFD 51 Observation 2
Landform element: Plain
Microrelief description: Melonhole gilgai; Horizontal interval 10m; Vertical interval 0.5m
Landform pattern: Level plain
Microrelief component: Depression
Slope: 0.5%
Permeability: Slowly permeable
Great Soil Group: Grey clay
Drainage: Imperfectly drained
Principal Profile Form: Ug5.24
Substrate lithology: Unidentified sedimentary clays
Australian Soil Classification: Epihypersodic, Self-mulching, Grey Vertosol
Surface coarse fragments: Absent
Disturbance: Cleared
Surface condition: Periodic cracking, self-mulching surface
Vegetation: Forest. *Acacia harpophylla* (in undisturbed areas)

Profile Morphology:

Horizon	Depth	Description
A1	0 to 0.05 m	Brownish grey (10YR4/1) moist, brownish grey (10YR5/1) dry; light clay; field pH 9; clear to-
B21	0.05 to 0.35 m	Brownish grey (10YR5/1) moist; few fine faint orange mottles; heavy clay; very few medium 2-6mm calcareous concretions; field pH 9; gradual to-
B22c	0.35 to 1.00 m	Brownish grey (10YR5/1) moist; heavy clay; very few medium 2-6mm manganiferous nodules; field pH 9; gradual to-
B23	1.00 to 1.60 m	Brownish grey (10YR5/1) moist, greyish yellow-brown (10YR5/2) moist; medium heavy clay; field pH 9.

Analytical data:

	1:5 soil/water			Particle size				pH 8.5 Alcoholic Cations					BAR	D.R	Total Element					
Depth		dS/m	%	%				meq%					%		%	%	%	%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	8.5	0.14	0.001	6	24	17	52	40.9	31.2	6.6	0.9	0.59	21	0.51	0.033	0.370	0.033	2	4.80	75
20-30	9.1	0.15	0.002	4	26	14	55	38.9	29.2	7.6	2.6	0.31	22	0.69	0.024	0.352	0.025	7	3.90	72
50-60	9.3	0.31	0.013	6	26	13	55	38.5	21.4	10.3	6.1	0.34	22	0.89	0.022	0.339	0.026	16	2.10	69
80-90	9.1	0.79	0.091	8	29	13	52	35.2	16.0	11.7	9.3	0.31	21	0.96	0.021	0.324	0.034	26	1.36	72
110-120	9.1	1.00	0.116	7	31	13	51	33.0	12.8	10.6	10.6	0.30	N/A	N/A	0.020	0.310	0.039	32	1.20	67
140-150	9.0	1.20	0.141	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

	1:5 soil/water								DTPA extract.				
		dS/m	%	%	%	P mg/kg		meq%	mg/kg				mg/kg
Depth	pH	EC	Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	7.3	0.14	0.004	2.5	0.26	33	47	0.85	68	13	2.6	0.5	16

Note: Total elements at 65 degrees Celsius; all other data reported at 105^{o}C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available
BQ – Below Quantifiable Level

LEYBURN

REPRESENTATIVE SOIL PROFILE

Location:	359500 mE 6982600 mN Zone 56	**Site No:**	SRM 12
Landform element:	Plain	**Microrelief description:**	Absent
Landform pattern:	Alluvial plain	**Permeability:**	Very slowly permeable
Slope:	<0.5%	**Drainage:**	Poorly drained
Great Soil Group:	Solodic	**Substrate lithology:**	Alluvium
Principal Profile Form:	Dy2.42	**Surface coarse fragments:**	Absent
Australian Soil Classification:	Eutrophic, Subnatric, Brown Sodosol	**Surface condition:**	Hardsetting
Disturbance:	Grazing		
Vegetation:	Woodland. *Eucalyptus melliodora*, *E. tereticornis*, *E. microcarpa*, *Cassinia laevis*		

Profile Morphology:

Horizon	Depth	Description
A1	0 to 0.05 m	Dark yellowish brown (10YR 4/4) moist; fine sandy clay loam; weak 5-10mm granular structure; dry, firm; clear to-
A2e	0.05 to 0.20 m	Brown (10YR 5/3 moist, 10YR 8/2 dry) conspicuous bleach, clay loam; massive; dry, very firm; abrupt to-
B21	0.20 to 0.60 m	Yellowish brown (10YR 5/4) moist; medium clay; weak 20-50mm angular blocky; dry, strong; gradual to-
B22	0.60 to 1.10 m	Yellowish brown (10YR 5/4) moist; medium clay; massive; dry, strong.

Analytical Data:

Depth	1:5 soil/water			Particle size				pH 7.0 Aqueous Cations					BAR	D.R	Total Element					
		dS/m	%	%				meq%					%		(%)			%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	7.0	0.03	0.001	5	53	28	16	7.0	3.4	2.7	0.5	0.25	6	0.64	0.024	1.470	0.017	1	1.25	43
20-30	6.1	0.07	0.004	4	37	34	28	19.0	6.5	9.6	2.3	0.21	8	0.77	0.013	1.790	0.011	8	0.67	66
50-60	6.8	0.42	0.061	3	27	35	36	32.0	15.0	12.0	5.0	0.19	12	0.88	0.009	2.210	0.006	21	1.25	89
80-90	7.2	0.52	0.073	3	40	28	29	27.0	8.3	11.0	7.0	0.22	9	0.86	0.009	2.050	0.005	25	0.75	91
100-110	7.7	0.19	0.025	N/A	N/A	N/A	N/A	8.0	2.7	3.7	1.8	0.25	N/A	N/A	N/A	N/A	N/A	23	0.73	N/A

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
		dS/m	%										
(cm)	pH	EC	Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	6.0	0.03	0.007	1.4	0.07	6.0	14	0.63	61	69	0.5	4.8	N/A

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

MALLARD

REPRESENTATIVE SOIL PROFILE

Location:	364825 mE 6946159 mN Zone 56	**Site No:**	MCD 113
Landform element:	Hillslope	**Microrelief description:**	Absent
Landform pattern:	Undulating plains	**Permeability:**	Slowly permeable
Slope:	5%	**Drainage:**	Imperfectly drained
Great Soil Group:	No suitable group	**Substrate lithology:**	Basalt
Principal Profile Form:	Ug5.12	**Surface coarse fragments:**	Absent
Australian Soil Classification:	Halpic, Eutrophic, Black Dermosol	**Surface condition:**	Cracking
Disturbance:	Grazing		
Vegetation:	Open woodland. *Eucalyptus orgadophila*		

Profile Morphology:

Horizon	Depth	Description
A1p	0 to 0.08 m	Brownish black (7.5YR3/2) moist; medium clay; weak 2-5mm field pH 7
B2t	0.08 to 0.25 m	Brownish black (7.5YR2/2) moist; medium heavy clay; many medium 6-20mm sub-angular basalt pebbles; strong 5-10mm angular blocky; very few, soft <5mm calcareous segregations; field pH 7.5; abrupt to-
B3	0.25 to 0.33 m	Bright brown (7.5YR5/6) moist; abundant medium 6-20mm sub-angular basalt pebbles; weak 5-10mm angular blocky; very few, <5mm soft calcareous segregations; field pH 8.5; gradual to-

Analytical data:

Depth	1:5 soil/water			Particle size				pH 7.0 Aqueous Cations					BAR	D.R	Total Element					
		dS/m	%	%				meq%					%		%	%	%	%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	7.3	0.04	0.001	4	22	19	51	56.3	36.1	9.1	0.2	1.17	23	0.41	0.129	0.910	0.023	<1	4.00	91
10-20	7.4	0.06	0.001	12	20	15	49	58.8	39.5	8.9	0.3	0.94	25	0.42	0.154	0.906	0.021	1	4.50	101
20-30	8.1	0.21	0.001	17	13	11	56	56.6	46.0	9.2	0.3	0.64	28	0.32	0.145	0.661	0.030	1	5.00	100

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
		dS/m	%										
(cm)	pH	EC	Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
0-10	7.3	0.04	0.001	1.7	0.10	450	72	1.01	27	37	2.1	0.6	4

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

Note: While this representative profile keys out as black (due to the colour of the upper part of the profile) the soil is more commonly brown in colour.

MIDDLE RIDGE

REPRESENTATIVE SOIL PROFILE

Location: 395725 mE 6945175 mN Zone 56
Site No: B 210
Landform element: Hillslope
Microrelief description: Absent
Landform pattern: Undulating plains
Permeability: Highly permeable
Slope: Unknown
Drainage: Very well drained
Great Soil Group: Krasnozem
Substrate lithology: Undescribed basaltic material
Principal Profile Form: Uf6.31
Surface coarse fragments: Absent
Australian Soil Classification: Ferric, Eutrophic, Red Ferrosol
Surface condition: Soft
Disturbance: Unknown
Vegetation: Unknown

Profile Morphology:

Horizon	Depth	Description
A1	0 to 0.15 m	Dark reddish brown (5YR 3/4) moist; light clay; moderate granular parting to fine sub-angular blocky; clear to-
B21	0.15 to 0.25 m	Red-brown (2.5YR3/6) moist; heavy clay; moderate fine blocky; moist, firm; few 2-20mm lateritic nodules:
B22	0.25 to 0.47 m	Brownish red (2.5YR4/6) moist; heavy clay; moderate fine blocky; moist, firm; few 2-20mm lateritic nodules; diffuse to-
B23	0.47 to 1.87 m	Red (1YR4/6) moist; heavy clay; moderate fine blocky, few increasing to very many 6-20mm lateritic fragments and nodules; diffuse to-
B24	1.87 to 2.77 m	Red and yellow-red; medium clay; moderate fine blocky, few increasing to very many 6-20mm lateritic fragments and nodules; diffuse to-
BC	3.00 to 3.60 m	Red, yellow-grey and yellow-brown; light clay; lateritic fragments and “pipe” structures.

Analytical data:

Depth	1:5 soil/water			Particle size				pH 7.0 Aqueous Cations					BAR	D.R	Total Element					
		dS/m	%	%				meq%					%		%	%	%	%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-15	6.3	0.01	0.009	8	16	18	55	20.4	15.6	4.6	0.1	0.13	N/A	N/A	0.110	N/A	N/A	1	3.40	75
25-47	6.6	0.01	0.005	5	12	4	73	11.5	7.7	3.5	0.1	0.04	N/A	N/A	N/A	N/A	N/A	1	2.20	31
72-127	6.1	0.01	0.003	14	14	9	66	6.0	3.2	2.8	<0.1	0.02	N/A	N/A	N/A	N/A	N/A	<1	1.10	22
187-277	5.9	0.01	0.003	5	31	18	49	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-360	6.2	0.01	0.005	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.150	N/A	N/A	N/A	N/A	N/A

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
		dS/m	%										
(cm)	pH	EC	Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
0-15	6.3	0.01	0.009	3.8	0.17	40							
15-25	6.4	0.01	0.006	2.3	0.09								
25-47	6.6	0.01	0.005	1.2	0.06								
47-72	6.5	0.01	0.004			11							
72-127	6.1	0.01	0.003	0.2									

Note: Total elements at 65 degrees Celsius; all other data reported at 105^{o}C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

MILLMERRAN

REPRESENTATIVE SOIL PROFILE

Location:	333700 mE 6915900 mN Zone 56	**Site No:**	MCD 20
Landform element:	Plain	**Microrelief description:**	Absent
Landform pattern:	Alluvial pain	**Permeability:**	Slowly permeable
Slope:	1%	**Drainage:**	Imperfectly drained
Great Soil Group:	Grey clay	**Substrate lithology:**	Alluvium
Principal Profile Form:	Ug5.24	**Surface coarse fragments:**	Absent
Australian Soil Classification:	Haplic, Epipedal, Grey Vertosol	**Surface condition:**	Surface flake, cracking
Disturbance:	Grazing		
Vegetation:	Woodland. *Eucalyptus populnea, Eucalyptus tereticornis*		

Profile Morphology:

Horizon	Depth	Description
A1	0 to 0.10 m	Very dark brown (10YR2/2) moist; fine sandy light clay; weak 5-10mm prismatic; field pH 5.5; clear to-
A2j	0.10 to 0.15 m	Light grey (10YR7/1) moist; light clay; few medium 6-20mm pebbles, rounded ironstone; moderate 10-20mm prismatic; field pH 5.5; clear to-
B21t	0.15 to 0.40 m	Dark grey (10YR4/1) moist; medium heavy clay; strong 50-100mm prismatic; field pH 5.5; gradual to-
B22tc	0.40 to 0.70 m	Greyish brown (10YR5/2) moist; medium heavy clay; strong 20-50mm lenticular; few medium 2-6mm manganiferous nodules; field pH 5.5 to 6.8; gradual to-
B23t	0.70 to 0.90 m	Greyish brown (10YR5/2) moist; common medium faint brown mottles; medium heavy clay; moderate 50-100mm lenticular; few coarse 6-20mm calcareous concretions; field pH 6.8 to 8; gradual to-
B24t	0.90 to 1.30 m	Light brownish grey (10YR6/2) moist; few fine faint yellow mottles; moderate 50-100mm lenticular; few coarse 6-20mm calcareous concretions; field pH 8 to 8.5.

Analytical data:

	1:5 soil/water			Particle size				pH 8.5 Alcoholic Cations					BAR	D.R	Total Element					
Depth		dS/m	%	%				meq%					%		%	%	%	%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	6.1	0.06	0.002	14	32	22	31	18.4	6.7	3.9	0.5	0.37	13	49.00	0.039	0.419	0.032	3	1.70	37
20-30	7.0	0.14	0.011	9	23	22	47	27.7	12.3	7.9	2.2	0.20	19	90.00	0.014	0.335	0.012	8	1.60	48
50-60	7.8	0.37	0.044	9	20	18	54	29.9	15.5	9.7	3.2	0.20	21	71.00	0.011	0.357	0.015	11	1.60	53
80-90	8.3	0.34	0.039	11	24	15	50	29.8	14.4	9.2	2.9	0.23	19	96.00	0.010	0.438	0.015	10	1.60	53
110-120	8.9	0.36	0.025	12	26	14	48	31.9	17.5	11.3	3.2	0.30	N/A	N/A	0.011	0.464	0.023	10	1.50	67

	1:5 soil/water								DTPA extract.				
Depth		dS/m	%	%	%	P mg/kg		meq%	mg/kg				mg/kg
(cm)	pH	EC	Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	6.1	0.06	0.002	2.3	0.25	20	13	1.60	104	94	1.2	2.1	7

Note: Total elements at 65 degrees Celsius; all other data reported at 105^{o}C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

MOOLA

REPRESENTATIVE SOIL PROFILE

Location:	283250 mE 7060850 mN Zone 56	**Site No.**	MWD 23
Landform element:	Footslope	**Microrelief description:**	Absent
Landform pattern:	Undulating low hills	**Permeability:**	Slowly permeable
Slope:	3%	**Drainage:**	Imperfectly drained
Great Soil Group:	Grey clay	**Substrate lithology:**	Sandstone (argillaceous)
Principal Profile Form:	Ug5.23	**Surface coarse fragments:**	Absent
Australian Soil Classification: Endohypersodic, Pedal, Grey Vertosol		**Surface condition:**	Periodic cracking, soft
Disturbance:	Grazing		
Vegetation:	Open forest. *Acacia harpophylla*, *Casuarina cristata*, *Geijera parviflora*		

Profile Morphology:

Horizon	Depth	Description
A1	0 to 0.20 m	Dark brown (7.5YR 3/2) moist; light clay; moderate 5-20 mm sub-angular blocky; dry, firm; few 2-10mm ironstone fragments; abrupt to-
B21	0.20 to 0.60 m	Dark greyish brown (10YR 4/2) moist; medium heavy clay; strong 20-50 mm angular blocky; dry, very firm; few 2-10mm ironstone; gradual to:
B22	0.60 to 1.00 m	Dark yellowish brown (10YR 4/4) moist; medium clay; strong 20-100 mm angular blocky; very few 2-6mm calcareous nodules; few 6-20mm soft calcareous segregations; few 6-20mm ferro-manganiferous nodules; gradual to:
B3	1.00 to 1.60 m	Pale yellow (2.5YR 7/4) moist; very few fine distinct mottles; light clay; very few 6-20mm ferro-manganiferous nodules; very few, sandstone coarse fragments; dry, strong.

Analytical data:

	1:5 soil/water			Particle size				pH 8.5 Alcoholic Cations					BAR	D.R	Total Element					
Depth		dS/m	%	%				meq%					%		%	%	%	%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	6.0	0.14	0.005	15	39	13	38	32.0	12.0	4.9	0.2	1.40	12	0.31	0.092	0.981	0.070	1	2.44	49
20-30	8.3	0.33	0.032	9	30	9	56	38.0	13.0	13.0	4.5	0.57	13	0.64	0.039	0.793	0.045	12	1.00	55
50-60	8.7	0.85	0.097	11	33	9	52	34.0	8.5	14.0	6.8	0.29	17	0.83	0.039	0.800	0.048	20	0.61	57
80-90	9.0	1.30	0.137	10	31	12	48	31.0	6.0	15.0	8.5	0.28	18	0.95	0.031	0.850	0.053	27	0.40	62
110-120	9.2	1.00	0.101	7	29	15	51	34.0	4.6	17.0	9.5	0.33	N/A	N/A	0.025	1.18	0.030	28	0.27	62
140-150	8.7	1.10	0.124	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

	1:5 soil/water								DTPA extract.				
Depth		dS/m	%	%	%	P mg/kg		meq%	mg/kg				mg/kg
(cm)	pH	EC	Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	5.4	0.20	0.010	3.6	0.29	N/A	112	2.10	157	87	1.1	7.0	N/A

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

MOOLA

REPRESENTATIVE SOIL PROFILE

Location: 353500 mE 699200[$] mN Zone 56
Site No: WHE 5
Landform element: Hillslope
Microrelief description: Absent
Landform pattern: Steep low hills
Permeability: Slowly permeable
Slope: 1.5%
Drainage: Imperfectly drained
Great Soil Group: Grey clay
Substrate lithology: Sandstone (argillaceous)
Principal Profile Form: Ug5.16
Surface coarse fragments: Absent
Australian Soil Classification: Endohypersodic, Crusty, Black Vertosol
Surface condition: Crusting, periodic cracking
Disturbance: Grazing
Vegetation: Forest. *Acacia harpophylla, Geijera parviflora*

Profile Morphology:

Horizon	Depth	Description
Ap1	0 to 0.08 m	Brownish black (10YR3/2) moist; fine sandy clay; moderate 20-50mm granular; dry, very firm; field pH 9. clear to-
Ap2	0.08 to 0.20 m	Brownish black (10YR3/2) moist; fine sandy light medium clay; moderate 50-100mm clod; dry, moderately strong; gradual to-
B21	0.20 to 0.30 m	Brownish black (10YR3/2) moist; medium clay; weak 50-100mm angular blocky; dry, moderately strong; field pH 9; clear to-
B22k	0.30 to 0.60 m	Brownish black (10YR3/2) moist; medium clay; weak 50-100mm angular blocky; common medium 2-6mm soft calcareous segregations; dry, moderately strong; field pH 9; clear to-
B23	0.60to 0.90 m	Dull yellowish brown (10YR5/3) moist; medium clay; weak 10-20mm polyhedral, moderate 20-50mm polyhedral; moist, moderately weak; field pH 9; diffuse to-
B24	0.90 to 1.50 m	Dull brown (7.5YR5/4) moist; medium clay; moderate 20-50mm polyhedral; moderately moist, moderately firm; diffuse to-
C	1.50 to 1.70 m	Dull orange (7.5YR6/4) moist; fine sandy clay; moderately moist, moderately weak.

Analytical data:

	1:5 soil/water			Particle size				pH 8.5 Alcoholic Cations					BAR	D.R	Total Element					
Depth		dS/m	%	%				meq%					%		%	%	%	%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
B0-10	8.7	0.16	0.001	6	41	10	43	36.9	30.4	6.1	1.6	0.80	N/A	N/A	0.050	0.840	0.030	4	5.00	90
0-10	8.6	0.23	0.006	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	17	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10-20	8.8	0.25	0.004	5	38	9	46	40.4	24.9	8.4	3.01	0.50	19	0.51	N/A	N/A	N/A	7.4	3.00	80
20-30	9.0	0.32	0.008	5	35	9	48	41.6	23.9	11.4	4.8	0.46	21	0.62	N/A	N/A	N/A	12	2.10	85
30-40	9.0	0.43	0.014	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
40-50	9.1	0.57	0.027	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
50-60	9.0	0.79	0.047	4	30	9	51	41.3	17.6	14.5	9.1	0.51	N/A	0.92	N/A	N/A	N/A	22	1.20	82
60-70	8.8	1.06	0.062	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	23	N/A	N/A	N/A	N/A	N/A	N/A	N/A
70-80	8.7	1.30	0.075	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
80-90	8.6	1.27	0.100	3	29	10	55	40.5	14.6	14.5	10.4	0.46	23	0.98	N/A	N/A	N/A	26	1.00	73
90-100	7.6	1.23	0.110	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
100-110	6.6	1.23	0.116	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	23	N/A	N/A	N/A	N/A	N/A	N/A	N/A
110-120	5.8	1.21	0.121	2	31	10	53	43.6	13.5	14.5	11.4	0.43	23	0.99	N/A	N/A	N/A	26	1.90	75
120-130	5.4	1.26	0.132	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	24	N/A	N/A	N/A	N/A	N/A	N/A	N/A
130-140	5.2	1.25	0.134	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
140-150	5.0	1.25	0.140	4	29	11	53	41.3	11.4	13.4	10.3	0.37	23	0.93	N/A	N/A	N/A	25	0.80	67

	1:5 soil/water								DTPA extract.				
Depth		dS/m	%	%	%	P mg/kg		meq%	mg/kg				mg/kg
(cm)	pH	EC	Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	8.7	0.16	0.001	1.1	0.05	23	6	0.69	11	7	0.9	0.2	N/A

$ approximate position only

MORUYA

REPRESENTATIVE SOIL PROFILE

Location:	224800 mE 6879800 mN Zone 56	**Site No:**	WLM 18
Landform element:	Hillslope	**Microrelief description:**	Absent
Landform pattern:	Gently undulating rises	**Permeability:**	Slowly permeable
Slope:	2%	**Drainage:**	Imperfectly drained
Great Soil Group:	Red brown earth (affinities with solodic soils)	**Substrate lithology:**	Labile sedimentary rocks
Principal Profile Form:	Dr2.43	**Surface coarse fragments:**	Absent
Australian Soil Classification:	Eutrophic, Subnatric, Red Sodosol	**Surface condition:**	Hardsetting
Disturbance:	Grazing		
Vegetation:	Tall open forest. *Casuarina cristata*, *Acacia harpophylla* and an understorey of shrubs		

Profile Morphology:

Horizon	Depth	Description
A1	0 to 0.07 m	Dark brown (7.5YR3/3) moist; fine sandy loam; massive; dry, moderately weak; abrupt to-
A2e	0.07 to 0.14 m	Dull reddish brown (5YR7/4) moist; dull orange (5YR7/4) dry; fine sandy clay loam; massive; dry, moderately firm; sharp to-
B21t	0.14 to 0.50 m	Dark reddish brown (5YR3/4) moist; medium clay; moderate 100-200mm prismatic, parting to strong 20-50mm angular blocky; dry, moderately strong; very few, medium 2-6mm soft carbonate segregations; clear to-
B22tk	0.50 to 0.80 m	Reddish brown (5YR4/6) moist; medium clay; moderate 20-50mm angular blocky, parting to moderate 5-10 mm polyhedral; dry very firm; very few, medium 2-6mm carbonate nodules, common medium soft carbonate segregations; clear to-
B23	0.80 to 1.50 m	Dull reddish brown (5YR5/4) moist; very few fine distinct mottles, very few, fine, distinct grey mottles; light medium clay; moderate, 10-20mm polyhedral, parting to moderate 5-10mm polyhedral, 5-10mm cast; dry, moderately strong; very few, manganiferous veins.

Analytical Data:

Depth	1:5 soil/water			Particle size				pH 7.0 Aqueous Cations					BAR	D.R	Total Element					
		dS/m	%	%				meq%					%		(%)			%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
10	8.0	0.10	0.001	10	56	17	18	15	10	1.0	0.1	0.80	N/A	0.56	0.029	0.219	0.038	<1	10.00	66
30	8.8	0.13	0.001	5	41	13	40	24	15	4.9	1.4	0.65	N/A	0.53	0.014	0.210	0.036	6	3.06	55
60	9.4	0.23	0.003	4	42	13	40	27	12	7.3	5.0	0.56	N/A	0.87	0.013	0.197	0.021	18	1.64	62
90	9.0	0.25	0.036	14	19	20	43	29	10	7.6	8.6	0.37	N/A	1.00	0.012	0.167	0.035	30	1.31	62
120	5.6	0.92	0.118	4	41	14	41	22	7.3	6.0	7.9	0.01	N/A	N/A	0.009	0.125	0.071	36	1.22	52

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
		dS/m	%										
(cm)	pH	EC	Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	8.1	0.11	0.001	1.3	0.11	15	7	0.86	10	23	0.5	0.6	N/A

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

MURLAGGAN

REPRESENTATIVE SOIL PROFILE

Location:	355634 mE 6930807 mN Zone 56	**Site No:**	MCD 21
Landform element:	Hillslope	**Microrelief description:**	Absent
Landform pattern:	Undulating rises	**Permeability:**	Slowly permeable
Slope:	8%	**Drainage:**	Poorly drained
Great Soil Group:	Black earth	**Substrate lithology:**	Sandstone
Principal Profile Form:	Ug5.13	**Surface coarse fragments:**	Absent
Australian Soil Classification:	Endohypersodic, Self-mulching, Black Vertosol	**Surface condition:**	Cracking, self-mulching
Disturbance:	Grazing		
Vegetation:	Open woodland. *Eucalyptus orgadophila, Dichanthium sericeum, Cynodon* spp.		

Profile Morphology:

Horizon	Depth	Description
A1	0 to 0.06 m	Brownish black (10YR3/1) moist; heavy clay; strong 2-5mm granular parting to strong <2mm granular; field pH 9; clear to-
B21	0.06 to 0.30 m	Brownish black (10YR3/1) moist; heavy clay; very few small 2-6mm sub-rounded pebbles; moderate 10-20mm sub-angular blocky; very few, medium 2-6mm calcareous nodules; field pH 9; gradual to-
B22	0.30 to 0.65 m	Brownish black (10YR3/2) moist; heavy clay; few small 2-6mm sub-rounded pebbles; strong 20-50mm lenticular; few, medium 2-6mm calcareous nodules; field pH 9; abrupt to-
B23	0.65 to 1.10 m	Dull yellowish brown (10YR4/3) moist; heavy clay; moderate 50-100mm lenticular; few, coarse 6-20mm soft calcareous segregations; field pH 9-8.5

Analytical data:

Depth	1:5 soil/water			Particle size				pH 7.0 Aqueous Cations					BAR	D.R	Total Element					
		dS/m	%	%				meq%					%		%	%	%	%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	8.6	0.14	0.001	IS	IS	IS	IS	46.0	34.3	10.5	1.4	0.73	22	0.39	0.086	1.260	0.050	3	3.30	N/A
10-20	9.1	0.17	0.001	2	17	16	62	49.8	31.4	11.9	3.0	0.34	24	0.45	0.067	1.140	0.033	6	2.60	75
20-30	9.1	0.25	0.005	1	16	12	67	48.9	28.7	13.8	4.7	0.34	25	0.47	0.053	1.050	0.026	10	2.10	71
50-60	8.9	0.95	0.088	2	16	12	66	49.1	21.3	18.1	9.6	0.33	26	0.73	0.042	0.933	0.025	20	1.20	75
80-90	8.9	1.23	0.109	3	17	15	60	40.2	16.9	15.9	9.2	0.34	22	0.68	0.050	0.950	0.024	23	1.07	71
100-110	8.9	1.22	0.099	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	21	0.7	N/A	N/A	N/A	N/A	N/A	N/A

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. Mg/kg				mg/kg
		dS/m	%										
(cm)	pH	EC	Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
0-10	8.6	0.14	0.001	1.8	0.11	29	18	0.62	9	9	1.1	0.6	3.212

Note: Total elements at 65 degrees Celsius; all other data reported at 105^{o}C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available
IS – Insufficient sample

Note: This soil has been included with *Craigmore* for the purpose of the manual.

MURRA CUL CUL

REPRESENTATIVE SOIL PROFILE

Location:	234200 mE 6886900 mN Zone 56	**Site No:**	WLM 17
Landform element:	Lower slope	**Microrelief description:**	Absent
Landform pattern:	Level to gently undulating alluvial plains	**Permeability:**	Slowly permeable
Slope:	1.5%	**Drainage:**	Poorly drained
Great Soil Group:	Solodic soil	**Substrate lithology:**	Alluvium
Principal Profile Form:	Dd1.43	**Surface coarse fragments:**	Very few coarse pebbles
Australian Soil Classification:	Gypsic, Subnatric, Black Sodosol	**Surface condition:**	Hardsetting
Disturbance:	Cultivation		
Vegetation:	Tall open woodland. *Eucalyptus populnea* with occasional *Acacia pendula* or *Casuarina cristata* and an understorey of shrubs (in undisturbed areas).		

Profile Morphology:

Horizon	Depth	Description
A1	0 to 0.05 m	Dark brown (10YR3/3) moist, fine sandy clay loam; very few, coarse 6-20mm pebbles; massive; dry, very firm; abrupt to-
B2e	0.05 to 0.08 m	Greyish yellow-brown (10YR5/2) moist; dull yellowish orange (10YR7/2) dry; fine sandy clay loam; massive; dry, very firm; sharp to-
B21t	0.08 to 0.27 m	Brownish black (10YR3/2) moist; heavy clay; weak 50-100mm prismatic parting to moderate 10-20mm angular blocky; dry, moderately strong; clear to-
B22t	0.27 to 0.62 m	Brown (7.5YR4/3) moist; heavy clay; very few coarse 20-60mm rounded pebbles; moderate 20-50mm polyhedral; dry, moderately strong; very few, medium 2-6mm soft carbonate segregations, very few medium 2-6mm carbonate nodules; gradual to-
B23y	0.62 to 0.87 m	Dull brown (7.5YR5/4) moist; few medium faint grey mottles; medium clay; very few coarse 20-60mm rounded pebbles; moderate 2-5mm polyhedral; dry, very strong; many, coarse 6-20mm gypseous crystals, very few, coarse 6-20mm manganiferous veins; clear wavy to-
BC?	0.87 to 1.50 m	Bright brown (7.5YR5/6) moist; many coarse distinct grey mottles, few medium, prominent orange mottles; light medium clay; few medium 6-20mm angular tabular sandstone pebbles; moderate 5-10mm polyhedral; wet, moderately weak.

Analytical Data:

Depth	1:5 soil/water			Particle size				pH 7.0 Aqueous Cations					BAR	D.R	Total Element					
		dS/m	%	%				meq%					%		(%)			%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
10	7.2	0.05	0.003	4	59	17	19	15.0	6.8	3.3	0.5	0.48	6	0.69	0.017	0.506	0.018	3	2.06	58
30	7.9	0.92	0.116	2	30	11	57	46.0	16.0	19.0	7.2	0.54	24	0.75	0.022	0.574	0.050	16	0.84	75
60	8.5	1.60	0.167	2	34	12	53	40.0	13.0	17.0	8.3	0.50	21	0.78	0.016	0.540	0.099	21	0.76	73
90	7.5	0.38	0.068	7	20	7	57	34.0	15.0	15.0	8.0	0.49	22	0.97	0.016	0.511	3.250	24	1.00	68
120	5.8	0.24	0.007	1	35	14	48	39.0	11.0	14.0	7.5	0.54	N/A	N/A	0.020	1.070	0.159	19	0.78	69

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
		dS/m	%										
(cm)	pH	EC	Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	6.9	0.13	0.007	1.8	0.13	22	15	0.71	47	21	0.5	0.9	N/A

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

MYWYBILLA

REPRESENTATIVE SOIL PROFILE

Location: 329600 mE 6995300 mN Zone 56
Site No: WHE 6
Landform element: Plain
Microrelief description: Absent
Landform pattern: Alluvial plain
Permeability: Very slowly permeable
Slope: 0.5%
Drainage: Imperfectly drained
Great Soil Group: Black earth
Substrate lithology: Alluvium
Principal Profile Form: Ug5.16
Surface coarse fragments: Absent
Australian Soil Classification: Haplic, Self-mulching, Black Vertosol
Surface condition: Periodic cracking, self-mulching
Disturbance: Cultivation
Vegetation: Unknown

Profile Morphology:

Horizon	Depth	Description
Ap1	0 to 0.12 m	Brownish black (10YR3/1) moist; medium heavy clay; strong 5-10mm granular; dry, moderately strong; field pH 9; abrupt to-
Ap2	0.12 to 0.27 m	Brownish black (10YR3/1) moist; medium heavy clay; dry, moderately strong; field pH 8.7; clear to-
B21	0.27 to 0.90 m	Brownish black (10YR3/1) moist; medium heavy clay; moderate 10-20mm lenticular, moderate 20-50mm lenticular; moist, moderately weak; field pH 9; gradual to
B21	0.90 to 1.20 m	Brownish grey (10YR5/1) moist; few medium prominent brown mottles; medium heavy clay; strong 20-50mm lenticular; few medium 2-6mm calcareous nodules; moist, moderately weak; field pH 9; gradual to-
B22	1.20 to 1.70 m	Brownish grey (10YR5/1) moist; very few coarse prominent brown mottles; medium heavy clay; strong 10-20mm lenticular, strong 20-50mm lenticular; few medium 2-6mm calcareous nodules; moist, moderately weak; field pH 9.

Analytical data:

Depth	1:5 soil/water			Particle size				pH 8.5 Alcoholic Cations					BAR	D.R	Total Element					
		dS/m	%	%				meq%					%		%	%	%	%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	7.3	0.28	0.001	8	24	29	38	51.5	26.3	17.9	1.0	1.47	24	N/A	N/A	N/A	N/A	2	1.50	123
10-20	7.5	0.23	0.001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	24	N/A	N/A	N/A	N/A	N/A	N/A	N/A
20-30	7.7	0.26	0.001	11	22	30	37	50.5	22.1	21	1.8	0.76	22	N/A	N/A	N/A	N/A	4	1.10	123
30-40	7.9	0.29	0.002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	24	N/A	N/A	N/A	N/A	N/A	N/A	N/A
40-50	7.9	0.31	0.002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	24	N/A	N/A	N/A	N/A	N/A	N/A	N/A
50-60	8.1	0.35	0.003	7	19	31	43	54.1	21.2	25.5	3.5	0.81	24	N/A	N/A	N/A	N/A	7	0.80	119
60-70	8.3	0.43	0.004	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	25	N/A	N/A	N/A	N/A	N/A	N/A	N/A
70-80	8.4	0.50	0.006	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	25	N/A	N/A	N/A	N/A	N/A	N/A	N/A
80-90	8.6	0.63	0.009	9	18	31	42	52.6	18.9	26.3	4.9	1.03	24	N/A	N/A	N/A	N/A	9	0.72	122
90-100	8.7	0.61	0.013	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	25	N/A	N/A	N/A	N/A	N/A	N/A	N/A
100-110	8.6	0.63	0.017	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	27	N/A	N/A	N/A	N/A	N/A	N/A	N/A
110-120	8.7	0.62	0.026	9	18	30	43	50.9	17.0	26.5	5.3	1.27	27	N/A	N/A	N/A	N/A	10	0.64	116
120-130	8.7	0.60	0.030	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	29	N/A	N/A	N/A	N/A	N/A	N/A	N/A
130-140	8.6	0.69	0.034	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	28	N/A	N/A	N/A	N/A	N/A	N/A	N/A
140-150	8.6	0.63	0.041	5	16	31	45	55.6	17.1	28.9	5.6	1.28	28	N/A	N/A	N/A	N/A	10	0.59	117
150-160	8.6	0.64	0.042	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	28	N/A	N/A	N/A	N/A	N/A	N/A	N/A
160-170	8.7	0.69	0.045	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	28	N/A	N/A	N/A	N/A	N/A	N/A	N/A
170-180	8.7	0.69	0.047	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	28	N/A	N/A	N/A	N/A	N/A	N/A	N/A
180-190	8.6	0.69	0.045	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	28	N/A	N/A	N/A	N/A	N/A	N/A	N/A
190-200	8.7	0.68	0.043	5	15	14	65	53.5	26.7	33.1	5.1	1.07	27	N/A	N/A	N/A	N/A	10	0.81	102

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
		dS/m	%										
(cm)	pH	EC	Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
0-10	7.3	0.28	0.001	1.7	0.06	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10-20	7.5	0.23	0.001	1.0	0.05	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

NUDLEY

REPRESENTATIVE SOIL PROFILE

Location:	214850 mE 7060750 mN Zone 56	**Site No:**	MWD 30
Landform element:	Back plain	**Microrelief description:**	Absent
Landform pattern:	Alluvial plain	**Permeability:**	Slowly permeable
Slope:	0%	**Drainage:**	Poorly drained
Great Soil Group:	Brown Podzolic	**Substrate lithology:**	Alluvium
Principal Profile Form:	Dy2.43	**Surface coarse fragments:**	Absent
Australian Soil Classification:	Bleached-sodic, Eutrophic, Grey Chromosol	**Surface condition:**	Hardsetting
Disturbance:	Grazing		
Vegetation:	Open woodland. *Eucalyptus populnea*, *Callitris glaucophylla*, *Eremophila mitchellii*		

Profile Morphology:

Horizon	Depth	Description
A11	0 to 0.02 m	Dark greyish brown (10YR 4/2) moist; clay loam; moderate <2mm platy parting to 2-5mm granular; dry, weak; abrupt to-
A12	0.02 to 0.05 m	Dark greyish brown (10YR 4/2) moist; clay loam; moderate 10-20mm angular blocky; dry, firm; clear to-
A13	0.05 to 0.32 m	Dark greyish brown (10YR 4/2) moist; clay loam; weak 50-100mm angular blocky/prismatic; dry, strong; clear to-
A2e	0.32 to 0.45 m	Dark greyish brown (10YR 4/2) moist, light grey (10YR 7/2) dry; clay loam; massive; dry strong; clear to-
B21t	0.45 to 0.70 m	Very dark grey (10YR 5/1) moist; medium clay; moderate 20-50mm prismatic; dry, strong; gradual to-
B22t	0.70 to 1.50 m	Dark grey (10YR 4/1) moist; medium clay; weak 20-50mm angular blocky; rough ped fabric; dry, very strong.

Analytical Data:

Depth	1:5 soil/water			Particle size				pH 7.0 Aqueous Cations					BAR	D.R	Total Element					
		dS/m	%		%			meq%					%		(%)			%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	6.5	0.04	0.002	9	56	21	20	11.0	7.4	3.4	0.1	0.11	9	0.59	0.041	0.850	0.045	1	2.17	55
20-30	6.1	0.02	0.002	8	57	20	19	9.0	5.5	2.3	0.5	0.34	10	0.85	0.022	0.796	0.032	5	2.39	45
50-60	7.0	0.06	0.005	8	47	18	28	16.0	11.0	3.8	1.0	0.39	13	0.74	0.021	0.736	0.031	6	2.89	58
80-90	7.4	0.11	0.013	10	49	18	24	16.0	9.9	4.1	1.2	0.44	11	0.77	0.024	0.788	0.038	8	2.41	65
110-120	7.5	0.16	0.022	11	52	17	24	15.0	8.8	4.5	1.6	0.41	N/A	N/A	0.022	0.797	0.031	11	1.95	64
140-150	8.1	0.26	0.026	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
		dS/m	%										
(cm)	pH	EC	Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	6.9	0.05	0.002	1.6	0.11	N/A	30	0.93	26	24	0.2	0.6	N/A

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

NUNGIL

REPRESENTATIVE SOIL PROFILE

Location:	352800 mE 6991200 mN Zone 56	**Site No:**	MCD 8
Landform element:	Hillslope	**Microrelief description:**	Absent
Landform pattern:	Undulating rises	**Permeability:**	Highly permeable
Slope:	0-3%	**Drainage:**	Moderately well drained
Great Soil Group:	Euchrozem	**Substrate lithology:**	Basalt
Principal Profile Form:	Uf6.31	**Surface coarse fragments:**	Absent
Australian Soil Classification:	Haplic, Eutrophic, Brown Ferrosol	**Surface condition:**	Hardsetting
Disturbance:	Grazing		
Vegetation:	Woodland. *Eucalyptus populnea, Brachychiton populneus, Corymbia tessellaris, Cassinia spp., Bothriochloa bladhii, Bothriochloa decipiens, Cymbopogon refractus*		

Profile Morphology:

Horizon	Depth	Description
A1	0 to 0.20 m	Dark brown (7.5YR3/2) moist; fine sandy light clay; few large sub-angular basalt pebbles; weak 2-5mm polyhedral, weak 5-10mm polyhedral; dry, moderately weak; field pH 5.8; clear to-
B21t	0.20 to 0.40 m	Dark brown (7.5YR3/4) moist; medium clay; few large sub-angular basalt pebbles; moderate 2-5mm polyhedral parting to weak 5-10mm sub-angular blocky; dry, moderately weak; field pH 5.8; gradual to-
B22t	0.40 to 0.60 m	Dark yellowish brown (10YR4/6) moist; medium clay; few large sub-angular basalt pebbles; moderate 2-5mm polyhedral parting to weak 5-10mm polyhedral; dry, moderately firm; field pH 5.8; gradual to-
B3	0.60 to 1.00 m	Dark yellowish brown (10YR3/4) moist; medium clay; many large angular basalt pebbles; weak 5-10mm polyhedral; dry, moderately firm; field pH 7;
C	1.00 to 1.40 m	Dark grey (10YR4/1) moist.

Analytical data

Depth	1:5 soil/water			Particle size				pH 7.0 Aqueous Cations					BAR	D.R	Total Element					
		dS/m	%	%				meq%					%		%	%	%	%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	ECEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	6.7	0.04	0.002	9	28	19	44	19.0	12.9	4.3	0.1	1.78	15	0.24	0.180	1.050	0.029	<1	3.00	43
20-30	6.1	0.03	0.004	8	14	13	66	23.0	17.0	5.5	0.4	0.51	24	0.17	0.209	0.787	0.019	2	3.10	35
50-60	6.4	0.05	0.007	11	17	17	57	34.0	27.1	8.0	0.8	0.58	29	0.28	0.382	1.150	0.015	2	3.40	64
80-90	7.4	0.07	0.006	23	22	10	47	N/A	N/A	N/A	N/A	N/A	31	0.47	0.325	1.380	0.012	N/A	N/A	N/A

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
(cm)	pH	dS/m EC	% Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	6.7	0.04	0.001	2.4	0.19	249	95	1.40	61	50	1.4	0.9	6

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

OAKEY

REPRESENTATIVE SOIL PROFILE

Location:	378622 mE 6967576 mN Zone 56	**Site No:**	EDS 841
Landform element:	Alluvial plains	**Microrelief description:**	Absent
Landform pattern:	Alluvial plains	**Permeability:**	Moderately permeable
Slope:	0%	**Drainage:**	Imperfectly drained
Great Soil Group:	Red Brown Earth	**Substrate lithology:**	Mixed sandstone alluvium
Principal Profile Form:	Dr2.13	**Surface coarse fragments:**	Absent
Australian Soil Classification:	Eutrophic, Subnatric, Red Sodosol	**Surface condition:**	Hardsetting
Disturbance:	Grazing		
Vegetation:	Tall open forest. *Eucalyptus populnea*, *Aristida* spp.		

Profile Morphology:

Horizon	Depth	Description
A1	0. to 0.10	Brownish black (7.5YR3/2) moist; brown (7.5YR4/3D); fine sandy clay loam; dry, weak; field pH 6.0; clear to-
A3	0.10 to 0.30	Dark reddish brown (5YR3/4) moist; fine sandy clay loam; dry, firm; field pH 5.5; clear to-
B1t	0.30 to 0.40	Dark reddish brown (5YR3/4) moist; medium heavy clay; strong 20-50mm angular blocky; dry, strong; field pH 6.0; clear to-
B21t	0.40 to 0.70	Dark reddish brown (5YR3/4) moist; medium heavy clay; strong 50-100mm prismatic parting to strong 10-20mm angular blocky; dry, strong; field pH 8.5; gradual to-
B22t	0.70 to 1.00	Dark brown (7.5YR3/4) moist; medium heavy clay; strong 20-50mm angular blocky parting to strong 10-20mm angular blocky; few 2-6mm calcareous concretions, few medium 2-6mm soft calcareous segregations; dry, strong; field pH 8.5; gradual to-
B23t	1.00 to 1.50	Brown (7.5YR4/4) moist; medium clay; moderate 10-20mm angular blocky; few 2-6mm calcareous concretions; dry, strong; field pH 9.0.

Analytical data:

	1:5 soil/water			Particle size				pH 8.5 Alcoholic Cations					BAR	D.R	Total Element					
Depth		dS/m	%	%				meq%					%		%	%	%	%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	5.6	0.25	0.002	17	34	15	31	23.5	6.7	3.5	0.1	1.53	11	0.52	0.106	1.090	0.053	<1	1.90	38
20-30	4.8	0.17	0.001	12	27	11	49	23.7	4.7	4.2	0.4	0.81	14	0.43	0.064	0.948	0.028	2	1.10	21
50-60	8	0.47	0.038	8	21	15	60	32.5	10.0	13.6	4.6	0.37	21	0.78	0.047	0.962	0.026	14	0.70	48
80-90	8.8	0.89	0.076	10	22	18	53	32.3	9.5	12.5	5.3	0.41	19	0.70	0.046	1.090	0.031	16	0.80	52
110-120	8.7	0.86	0.082	5	26	18	53	30.4	10.5	14.7	5.5	0.47	N/A	N/A	0.071	1.170	0.020	18	0.70	59
140-150	8.6	0.64	0.059	4	33	21	46	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.079	1.250	0.023	N/A	N/A	N/A

	1:5 soil/water								DTPA extract.				
Depth		dS/m	%	%	%	P mg/kg		meq%	mg/kg				mg/kg
(cm)	pH	EC	Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	6.5	0.35	0.002	5.3	0.40	127	80	2.00	78	322	6.0	6.0	51

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

PURRAWUNDA

REPRESENTATIVE SOIL PROFILE

Location:	391503 mE 6958653 mN Zone 56	**Site No.**	EDS 559
Landform element:	Hillslope	**Microrelief description:**	Absent
Landform pattern:	Rolling rises	**Permeability:**	Slowly permeable
Slope:	12%	**Drainage:**	Moderately permeable
Great Soil Group:	Black Earth	**Substrate lithology:**	Basalt
Principal Profile Form:	Ug5.12	**Surface coarse fragments:**	Absent
Australian Soil Classification:	Haplic, Self-mulching, Black Vertosol	**Surface condition:**	Self-mulching
Disturbance:	Grazing		
Vegetation:	Native pasture. *Dichanthium sericeum*		

Profile Morphology:

Horizon	Depth	Description
A1	0 to 0.03	Dark (10YR 2/2); light medium clay; strong 2-5mm granular; dry, firm; field pH 7.0; abrupt to-
B1	0.03 to 0.15	Dark (10YR 2/1); medium heavy clay; strong 2-5mm sub-blocky; moderately moist, firm; clear to-
B21	0.15 to 0.70	Dark (10YR 3/1); medium heavy clay; strong 10-20mm parting to <2mm lenticular; moist, firm; very few 2-6mm soft calcareous segregations; field pH 8.5 to 8.8; clear to-
B22	0.70 to 0.80	Dark (10YR 2/2); medium heavy clay; strong 10-20mm parting to 2-5mm lenticular; moist, firm; very few 2-6mm soft calcareous segregations; field pH 9.0; clear to-
B3	0.80 to 1.00	Dark and brown (10YR 3/2 & 10YR 4/5); medium clay; weak 2-5mm angular blocky; moderately moist, firm; very few 2-6mm soft calcareous and few 2-6mm concretionary segregations; field pH 9.0; clear to-
BC	1.00 to 1.20	Brown (7.5YR 4/4); sandy light clay; dry, very firm; gradual boundary to strongly weathered basalt

Analytical data:

Depth	1:5 soil/water			Particle size				pH 8.5 Alcoholic Cations					BAR	D.R	Total Element					
		dS/m	%	%				meq%					%		%			%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	7.5	0.09	0.003	4	21	21	52	75.2	33.3	29.0	0.3	1.01	26	0.38	0.111	0.644	0.046	1	1.00	128
20-30	8.2	0.08	0.001	4	13	19	63	83.5	37.9	32.5	0.6	0.39	30	0.34	0.072	0.485	0.029	1	1.10	114
50-60	8.9	0.10	0.001	2	10	15	71	93.1	49.3	37.3	1.1	0.42	36	0.41	0.064	0.402	0.019	1	1.20	120

Depth	1:5 soil/water			%	%	mg/kg		meq%	DTPA extract. mg/kg				mg/kg
		dS/m	%										
(cm)	pH	EC	Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	7.4	0.10	0.004	3.0	0.25	241	70	1.00	50	49	3.0	2.0	11

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

RUTHVEN

REPRESENTATIVE SOIL PROFILE

Location: 397780 mE 6946200 mN Zone 56
Site No: B 170
Landform element: Hillslope
Microrelief description: Absent
Landform pattern: Undulating plains
Permeability: Highly permeable
Slope: Unknown
Drainage: Very well drained
Great Soil Group: Krasnozem
Substrate lithology: Undescribed basaltic material
Principal Profile Form: Gn3.11
Surface coarse fragments: Absent
Australian Soil Classification: Haplic, Eutrophic, Red Ferrosol
Surface condition: Soft
Disturbance: Unknown
Vegetation: Woodland. *Eucalyptus tereticornis*

Profile Morphology:

Horizon	Depth	Description
A1	0 to 0.12 m	Dark greyish brown (7.5YR3/2) dry; clay loam; moderate 2-5 mm blocky; clear to-
B1	0.12 to 0.22 m	Dark greyish brown (5YR3/3) dry; light clay; moderate 2-5 mm blocky; diffuse to-
B21t	0.22 to 0.97 m	Red (2.5YR4/8) dry; heavy clay; moderate 5-10 mm blocky; fragments of very weathered basalt.
B22t	0.97 to 2.00 m	Red (2.5YR4/8) moist; heavy clay; moderate 5-10 mm blocky; fragments of very weathered basalt.
B3	2.00 to 2.37 m	Red mottled with yellow-brown; heavy clay; weak 5-10 mm blocky; common basalt gravel.

Analytical data:

Depth	1:5 soil/water			Particle size %				pH 7.0 Aqueous Cations meq%					BAR %	D.R	Total Element %		%			
(cm)	pH	dS/m EC	% Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-12	6.2	0.04	0.005	2	15	18	46	32.9	18.0	13.7	0.5	0.68	N/A	N/A	0.080	N/A	N/A	2	1.30	136
12-22	6.3	0.03	0.002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
22-55	6.4	0.02	0.001	1	12	14	69	11.0	3.1	7.1	0.7	0.07	N/A	N/A	0.051	N/A	N/A	6	0.40	36
55-97	6.1	0.03	0.007	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
97-150	5.9	0.04	0.014	1	10	15	76	7.1	0.7	5.7	0.7	0.03	N/A	N/A	0.051	N/A	N/A	10	0.13	22
150-200	5.9	0.04	0.023	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
200-237	6.1	0.04	0.02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
(cm)	pH	DS/m EC	% Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
0-12	6.2	0.04	0.005	8.3	0.50	15							
12-22	6.3	0.03	0.002	3.9									
22-55	6.4	0.02	0.001	1.2	0.08	3							
55-97	6.1	0.03	0.007	0.5									
97-150	5.9	0.04	0.014	0.2	0.03								
150-200	5.9	0.04	0.023	0.2									
200-237	6.1	0.04	0.02	0.2									

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

SOUTHBROOK

REPRESENTATIVE SOIL PROFILE

Location:	374100 mE 6937800 mN Zone 56	**Site No:**	MCD 11
Landform element:	Hillslope	**Microrelief description:**	Absent
Landform pattern:	Rolling low hills	**Permeability:**	Highly permeable
Slope:	7%	**Drainage:**	Well drained
Great Soil Group:	Krasnozem	**Substrate lithology:**	Basalt
Principal Profile Form:	Uf6.31	**Surface coarse fragments:**	Few cobbles, angular basalt
Australian Soil Classification:	Haplic, Eutrophic, Brown Ferrosol	**Surface condition:**	Soft
Disturbance:	Grazing		
Vegetation:	Dry open forest. *Eucalyptus drepanophylla, Dodonea* spp. *Cassinia* spp. *Ligustium lucidum, Sida* spp. *Cymbopogon refractus*		

Profile Morphology:

Horizon	Depth	Description
A1	0 to 0.30 m	Dark reddish brown (5YR3/2) moist; light medium clay; common large 20-60mm pebbles, few medium 6-20mm pebbles, moderate 5-10mm granular; dry, moderately weak; field pH 5.5; clear to-
B21	0.30 to 0.0 m	Reddish brown (5YR4/4) moist; medium clay; moderate 10-20mm angular blocky; dry, moderately firm; field pH 5.5 to 6; gradual to-
B22	0.50 to 1.00 m	Brown (7.5YR4/4) moist; medium clay; strong 50-100mm lenticular, moderate 10-20mm sub-angular blocky; very few medium 2-6mm ferro-manganiferous nodules; dry, moderately firm; field pH 6 to 7.5; gradual to-
B3c	1.00 to 1.20 m	Yellowish red (5YR4/6) moist; light clay; weak 50-100mm sub-angular blocky; very few medium 2-6mm ferro-manganiferous nodules; dry, moderately weak; field pH 7.5.

Analytical data:

Depth	1:5 soil/water			Particle size				pH 7.0 Aqueous Cations					BAR	D.R	Total Element					
		dS/m	%	%				meq%					%		%	%	%	%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	ECEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
B0-10	6.5	0.10	0.002	N/A	N/A	N/A	N/A	27.6	16.0	10.0	0.2	1.40	N/A	N/A	N/A	N/A	N/A	1	1.60	N/A
0-10	6.6	0.13	0.002	18	15	23	42	40.8	24.2	14.7	0.3	1.68	31	0.38	0.221	1.060	0.080	1	1.60	97
20-30	7.1	0.08	0.003	N/A	N/A	N/A	N/A	36.6	18.0	17.0	1.3	0.31	N/A	N/A	N/A	N/A	N/A	4	1.10	N/A
50-60	7.4	0.32	0.035	3	22	21	54	56.2	26.7	26.7	2.6	0.26	33	0.49	0.141	0.674	0.011	5	1.00	104
80-90	7.8	0.27	0.029	3	20	17	61	53.2	25.6	24.6	2.7	0.28	33	0.46	0.121	0.657	0.010	5	1.04	87
110-120	7.7	0.28	0.034	8	54	21	15	66.5	33.1	29.9	3.3	0.14	N/A	N/A	0.270	1.09	0.006	5	1.11	443

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
(cm)	pH	dS/m EC	% Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	6.5	0.10	0.002	4.1	0.32	477	87	4.20	160	40	1.5	4.4	9

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

SOUTHBROOK

REPRESENTATIVE SOIL PROFILE

Location:	382963mE 6953094mN Zone 56	**Site No.**	EDS 844
Landform element:	Hillslope	**Microrelief description:**	Absent
Landform pattern:	Undulating rises	**Permeability:**	Moderately permeable
Slope:	6%	**Drainage:**	Well drained
Great Soil Group:	Euchrozem	**Substrate lithology:**	Basalt
Principal Profile Form:	Uf6.31	**Surface coarse fragments:**	Common, 60-200mm sub-angular basaltic fragments
Australian Soil Classification:	Haplic, Eutrophic, Red Ferrosol	**Surface condition:**	Firm
Disturbance:	Grazing		
Vegetation:	Open woodland. *Eucalyptus orgadophila*, *Brachychiton populneus*		

Profile Morphology:

Horizon	Depth	Description
A11	0 to 0.01 m	Dark reddish brown (5YR3/2) moist, dark reddish brown (5YR3/3) dry; light clay; strong <2mm granular; dry, moderately weak; field pH 7.0; sharp to-
A12	0.01 to 0.18 m	Dark reddish brown (5YR3/3) moist; light medium clay; strong 2-5mm sub-angular blocky, strong <2mm sub-angular blocky; moderately moist, weak; field pH 7.5; clear to-
B1	0.18 to 0.30 m	Dark reddish brown (2.5YR3/3) moist; medium clay; moderate 2-5mm angular blocky; moderately moist, firm; field pH 8.0; clear to-
B21	0.30 to 0.50 m	Dark reddish brown (2.5YR3/4) moist; medium clay; moderate 5-10mm angular blocky, moderate 2-5mm angular blocky; moderately moist, firm; field pH 8.0; clear to-
B22	0.50 to 0.85 m	Dark reddish brown (2.5YR3/5) moist; light clay; few small pebbles, sub-rounded basalt; strong 5-10mm parting to strong 2-5mm angular blocky; dry, very firm; field pH 8.5; gradual to-
B3	0.85 to 1.10 m	Dark reddish brown (2.5YR3/5) moist; medium clay; common 2-6mm and few 6-20mm sub-rounded basalt; strong 5-10mm parting to strong 2-5mm angular blocky; dry, very firm; field pH 8.5.

Analytical Data:

Depth	1:5 soil/water			Particle size				pH 8.5 Alcoholic Cations					BAR	D.R	Total Element					
		dS/m	%	%				meq%					%		%			%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	7.0	0.28	0.001	8	14	25	53	48.3	22.7	7.3	0.3	7.19	28	0.33	0.192	1.010	0.078	1	3.10	71
20-30	7.7	0.18	0.000	1	12	18	71	41.3	23.2	6.3	0.3	2.22	28	0.26	0.101	0.758	0.030	1	3.70	45
50-60	8.4	0.23	0.001	2	9	17	75	37.9	26.5	6.8	0.5	1.00	30	0.24	0.079	0.619	0.023	1	3.90	46
80-90	8.6	0.24	0.004	7	12	14	68	36.1	25.7	8.3	0.7	1.24	27	0.3	0.065	0.603	0.017	2	3.10	53

Depth	1:5 soil/water			%	%	mg/kg		meq%	DTPA extract. mg/kg				mg/kg
		dS/m	%										
(cm)	pH	EC	Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	7.0	0.34	0.001	6.2	0.52	217	158	5	55	187	18.0	4.0	59

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

TALGAI

REPRESENTATIVE SOIL PROFILE

Location:	355400 mE 6986300 mN Zone 56	**Site No:**	MCD 12
Landform element:	Hillslope	**Microrelief description:**	Normal gilgai; Horizontal interval: 3m
Landform pattern:	Undulating rises	**Microrelief component:**	Depression
Slope:	3%	**Permeability:**	Moderately permeable
Great Soil Group:	Grey clay	**Drainage:**	Imperfectly drained
Principal Profile Form:	Ug6.32	**Substrate lithology:**	Sandstone (argillaceous)
Australian Soil Classification: Vertic, Eutrophic, Grey Dermosol		**Surface coarse fragments:**	Very few large, sub-angular opalized wood pebbles
Disturbance:	Cultivation	**Surface condition:**	Weak crust, periodic cracking
Vegetation:	Woodland. *Acacia omalophylla, Geijera parviflora, Acacia harpophylla*, softwood scrub		

Profile Morphology:

Horizon	Depth	Description
A1c	0 to 0.05 m	Very dark grey (10YR3/1) moist; fine sandy light medium clay; very few, large 20-60mm rounded ironstone pebbles; weak 2-5mm granular; dry, very weak; field pH 8.5; clear to-
Apc	0.05 to 0.30 m	Very dark grey (10YR3/1) moist; fine sandy light medium clay; very few, medium 6-20mm rounded ironstone pebbles; moderate 5-10mm platy; dry, moderately firm; field pH 8.5 to 9; clear to-
B21	0.30 to 0.70 m	Very dark grey (10YR3/1) moist; fine sandy medium clay; few, medium 2-6mm calcareous soft segregations; dry, moderately firm; field pH 9; clear to-
B22	0.70 to 1.30 m	Yellowish brown (10YR5/4) moist; fine sandy medium heavy clay; few, coarse 6-20mm soft calcareous segregations; dry, very firm; field pH 9 to 8.5; clear to-
BC	1.30 to 1.90 m	Brown; many coarse distinct orange mottles; fine sandy medium clay; field pH 8.5 to 7.

Analytical data:

Depth	1:5 soil/water			Particle size %				pH 8.5 Alcoholic Cations meq%					BAR %	D.R	Total Element %			%		
(cm)	pH	dS/m EC	% Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
B0-10	8.3	0.13	0.002	N/A	N/A	N/A	N/A	25.0	24.0	4.8	0.3	0.88	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0-10	8.4	0.11	0.001	8	44	9	38	25.6	24.5	4.4	0.1	0.97	14	0.38	0.043	0.808	0.036	<1	5.60	79
0-10	8.4	0.13	0.001	8	45	9	38	23.5	23.5	4.2	0.1	1.12	14	0.31	0.041	0.788	0.036	<1	5.60	76
20-30	8.7	0.12	0.001	8	40	9	45	27.7	22.6	8.51	1.0	0.41	17	0.31	0.031	0.698	0.033	4	2.70	72
20-30	9.0	0.17	0.001	7	28	18	49	24.7	18.5	9.7	1.3	0.27	16	0.39	0.022	0.574	0.038	5	1.90	61
50-60	9.1	0.25	0.002	8	37	12	45	29.8	16.5	14.4	2.9	0.35	20	0.56	0.022	0.672	0.027	10	1.10	76
50-60	9.3	0.36	0.004	6	25	19	51	24.6	11.3	14.3	3.9	0.28	18	0.55	0.018	0.591	0.063	16	0.80	58
80-90	9.4	0.70	0.036	5	23	18	55	27.7	8.7	16.4	6.9	0.32	20	0.80	0.020	0.746	0.042	25	0.50	59
110-120	9.2	1.00	0.065	5	23	21	52	29.8	9.9	16.4	8.9	0.41	N/A	N/A	0.022	0.843	0.100	30	0.60	68

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
(cm)	pH	dS/m EC	% Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	8.3	0.13	0.002	1.6	0.14	22	7	2.20	7	6	0.8	0.3	3

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

TANDAWANNA

REPRESENTATIVE SOIL PROFILE

Location:	763400 mE 6971500 mN Zone 55	**Site No:**	MWD 31
Landform element:	Hillslope	**Microrelief description:**	Absent
Landform pattern:	Undulating rises	**Permeability:**	Slowly permeable
Slope:	4%	**Drainage:**	Poorly drained
Great Soil Group:	Red-brown earth	**Substrate lithology:**	Sandstone (argillaceous)
Principal Profile Form:	Dr2.31	**Surface coarse fragments:**	Absent
Australian Soil Classification:	Sodic, Eutrophic, Red Chromosol	**Surface condition:**	Hardsetting
Disturbance:	Cultivation		
Vegetation:	Cleared. Remnant *Casuarina cristata*, *Acacia harpophylla*		

Profile Morphology:

Horizon	Depth	Description
A1	0 to 0.17 m	Dark brown (7.5YR 3/2) moist; clay loam; massive; abrupt to-
A2j	0.17 to 0.18 m	Dark brown (7.5YR 3/2) moist; clay loam; massive; sporadically bleached; abrupt to-
B21t	0.18 to 0.45 m	Dark reddish brown (5YR 3/3) moist; heavy clay; strong 20-50 mm angular blocky; few 2-6mm manganese nodules; very few 6-20mm manganese nodules; dry, strong; clear to-
B22t	0.45 to 0.60 m	Brown (7.5YR 4/4) moist; medium heavy clay; strong 50-100 mm angular blocky; few 2-6mm manganese nodules; few 6-20mm soft calcareous segregations; dry, strong; clear to-
B23t	0.60 to 1.10 m	Reddish brown (5YR 4/4) moist; medium heavy clay; strong 50-100mm angular blocky; dry, strong; few 2-6 mm manganese nodules; gradual to-
B24t	1.10 to 1.50 m	Strong brown (7.5YR 5/8) moist; heavy clay; many faint grey mottle, coarse (7.5YR 7/2); few 2-6 mm manganese nodules, weak 50-100mm sub-angular blocky.

Analytical Data:

Depth	1:5 soil/water			Particle size				pH 8.5 Aqueous Cations					BAR	D.R	Total Element					
	dS/m		%	%				meq%					%		(%)			%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	7.1	0.09	0.001	9	51	15	31	22.0	13.0	3.2	0.3	1.10	11	0.37	0.054	0.378	0.049	1	4.06	57
20-30	8.1	0.07	0.002	5	39	13	45	28.0	13.0	9.6	0.2	0.25	17	0.56	0.028	0.320	0.034	<1	1.35	51
50-60	9.3	0.50	0.016	8	39	10	45	28.0	9.0	14.0	6.8	0.25	18	0.90	0.023	0.269	0.067	24	0.64	67
80-90	8.6	0.86	0.074	6	40	12	46	27.0	6.7	13.0	8.0	0.21	19	0.59	0.020	0.275	0.065	30	0.51	61
110-120	5.0	1.3	0.155	6	40	11	46	26.0	4.6	11.0	7.0	0.14	N/A	N/A	0.021	0.266	0.072	27	0.42	49
140-150	4.4	1.7	0.230	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
	dS/m		%										
(cm)	pH	EC	Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	6.9	0.08	0.001	1.3	0.11	N/A	24	1.10	19	65	1.6	1.1	N/A

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

TARA (gilgai mound)

REPRESENTATIVE SOIL PROFILE

Location:	242150 mE 7039150 mN Zone 56	**Site No:**	MWD 6
Landform element:	Plain	**Microrelief description:**	Melonhole gilgai Horizontal interval 10 m; Vertical interval 1 m
Landform pattern:	Plain	**Microrelief component:**	Depression
Slope:	0-1%	**Permeability:**	Very slowly permeable
Great Soil Group:	Grey clay	**Drainage:**	Poorly drained
Principal Profile Form:	Ug5.24	**Substrate lithology:**	Unidentified sedimentary clays
Australian Soil Classification:	Endohypersodic-Endoacidic, Pedal, Grey Vertosol	**Surface coarse fragments:**	Absent
Disturbance:	Grazing	**Surface condition:**	Periodic cracking
Vegetation:	Open forest. *Acacia harpophylla*, *Melaleuca lanceolata*, *Eremocitrus glauca*		

Profile Morphology:

Horizon	Depth	Description (mound)
A1	0 to 0.12 m	Very dark greyish brown (10YR 3/2), light medium clay; moderate 5-20mm sub-angular blocky; moderately moist, weak; clear to-
B21	0.12 to 0.50 m	Dark greyish brown (10YR 4/2), medium clay; strong 10-50mm prismatic; dry, strong; gradual to-
B22k	0.50 to 0.90 m	Greyish brown (10YR 5/2), medium clay; moderate 20-50mm prismatic; dry, firm; common 6-20mm soft calcareous segregations; gradual to-
B23	0.90 to 1.40 m	Greyish brown (10YR 5/2), medium clay; moderate 50-100mm prismatic; dry, strong.

Analytical Data: (gilgai mound)

Depth	1:5 soil/water			Particle size %				pH 8.5 Alcoholic Cations meq%					BAR %	D.R	Total Element (%)			%		
(cm)	pH	dS/m EC	% Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	6.5	0.14	0.002	11	34	13	44	22.0	12.0	4.3	0.6	1.4	14	0.44	0.039	0.334	0.055	3	3.02	42
20-30	8.4	0.44	0.047	7	26	12	55	25.0	15.0	7.2	2.7	0.44	19	0.57	0.021	0.249	0.035	11	2.08	46
50-60	8.4	1.30	0.169	6	26	11	55	24.0	11.0	9.6	5.6	0.29	20	0.89	0.015	0.235	0.048	23	1.14	48
80-90	6.0	1.40	0.185	6	26	11	54	24.0	7.3	8.2	5.9	0.30	19	0.98	0.015	0.236	0.047	25	0.89	40
110-120	4.9	1.40	0.171	9	29	8	50	22.0	5.1	6.8	5.3	0.33	N/A	N/A	0.014	0.235	0.048	24	0.75	35
140-150	4.6	1.30	0.179	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
(cm)	pH	dS/m EC	% Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	6.3	0.19	0.007	1.7	0.15	N/A	20	1.10	35	84	1.0	0.6	N/A

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available
Note: While the surface condition of this soil was pedal, the concept of Tara is surface crusting.

TARA (gilgai depression)

REPRESENTATIVE SOIL PROFILE

Location:	242155 mE 7039150 mN Zone 56	**Site No:**	MWD 7
Landform element:	Plain	**Microrelief description:**	Melonhole gilgai Horizontal interval 10 m; Vertical interval 1 m
Landform pattern:	Plain	**Microrelief component:**	Depression
Slope:	0-1%	**Permeability:**	Very slowly permeable
Great Soil Group:	Grey clay	**Drainage:**	Poorly drained
Principal Profile Form:	Ug5.24	**Substrate lithology:**	Unidentified sedimentary clays
Australian Soil Classification:	Endohypersodic-Endoacidic, Pedal, Grey Vertosol	**Surface coarse fragments:**	Absent
Disturbance:	Grazing	**Surface condition:**	Periodic cracking
Vegetation:	Open forest. *Acacia harpophylla*, *Melaleuca lanceolata*, *Eremocitrus glauca*		

Profile Morphology:

Horizon	Depth	Description (depression)
A1	0 to 0.05 m	Dark grey (10YR 4/1) moist; light clay; strong 10-20mm sub-angular blocky; dry, firm; clear to-
B21	0.05 to 0.20 m	Dark grey (10YR 4/1) moist; medium clay; strong 20-100mm prismatic to sub-angular blocky; dry, strong; clear to-
B22	0.20 to 0.90 m	Greyish brown (10YR 5/2) moist; heavy clay; strong 100-200mm prismatic; moderately moist, firm; clear to-
B23	0.90 to 1.50 m	Greyish brown (10YR 5/2) moist; 20% orange and red mottles; medium heavy clay; strong 100-200mm prismatic parting to moderate 50-100mm angular blocky; moderately moist, firm.

Analytical Data: (gilgai depression)

Depth	1:5 soil/water	dS/m	%	Particle size	%			pH 8.5 Alcoholic Cations	meq%				BAR %	D.R	Total Element (%)			%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	6.2	0.22	0.001	3	9	18	66	32.0	15.0	6.5	0.9	1.50	22	0.47	0.042	0.355	0.063	3	2.31	36
20-30	8.6	0.10	0.001	10	22	10	57	25.0	18.0	4.9	1.8	0.59	20	0.73	0.022	0.257	0.034	7	3.67	44
50-60	9.0	0.19	0.008	12	29	8	51	22.0	15.0	5.0	2.5	0.55	18	0.84	0.017	0.233	0.027	17	3.00	45
80-90	8.4	0.30	0.027	12	30	10	51	22.0	10.0	6.5	5.4	0.26	19	0.99	0.015	0.215	0.028	25	1.54	43
110-120	5.1	0.65	0.066	10	30	9	51	21.0	6.0	5.5	4.6	0.18	N/A	N/A	0.016	0.207	0.047	22	1.09	32
140-150	4.7	0.73	0.074	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Depth	1:5 soil/water	dS/m	%	%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
(cm)	pH	EC	Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	6.3	0.12	0.004	1.0	0.08	N/A	27	0.82	88	16	1.2	0.3	N/A

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

TOOLBURRA

REPRESENTATIVE SOIL PROFILE

Location:	315500 mE 7035500 mN Zone 56	**Site No:**	MCD 7
Landform element:	Hillslope (upper)	**Microrelief description:**	Absent
Landform pattern:	Undulating rises	**Permeability:**	Moderately permeable
Slope:	3-6%	**Drainage:**	Moderately well drained
Great Soil Group:	Red clay	**Substrate lithology:**	Sandstone
Principal Profile Form:	Uf6.31	**Surface coarse fragments:**	Absent
Australian Soil Classification:	Halpic, Eutrophic, Red Dermosol	**Surface condition:**	Soft
Disturbance:	Grazing		
Vegetation:	Open forest. *Bothriochloa bladhii, Cymbopogon refractus, Eucalyptus melanophloia*		

Profile Morphology:

Horizon	Depth	Description
A1	0 to 0.20 m	Dark reddish brown (5YR3/3) moist; light clay; moderate 5-10mm sub-angular blocky; dry, moderately firm; field pH 6; gradual to-
B21	0.20 to 0.60 m	Dark reddish brown (5YR3/4) moist; medium heavy clay; very few medium 6-20mm rounded ironstone pebbles; weak 20-50mm sub-angular blocky; very few <5mm manganiferous nodules; dry, moderately firm; field pH 6 to 6.5; gradual to-
B22	0.60 to 1.00 m	Dark reddish brown (5YR3/3) moist; medium heavy clay; very few medium 6-20mm pebbles, rounded ironstone; strong 20-50mm lenticular; very few <5mm manganiferous nodules; moderately moist, moderately firm; field pH 6.5 to 8.5; diffuse to-
B23	1.00 to 1.20 m	Dark reddish brown (5YR3/4) moist; medium clay; very few medium 6-20mm angular ironstone pebbles; moderate 20-50mm lenticular; few coarse 6-2mm soft calcareous segregations, very few <5mm manganiferous nodules; dry, very firm; field pH 8.5; clear to-
C	1.20 to 1.50 m	Dark reddish brown (5YR3/4) moist; field pH 7.5.

Analytical data:

Depth	1:5 soil/water			Particle size %				pH 8.5 Alcoholic Cations meq%					BAR %	D.R	Total Element %	%	%	%		
(cm)	pH	dS/m EC	% Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	6.8	0.05	0.001	8	24	17	51	30.8	16.4	6.8	0.2	0.56	20	0.24	0.088	0.222	0.038	1	2.40	47
20-30	7.1	0.02	0.001	11	30	10	51	23.5	13.3	5.8	0.2	0.14	17	0.24	0.049	0.148	0.024	1	2.30	38
30-40	8.4	0.07	0.001	7	20	7	68	33.0	20.6	12.4	0.7	0.16	25	0.34	0.024	0.134	0.014	2	1.67	50
50-60	8.8	0.18	0.002	14	21	11	55	25.7	17.5	11.3	0.8	0.13	21	0.39	0.022	0.125	0.013	3	1.55	54
80-90	9.0	0.18	0.002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
110-120	8.9	0.19	0.001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
(cm)	pH	dS/m EC	% Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	6.9	0.04	0.001	2.6	0.20	44	37	0.61	44	97	2.9	2.5	6

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

TOOWOOMBA

REPRESENTATIVE SOIL PROFILE

Location:	399050 mE 6949700 mN Zone 56	**Site No:**	B 213
Landform element:	Hillslope	**Microrelief description:**	Absent
Landform pattern:	Undulating plains	**Permeability:**	Highly permeable
Slope:	Unknown	**Drainage:**	Well drained
Great Soil Group:	Lateritic red earth	**Substrate lithology:**	Undescribed basaltic material
Principal Profile Form:	Gn3.11	**Surface coarse fragments:**	Absent
Australian Soil Classification:	Snuffy Red Ferrosol	**Surface condition:**	Soft
Disturbance:	Unknown		
Vegetation:	Unknown		

Profile Morphology:

Horizon	Depth	Description
A1	0 to 0.17 m	Dark reddish brown (5YR 3/3) dry; loam; strong <5mm granular grading to <5mm blocky with depth; “snuffy”; moist, weak; few 2-6mm ironstone nodules; clear to-
B1	0.17 to 0.37 m	Yellow-red (5YR5/6) moist; loam; strong <5mm granular grading to <5mm blocky with depth, “snuffy”; moist, weak; few 2-6mm ironstone nodules; diffuse to-
B21	0.37 to 0.60 m	Red-brown (2.5YR5/6) dry; clay loam; massive to weak blocky; moist, weak; abundant pisolitic lateritic gravel 6-20mm and small blocks of fragmentary laterite.
B22	0.60 to 1.10 m	Red-brown (2.5YR5/6) dry; light clay.
B23	1.10 to 1.50 m	Red-brown (2.5YR5/6) dry; medium clay
B24	1.50 to 2.00 m	Yellowish red (2.5YR5/8) dry; medium clay.

Analytical data:

Depth	1:5 soil/water			Particle size				pH 8.5 Alcoholic Cations					BAR	D.R	Total Element					
		dS/m	%	%				meq%					%		%	%	%	%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-17	6.1	0.03	0.011	13	18	25	19	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.139	N/A	N/A	N/A	N/A	N/A
17-37	6.5	0.01	0.008	22	20	32	17	13.1	7.8	4.9	<0.1	0.40	N/A	N/A	N/A	N/A	N/A	N/A	1.60	280
37-60	6.6	0.01	0.03	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
60-110	6.2	0.01	0.002	29	24	16	34	2.1	0.7	1.3	0.1	0.02	N/A	N/A	0.097	N/A	N/A	4	0.50	27
110-150	6.5	0.01	0.003	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
150-200	6.4	0.01	0.008	17	26	17	43	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
		dS/m	%										
(cm)	pH	EC	Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
0-17	6.1	0.03	0.011	12	0.64	26							
17-37	6.5	0.01	0.008	5	0.24								
60-110	6.2	0.01	0.002	0.25		10							
150-200	6.4	0.01	0.008	0.16									

Note: Total elements at 65 degrees Celsius; all other data reported at 105^{o}C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

WACO

REPRESENTATIVE SOIL PROFILE

Location:	349000 mE 6967000 mN Zone 56	**Site No.**	SPFD 86
Landform element:	Plain	**Microrelief description:**	Absent
Landform pattern:	Alluvial plain	**Permeability:**	Slowly permeable
Slope:	0.5%	**Drainage:**	Imperfectly drained
Great Soil Group:	Grey clay	**Substrate lithology:**	Alluvium
Principal Profile Form:	Ug5.24	**Surface coarse fragments:**	Absent
Australian Soil Classification:	Endohypersodic, Self-mulching, Black Vertosol	**Surface condition:**	Periodic cracking, self-mulching
Disturbance:	Cultivation		
Vegetation:	Unknown. Probably grassland. *Dichanthium sericeum*		

Profile Morphology:

Horizon	Depth	Description
Ap1	0 to 0.02 m	Brownish grey (10YR4/1) moist; medium clay; strong 50-100mm granular; very few medium 2-6mm calcareous nodules; dry, very firm; field pH 8; abrupt to-
Ap2v	0.02 to 0.20 m	Brownish grey (10YR4/1) moist; heavy clay; strong 50-100mm prismatic, moderate 20-50mm angular blocky; very few medium 2-6mm calcareous nodules; dry, very strong; field pH 9.5; clear to-
B21	0.20 to 0.60 m	Brownish grey (10YR4/1) moist; heavy clay; strong 20-50mm lenticular, strong 5-10mm lenticular; very few, coarse 2-6mm calcareous nodules, very few coarse 6-20 mm soft calcareous segregations; dry, very strong; field pH 9.5; gradual to-
B22	0.60 to 1.10 m	Brownish grey (10YR5/1) moist; medium heavy clay; strong 20-50mm lenticular, strong 10-20mm angular blocky; very few coarse calcareous nodules, very few, coarse 2-6mm soft calcareous segregations; moderately moist, moderately strong; field pH 9.5; diffuse to-
B23k	1.10 to 1.60 m	Greyish yellow-brown (10YR5/2) moist; few medium faint orange mottles; medium clay; common coarse 2-6mm soft calcareous segregations; moderately moist, very firm; field pH 9.5.

Analytical Data:

Depth	1:5 soil/water			Particle size %				pH 8.5 Alcoholic Cations meq%					BAR %	D.R	Total Element %			%		
(cm)	pH	dS/m EC	% Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	8.3	0.15	0.001	4	9	12	73	61.0	30.0	29.0	1.5	0.31	36	0.61	0.043	0.998	0.018	2	1.03	83
20-30	8.7	0.23	0.001	4	10	9	76	52.0	20.0	29.0	3.2	0.14	37	0.61	0.048	0.842	0.018	6	0.68	69
50-60	9.1	0.35	0.004	5	10	11	73	59.0	15.0	36.0	7.5	0.15	37	0.66	0.037	0.886	0.015	13	0.41	80
80-90	9.3	0.53	0.016	5	10	12	73	58.0	8.5	38.0	11.0	0.18	39	0.56	0.047	0.916	0.018	19	0.22	79
110-120	9.3	0.79	0.044	4	10	12	73	56.0	5.3	38.0	13.0	0.11	N/A	N/A	0.049	0.968	0.020	23	0.14	77
140-150	9.2	0.99	0.070	5	10	BQ	73	64.0	8.2	42.0	14.0	0.20	N/A	N/A	N/A	N/A	N/A	22	0.20	88

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
(cm)	pH	dS/m EC	% Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	8.3	N/A	N/A	1.4	0.06	N/A	33	2.00	26	11	1.6	1.0	6

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available
BQ – Below Quantifiable Level

WACO

REPRESENTATIVE SOIL PROFILE

Location: 324900 mE 7006300 mN Zone 56
Site No: WHE 4
Landform element: Plain
Microrelief description: Absent
Landform pattern: Alluvial plain
Permeability: Slowly permeable
Slope: 0.3%
Drainage: Imperfectly drained
Great Soil Group: Black earth
Substrate lithology: Alluvium
Principal Profile Form: Ug5.16
Surface coarse fragments: Absent
Australian Soil Classification: Endohypersodic, Self-mulching, Black Vertosol
Surface condition: Self-mulching, periodic cracking
Disturbance: Cultivation
Vegetation: Unknown. Probably grassland. *Dichanthium sericeum*

Profile Morphology:

Horizon	Depth	Description
Ap1	0 to 0.03 m	Brownish black (10YR3/1) moist; medium clay; strong 2-5mm granular; very few medium 2-6mm calcareous nodules; dry, moderately firm; field pH 8; abrupt to-
Ap2	0.03 to 0.25 m	Brownish black (10YR3/1) moist; medium clay; strong 20-50mm clod; few medium 2-6mm calcareous nodules; dry, very firm; field pH 9; clear to-
B21	0.25 to 0.70 m	Brownish black (10YR3/1) moist; medium heavy clay; strong 5-10mm lenticular parting to strong 2-5mm lenticular; few medium 2-6mm calcareous nodules; moist, moderately weak; field pH 9; diffuse to-
B22	0.70 to 1.10 m	Brownish grey (10YR4/1) moist; medium heavy clay; strong 5-10mm lenticular parting to strong 2-5mm lenticular,; few medium 2-6mm soft calcareous segregations; moist, moderately weak; field pH 9; diffuse to-
B23	1.10 to 1.40 m	Greyish brown (7.5YR4/2) moist; few coarse distinct grey mottles; medium heavy clay; few medium 2-6mm soft calcareous segregations; moist, moderately weak; field pH 9; diffuse to-
B24	1.40 to 1.80 m	Greyish brown (5YR4/2) moist; medium clay; moderate 2-5mm polyhedral; moist, moderately weak; field pH 9.

Analytical data:

Depth	1:5 soil/water			Particle size				pH 8.0 Alcoholic Cations					BAR	D.R	Total Element					
		dS/m	%	%				meq%					%		%	%	%	%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	ECEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
B0-10	8.3	0.14	0.001	2	8	14	73	76.2	44.2	27.3	2.5	3.26	N/A	N/A	0.020	0.060	0.020	3	1.60	106
0-10	8.1	0.27	0.007	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	35	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19-20	8.5	0.28	0.005	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	36	N/A	N/A	N/A	N/A	N/A	N/A	N/A
20-30	8.6	0.31	0.007	1	8	8	76	79.2	38.5	32.1	5.0	1.71	35	0.54	N/A	N/A	N/A	6	1.20	102
30-40	8.7	0.35	0.008	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	N/A
40-50	8.8	0.35	0.007	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	N/A
50-60	8.9	0.38	0.009	1	7	9	78	80.0	29.9	36.3	9.0	1.71	37	0.66	N/A	N/A	N/A	11	0.80	98
60-70	9.0	0.44	0.014	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	N/A
70-80	9.0	0.48	0.020	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	N/A
80-90	9.0	0.55	0.029	1	8	8	86	82.8	26.1	38.6	12.5	2.15	38	0.69	N/A	N/A	N/A	15	0.70	92
90-100	8.9	0.72	0.049	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
100-110	8.8	0.94	0.072	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
110-120	8.7	1.08	0.101	1	8	8	83	73.4	21.3	35.1	13.8	2.34	40	0.66	N/A	N/A	N/A	19	0.60	87
120-130	8.7	1.28	0.123	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
130-140	8.6	1.35	0.134	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
140-150	8.6	1.36	0.131	2	6	14	75	71.6	20.3	34.2	12.8	2.14	37	0.66	N/A	N/A	N/A	18	0.60	93
170-180	8.6	1.44	0.147	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	N/A
190-200	8.6	1.42	0.143	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	38	0.61	N/A	N/A	N/A	N/A	N/A	N/A

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
		dS/m	%										
(cm)	pH	EC	Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	8.30	0.14	0.001	1.2	0.05	799	42	2.33	24	10	1.4	0.6	N/A

WALKER

REPRESENTATIVE SOIL PROFILE

Location: 346000 mE 7029600 mN Zone 56
Site No: MCD 5
Landform element: Hillslope
Microrelief description: None
Landform pattern: Undulating rises
Permeability: Slowly permeable
Slope: 3-10%
Drainage: Imperfectly drained
Great Soil Group: No suitable group affinity to Solodic
Substrate lithology: Sandstone
Principal Profile Form: Dy3.12
Surface coarse fragments: Very few boulders, rounded Sandstone
Australian Soil Classification: Eutrophic, Subnatric, Grey Sodosol
Surface condition: Hardsetting
Disturbance: Cultivation
Vegetation: Forest. *Acacia harpophylla*

Profile Morphology:

Horizon	Depth	Description
A1	0. to 0.3 m	Very dark greyish brown (10YR3/2) moist; clay loam; very few large pebbles, angular sandstone; weak 2-5mm polyhedral; dry, moderately weak; field pH 5; clear to-
B21t	0.30 to 0.60 m	Brown (7.5YR4/2) moist; common medium faint yellow mottles; fine sandy medium clay; moderate 20-50mm sub-angular blocky parting to moderate 5-10mm sub-angular blocky; dry, very firm; field pH 5; gradual to-
B3	0.60 to 0.90 m	Brownish yellow (10YR6/6) moist; common coarse faint brown mottles; fine sandy medium clay; moderate 20-50mm sub-angular blocky; dry, very firm; field pH 5 to 6.5; gradual to-
BC	0.90 to 1.30 m	Brownish yellow (10YR6/6) moist, brown (7.5YR4/3) moist; clay loam; sandy; weak 20-50mm polyhedral; dry, very firm; field pH 6.5 to 7.

Analytical data:

Depth	1:5 soil/water			Particle size				pH 7.0 Aqueous Cations					BAR	D.R	Total Element					
		dS/m	%	%				meq%					%		%	%	%	%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	ECEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	6.1	0.18	0.016	9	60	6	28	11.1	6.7	3.0	0.9	0.69	7	0.28	0.072	1.190	0.042	8	2.20	40
30-40	5.5	0.15	0.015	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
50-60	5.6	0.21	0.023	6	54	8	35	13.2	3.4	7.7	1.4	0.43	10	0.59	0.032	1.420	0.022	11	0.40	37
70-80	6.3	0.12	0.006	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
110-120	8.1	1.00	0.183	8	51	12	32	20.2	2.6	11.1	5.8	0.33	N/A	N/A	0.035	1.930	0.026	29	0.24	62

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
		dS/m	%										
(cm)	pH	EC	Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	6.7	0.08	0.003	2.5	0.26	34	14	2.00	81	13	0.5	4.6	8

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

WALKER

REPRESENTATIVE SOIL PROFILE

Location:	363000 mE 6999500 mN Zone 56	**Site No.**	SPFD 85
Landform element:	Hillslope	**Microrelief description:**	Absent
Landform pattern:	Undulating low hill	**Permeability:**	Moderately permeable
Slope:	3-5%	**Drainage:**	Imperfectly drained
Great Soil Group:	No suitable group affinity to Solodic	**Substrate lithology:**	Sandstone
Principal Profile Form:	Dy2.13	**Surface coarse fragments:**	Very few boulders, rounded sandstone
Australian Soil Classification:	Sodic, Eutrophic, Grey Chromosol	**Surface condition:**	Hardsetting
Disturbance:	Grazing		
Vegetation:	Woodland. *Acacia harpophylla*, *Eucalyptus populnea*, *E. tessellaris*; *Geijera parviflora*		

Profile Morphology:

Horizon	Depth	Description
A1	0 to 0.05 m	Greyish yellow-brown (10YR4/2) moist; sandy clay loam; field pH 6; sharp to-
B21t	0.05 to 0.40 m	Greyish yellow-brown (10YR4/2) moist; few coarse faint dark mottles; medium heavy clay; few 60-20mm sub-angular sandstone cobbles; strong 20-50mm angular blocky; dry, moderately strong; field pH 8; clear to-
B22t	0.40 to 0.65 m	Dull yellowish brown (10YR5/4) moist; few medium faint orange mottles; medium heavy clay; few sub-angular sandstone boulders; moderate 10-20mm angular blocky; very few medium 2-6mm calcareous nodules; dry, very strong; field pH 9; gradual to-
B3k	0.65 to 0.80 m	Bright yellowish brown (10YR6/6) moist; light medium clay; common coarse 6-20mm calcareous nodules, few coarse 6-20mm soft calcareous segregations; field pH 9.5.

Analytical data:

Depth	1:5 soil/water			Particle size				pH 8.5 Alcoholic Cations					BAR	D.R	Total Element					
		dS/m	%	%				meq%					%		%	%	%	%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	6.6	0.05	0.001	30	37	8	26	9.0	5.3	2.6	0.2	0.89	9	0.39	0.046	0.795	0.030	2	2.02	35
20-30	7.9	0.06	0.001	22	24	5	49	20.0	11.0	8.1	0.8	0.21	15	0.50	0.026	0.790	0.017	4	1.36	41
50-60	8.9	0.22	0.003	21	27	8	45	20.0	8.4	9.4	1.8	0.17	14	0.58	0.023	0.860	0.022	9	0.89	44
80-90	9.2	0.39	0.021	12	39	9	39	19.0	6.2	9.6	3.0	0.20	13	0.74	0.023	1.070	0.055	16	0.65	49

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
		dS/m	%										
(cm)	pH	EC	Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	7.6	N/A	N/A	2.2	0.17	N/A	16	0.80	46	9	0.9	1.4	7

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

WERANGA

REPRESENTATIVE SOIL PROFILE

Location:	269100 mE 7011700 mN Zone 56	**Site No:**	MWD 532
Landform element:	Plain	**Microrelief description:**	Absent
Landform pattern:	Level plain	**Permeability:**	Very slowly permeable
Slope:	<1%	**Drainage:**	Poorly drained
Great Soil Group:	Soloth	**Substrate lithology:**	Sandstone
Principal Profile Form:	Db2.42	**Surface coarse fragments:**	Absent
Australian Soil Classification:	Magnesic, Mottled-Hypernatric, Brown Sodosol	**Surface condition:**	Hardsetting
Disturbance:	Grazing		
Vegetation:	Open forest. *Allocasuarina luehmannii*, *Eucalyptus crebra*, *E. populnea*, *E. microcarpa*, *Callitris glaucophylla*		

Profile Morphology:

Horizon	Depth	Description
A1	0 to 0.05 m	Brown (7.5YR 4/2) moist; sandy loam; massive; abrupt to-
A2e	0.05 to 0.06 m	Brown (10YR 5/3) moist, light grey (10YR 7/2) dry; massive; abrupt to-
B21t	0.06 to 0.40 m	Yellowish brown (10YR 5/4) moist; faint yellow-grey mottles; coarse sandy light medium clay; strong >100mm columnar; gradual to-
B22t	0.40 m +	Pale brown (10YR 6/3) moist; faint orange mottles; coarse sandy light medium clay; massive.

Analytical Data:

Depth	1:5 soil/water			Particle size %				pH 7.0 Aqueous Cations meq%					BAR %	D.R	Total Element (%)			%		
(cm)	pH	dS/m EC	% Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
0-10	6.5	0.01	0.001	38	41	9	15	5.0	1.6	3.1	0.3	0.24	5	0.47	0.029	0.103	0.035	5	0.51	35
20-30	6.4	0.25	0.021	34	34	10	24	11.0	0.5	6.7	3.3	0.09	10	0.57	0.014	0.095	0.045	30	0.07	44
50-60	7.2	0.72	0.093	26	36	13	30	18.0	0.2	10.0	7.8	0.12	13	0.87	0.013	0.127	0.038	43	0.02	60
80-90	7.2	0.66	0.090	28	38	7	27	16.0	0.1	9.0	6.8	0.12	12	0.98	0.011	0.123	0.032	43	0.01	59
110-120	7.1	0.55	0.076	34	38	5	21	12.0	0.1	6.8	5.3	0.11	N/A	N/A	0.011	0.117	0.031	44	0.01	59

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
(cm)	pH	dS/m EC	% Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	6.3	0.03	0.002	1.1	0.06	N/A	8.0	0.25	35	15	0.20	0.40	N/A

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

WYNHARI

REPRESENTATIVE SOIL PROFILE

Location:	218900 mE 6878300 mN Zone 56	**Site No:**	WLM 14
Landform element:	Crest	**Microrelief description:**	Gilgai
Landform pattern:	Gently undulating rises	**Microrelief component:**	Shelf
Slope:	0.5%	**Permeability:**	Slowly permeable
Great Soil Group:	Brown clay	**Drainage:**	Poorly drained
Principal Profile Form:	Ug5.32	**Substrate lithology:**	Labile sedimentary rocks
Australian Soil Classification:	Epiphypersodic–Endocalcareous, Epipedal, Brown Vertosol	**Surface coarse fragments:**	Absent
Disturbance:	Grazing	**Surface condition:**	Periodic cracking; firm to hardsetting
Vegetation:	Tall open forest. *Casuarina cristata* with occasional *Acacia harpophylla* and an understorey of shrubs		

Profile Morphology:

Horizon	Depth	Description
A1	0 to 0.05 m	Dark brown (10YR3/3) moist; light medium clay; moderate 10-20mm angular blocky, parting to moderate <2mm granular; moderately moist, moderately firm; abrupt to-
B21t	0.05 to 0.36 m	Dark brown (10YR3/3) moist; medium heavy clay; strong 20-50mm angular blocky, parting to moderate 10-20mm angular blocky; moist, moderately firm; few, medium 2-6mm carbonate nodules; clear to-
B22tk	0.36 to 0.98 m	Dull yellowish brown (10YR5/3) moist; few medium faint grey mottles; medium heavy clay; strong 200-500mm lenticular, parting to moderate 20-50mm angular blocky; moderately moist, very firm; many, coarse 6-20mm soft carbonate segregations, common medium 2-6mm carbonate nodules; gradual to-
BC	0.98 to 1.23 m	Soft weathered sandstone and siltstone; 'ghost rock' structure evident; very few, coarse 6-20mm soft carbonate segregations; gradual to-
C	1.23 m +	Weathered sandstone and siltstone; underlain by hard rock at depth (2-6m).

Analytical Data:

Depth	1:5 soil/water			Particle size %				pH 7.0 Aqueous Cations meq%					BAR %	D.R	Total Element (%)			%		
(cm)	pH	dS/m EC	% Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15*	R1	P	K	S	ESP	Ca/Mg	B.S
10	8.4	0.13	0.001	9	40	16	37	40.0	30.0	4.4	0.5	1.10	15	0.39	0.029	0.420	0.030	1	6.81	97
30	9.2	0.41	0.014	6	35	14	47	43.0	26.0	8.8	7.3	0.54	21	0.79	0.015	0.337	0.043	17	2.95	91
60	8.8	0.82	0.055	7	33	15	45	44.0	24.0	9.8	9.0	0.48	20	0.74	0.013	0.331	0.062	21	2.44	96
90	8.7	1.00	0.079	3	28	14	52	49.0	25.0	10.0	10.0	0.50	23	0.93	0.009	0.386	0.049	20	2.50	88

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
(cm)	pH	dS/m EC	% Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	8.2	0.16	0.002	1.2	0.11	15	9	0.86	17	23	0.8	0.4	N/A

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available

Note: Microrelief component - shelves (70% of area); firm to hardsetting; mounds and depressions (30% of area); weakly to moderately self mulching with a weak surface flake after rain

YARGULLEN

REPRESENTATIVE SOIL PROFILE

Location:	334700 mE 6901000 mN Zone 56	**Site No:**	MCD 10
Landform element:	Backplain	**Microrelief description:**	Absent
Landform pattern:	Alluvial plain	**Permeability:**	Slowly permeable
Slope:	1-3%	**Drainage:**	Imperfectly drained
Great Soil Group:	No suitable group affinity to Rendzina	**Substrate lithology:**	Alluvium
Principal Profile Form:	Ug5.11	**Surface coarse fragments:**	Absent
Australian Soil Classification:	Endocalcareous, Self-mulching, Black Vertosol	**Surface condition:**	Self-mulching, cracking
Disturbance:	Cultivation		
Vegetation:	Unknown		

Profile Morphology:

Horizon	Depth	Description
A1	0 to 0.10 m	Black (10YR2/1) moist; light medium clay; moderate 2-5mm granular; dry, moderately weak; field pH 7; gradual to-
B21k	0.10 to 0.40 m	Black (10YR2/1) moist; medium heavy clay; weak 10-20mm lenticular, strong 5-10mm sub-angular blocky; slickensides; very few, coarse 6-20mm soft calcareous segregations; dry, moderately firm; field pH 7 to 8.5; clear to-
B22k	0.40 to 1.00 m	Pale brown (10YR6/3) moist; dark greyish brown (10YR4/2) moist; medium clay; moderate 10-20mm sub-angular blocky; very many, extremely coarse >60mm soft calcareous segregations, few medium 2-6mm calcareous nodules; dry, very weak; field pH 8.5 to 9.5.

Analytical data:

Depth	1:5 soil/water			Particle size				pH 8.5 Alcoholic Cations					BAR	D.R	Total Element					
		dS/m	%	%				meq%					%		%	%	%	%		
(cm)	pH	EC	Cl	CS	FS	SI	CL	CEC	Ca	Mg	Na	K	15	R1	P	K	S	ESP	Ca/Mg	B.S
B0-10	7.7	0.22	0.003	N/A	N/A	N/A	N/A	51.0	30.0	18.0	0.5	3.10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0-10	7.7	0.11	0.002	3	13	26	57	57.1	41.2	19.0	0.6	3.28	33	0.31	0.095	1.670	0.041	1	2.20	113
10-20	8.2	0.12	0.001	N/A	N/A	N/A	N/A	56.0	32.0	19.0	2.1	1.20	N/A	N/A	N/A	N/A	N/A	4	1.70	N/A
20-30	8.5	0.16	0.005	1	8	17	73	60.0	33.8	22.9	3.4	1.31	45	0.69	0.082	1.610	0.022	6	1.50	84
30-40	8.5	0.51	0.049	N/A	N/A	N/A	N/A	43.0	20.0	20.0	2.6	0.94	N/A	N/A	N/A	N/A	N/A	6	1.00	N/A
50-60	8.4	1.40	0.218	13	14	13	63	28.3	11.5	17.8	1.5	0.68	28	0.5	0.083	0.965	0.013	5	0.65	50
70-80	8.3	2.00	0.329	N/A	N/A	N/A	N/A	25.0	8.4	17.0	1.1	0.62	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Depth	1:5 soil/water			%	%	P mg/kg		meq%	DTPA extract. mg/kg				mg/kg
		dS/m	%										
(cm)	pH	EC	Cl	Organic C	Total N	Acid	Bic	K	Fe	Mn	Cu	Zn	SO4-S
B0-10	7.7	0.22	0.003	3.0	0.25	339	42	6.6	14	11	1.0	0.6	8

Note: Total elements at 65 degrees Celsius; all other data reported at 105°C
* -1500kPa (-15 bar) using pressure plate apparatus
B-refers to the bulking of a number of surface samples prior to analysis
D.R. – Dispersion Ratio
B.S. – Base Status reported in cmol (+) kg^{-1} clay
N/A – Not Available
Note: This soil may frequently be classified as a Epibasic, Pedal, Hypercalcic Calcarosol.

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Appendix: Common names of plant species described in Representative profiles

Trees

Scientific name	Common name
Acacia excelsa	Ironwood
Acacia harpophylla	Brigalow
Acacia leiocalyx	Black wattle
Acacia omalophylla	Yarran
Acacia pendula	Myall
Acacia salicina	Sally wattle
Acacia shirleyi	Lancewood
Allocasuarina luehmannii	Bull oak
Angophora floribunda	Rough-barked apple
Angophora leicocarpa	Rusty gum
Banksia integrifolia	Coastal banksia
Brachychiton populneus	Kurrajong
Brachychiton rupestris	Bottle tree, Narrow-leaved bottle tree
Callitris glaucophylla (C. columellaris)	Cypress pine, White cypress pine
Cassinia laevis	Coughbush
Casuarina cristata	Belah
Corymbia tessellaris	Moreton Bay ash, Carbeen
Dodonea spp.	Hop bushes
Eremocitrus glauca	Limebush
Eremophila mitchellii	False sandalwood
Eucalyptus conica	Fuzzy box
Eucalyptus coolabah (E. microtheca)	Coolibah
Eucalyptus crebra	Narrow-leaved ironbark
Eucalyptus dealbata	Tumbledown red gum
Eucalyptus drepanophylla	Grey ironbark
Eucalyptus fibrosa subsp. *fibrosa*	Broad-leaved ironbark Broad-leaved red ironbark
Eucalyptus fibrosa subsp. *nubila*	Blue-leaved ironbark
Eucalyptus grandis	Flooded Gum; Rose Gum
Eucalyptus intermedia	Pink bloodwood
Eucalyptus melanophloia	Silver-leaved ironbark
Eucalyptus melliodora	Yellow box
Eucalyptus microcarpa	Gum-topped box
Eucalyptus moluccana	Gum topped box, Grey box
Eucalyptus orgadophila	Mountain coolibah
Eucalyptus populnea	Poplar box
Eucalyptus tereticornis	Queensland blue gum
Flindersia collina	Broad-leaved leopard tree
Geijera parviflora	Wilga
Grevillea striata	Beefwood
Ligustrum lucidum	Privet
Melaleuca bracteata	Black teatree
Melaleuca lanceolata	Western teatree
Petalostigma pubescens	Quinine bush
Santalum lanceolatum	Sandalwood
Xanthorrhoea spp.	Blackboy, Grass trees

Grasses and Herbs

Scientific name	Common name
Aristida spp.	Wiregrasses
Bothriochloa bladhii	Forest bluegrass
Bothriochloa decipiens	Pitted bluegrass
Cymbopogon refractus	Barbwire grass
Cynodon spp.	Couch
Dichanthium sericeum	Queensland bluegrass, Slender bluegrass
Marsilea hirsuta	Nardoo
Sida spp.	Sida
Urochloa spp.	Urochloa

GLOSSARY

A horizon	See *Soil horizon.*
A2 horizon	See *Subsurface soil; Bleach.*
Acid soil	A soil giving an acid reaction throughout most of all of the soil profile (precisely, below a pH of 7.0; practically, below a pH of 6.5). Generally speaking, when the pH drops below 5.5 the following specific problems may occur – aluminium toxicity, manganese toxicity, calcium deficiency and/or molybdenum deficiency. Such problems adversely affect plant growth and root nodulation, which may result in a decline in plant cover and increase in erosion hazard. *See pH.*
Adamellite	A variety of granite containing a calcium-bearing plagioclase, and a potassium feldspar, in roughly equal amounts.
Alkaline soil	A soil giving an alkaline reaction throughout most or all of the soil profile (precisely, above a pH of 7.0; practically, above a pH of 8.0). Many alkaline soils have a high pH indicated by the presence of calcium carbonate, and are suitable for agriculture. However, others are problem soil because of salinity and/or sodicity. Soils with a pH above 9.5 are generally unsuitable for agriculture. *See pH*.
Alluvial plain	A plain formed by the accumulation of alluvium on a floodplain over a considerable period of time; this accumulation may be still occurring at present (recent alluvium) or may have ceased (relict alluvium).
Alluvium (plural. alluvia)	Deposits of gravel, sand, silt, clay or other debris, moved by streams from higher to lower ground.
Arenic	Soils in which at least the upper 0.5 m of the profile is non-gravelly and of sandy texture throughout. It is also loosely or weakly coherent (see *Consistence*), and may have aeolian (wind-blown) cross-bedding. This term is used in the Australian Soil Classification (Isbell, 1996) to describe Tenosols (see *Tenosol*). Hence Arenaceous.
B horizon	*see Soil horizon*
Backplain	Large alluvial flat occurring some distance from the stream channel; often characterised by a high watertable and the presence of swamps or lakes.
Base status	This refers to the sum of exchangeable basic cations (Ca, Mg, K and Na) expressed in cmol (+) kg^{-1} clay. It is used as an indicator of soil fertility and is calculated by multiplying the sum of the reported basic cations by 100 and dividing by the clay percentage of the sample. Three classes are defined: dystrophic – the sum is less than 5; mesotrophic – the sum is between 5 and 15 inclusive; and eutrophic – the sum is greater than 15. it is used for some great group or subgroup distinctions within the Australian Soil Classification (Isbell, 1996).

Bleached-Leptic Soils with a conspicuously bleached A2 horizon which directly overlies a hard, continuous, discontinuous or broken layer of calcrete which may be massive, concretionary or nodular; or hard unweathered or decomposed rock or saprolite; or unconsolidated mineral materials. The term is used as a definition for a Tensile Sub-order in the Australian Soil Classification (Isbell, 1996).

Buffering capacity Ability of a soil to resist change (usually chemical). It is affected by factors such as clay content, clay type, organic matter levels and pH.

C horizon Layer(s) below the B horizon which may be weathered parent material, not bedrock, little affected by soil-forming processes.

Calcic These soils have a layer containing 2–20% soft carbonate and <20% hard carbonate. This term is used to describe a number of Soil Orders in the Australian Soil Classification (Isbell, 1996).

Calcrete A layer of cemented carbonate accumulation. The material must be hard.

Cation A positively charged ion.

Cation exchange capacity (CEC) The measure of the capacity of a soil to hold the major cations: calcium, magnesium, sodium and potassium (including hydrogen, aluminium and manganese in acid soils). It is a measure of the potential nutrient reserves in the soil and it therefore an indicator of inherent soil fertility. An imbalance in the ration of cations can result in soil structural problems. High levels of individual cations (e.g. aluminium and manganese) can also be toxic to plants.

Chromosol A Soil Order of the Australian Soil Classification (Isbell, 1996). Soils have a clear or abrupt textural B horizon where the pH is 5.5 (water) or greater in the upper 0.2m of the B2 horizon.

Clays Soils with a uniform clay texture throughout the surface soil and subsoil.
cracking — clay soils that develop vertical cracks when dry.
non-cracking — clay soils that do not develop vertical cracks when dry.

Colluvium (pl. colluvia) Slope deposits of soil and rock material.

Concretion See *Segregation.*

***Consistence* (of soil)** Refers to the degree of resistance to breaking or deformation when a force is applied.

Cracking clays See *Clays, cracking.*

Crusting See *Surface crust.*

Crusty Soils with a massive or weakly structured surface crusty horizon 0.03 m or less thick, often of lighter texture than the underlying pedal clay which is not self-mulching. It is used as a Subgroup definition for Vertosols in the Australian Soil Classification (Isbell, 1996).

Deep weathering The process by which earthy or rocky materials are slowly broken down into finer particles and soil by chemical processes over a long period of time. The chemical alteration of the rocks involved:

- leaching of the calcium-rich cement which previously bound the constituent practices together to form the rocks;
- a progressive transformation of feldspar minerals, clay minerals and labile fragments to form a new matrix of kaolinite white clay;
- the alteration of iron-rich minerals to form iron oxides (red colour); and
- mobilising and recrystallising of silica produced from the breakdown of minerals; more resistant quartz grains were relatively unaffected.

See *Laterite.*

Dermosol A Soil Order of the Australian Soil Classification (Isbell, 1996). Soils with structured B2 horizons and lacking strong texture contrast between A and B horizons.

Dispersion The process whereby soils break down and separate into their constituent particles (clay, silt, sand) in water. Dispersible soils tend to be highly erodible and present problems for earth works. Dispersion is associated with sodicity levels. See *Sodicity.*

Dissection The process of streams or erosion cutting the land into hill, ridges and flat areas.

Drainage (soil profile) The rate of downward movement of water through the soil, governed by both soil and site characteristics. Categories are as follows:

- very poorly drained: free water remains at or near the surface for most of the year.
- poorly drained: all soil horizons remain wet for several months each year.
- imperfectly drained: some soil horizons remain wet for periods of several weeks.
- moderately well drained: some soil horizons remain wet for a week after water addition.
- well drained: no horizon remains wet for more than a few hours after water addition.
- rapidly drained: no horizon remains wet except shortly after water addition.

Duplex soil See *Texture contrast soil.*

Duricrust A cemented layer at or near the surface resulting from the concentration of breakdown products of rock weathering.

Dystrophic See *Base status.*

Earths Soils with a sandy to loamy (including clay loam) surface soil, gradually increasing to a loamy to light clay subsoil.

massive — earths in which the subsoil is not arranged into natural soil aggregates and appears as a coherent, or solid mass.

structured — earths in which the subsoil is arranged into natural soil aggregates which can be clearly seen.

Electrical conductivity (EC) A measure of the conduction of electricity through water, or a water extract of soil. The value can reflect the amount of soluble salts in an extract and therefore provide an indication of soil salinity.

Endohypersodic Soils in which an ESP of 15 or greater occurs in some subhorizon below 0.5 m. It is used as a Subgroup definition for Vertosols in the Australian Soil Classification (Isbell, 1996).

Epicalcareous A soil in which the major part of the top 0.5 m of the profile is calcareous. It is used to describe Vertosols in the Australian Soil Classification (Isbell, 1996).

Epipedal Soils with a pedal A horizon which is either not or weakly self-mulching, and there is no surface crusty horizon. It is used as a Subgroup definition for Vertosols in the Australian Soil Classification (Isbell, 1996).

Epihypersodic Soils with at least one sub-horizon within the top 0.5 m of the profile having an ESP greater than 15. It is used as a Subgroup definition for Vertosols in the Australian Soil Classification (Isbell, 1996).

ESP Exchangeable sodium percentage. See *Sodicity.*

Eutrophic See *Base Status.*

Eutrophication Process by which water becomes enriched with nutrients, primarily nitrogen and phosphorus, which stimulate the growth of aquatic flora and/or fauna.

Feldspar Any of a group of alkaline aluminium silicate minerals, an important part of igneous rocks, such as granite.

Ferrosol A Soil Order of the Australian Soil Classification (Isbell, 1996). Soils with B horizons which are high in free oxide, and which lack strong texture contrast between A and B horizons.

Floating sandstone Loose sandstone rock fragments that are often found in the soil on a slope.

Floodplain Alluvial plains formed by flooding streams or rivers and prone to inundation from flooding.

Gilgai Surface microrelief associated with soils containing shrink-swell clays. Characterised by the presence of mounds and depressions.

crabhole — irregularly distributed small depressions and mounds, separated by a more or less continuous shelf. Vertical interval usually less than 0.3 m. Horizontal interval usually 3-20 m, surface almost level.

linear — long, narrow, parallel, elongate mounds and broader, elongate depressions more or less at right angles to the contour; usually in sloping lands.

melonhole — large depressions, usually greater than 3 m diameter and deeper than 0.3 m, which have a sub-circular or irregular shape and are separated by elongate mounds or set in an almost level surface.

normal — small, irregularly distributed mounds and sub-circular depressions, usually with less than 0.3 m vertical interval between the mound tops and bottom of depressions.

Gradational The term describes a soil with a gradual increase in texture (i.e. becomes more clayey) as the profile deepens.

Granite/granitic rocks A coarse-grained, *igneous* rock formed beneath the earth's surface and consisting essentially of 20-40% quartz, alkali feldspars (which are a source of sodium and potassium) and very commonly a mica.

Granite tors Tower-like blocks of unweathered granite rock standing above the surrounding area.

Gypsic Soils with a gypsic horizon. This is one that contains more than 20% of visible gypsum that is apparently of pedogenic origin, and has a minimum thickness of 0.1 m. This term is used as a definition within a number of Soil Orders in the Australian Soil Classification (Isbell, 1996).

Gypsum A naturally occurring soft crystalline material which is a hydrated form of calcium sulphate. Gypsum contains approximately 23% calcium and 18% sulphur. It is used to improve soil structure and reduce crusting in hard setting clayey soils.

Haplic A term used in the Australian Soil Classification (Isbell, 1996) which indicates that the major part of the upper 0.5 m of the soil profile is whole coloured.

Hardsetting Surface soil that becomes hard and apparently structureless on the periodic drying of the soil.

Hillslope Landform pattern with a gently inclined to precipitous slope.

Horizon See *Soil horizon,* also *Soil horizon boundary*

Humus Dark organic material in soils, produced by the decomposition of animal or vegetable matter.

Hypercalcic These soils have a B horizon or subsurface layer containing more than 20% of mainly soft, finely divided carbonate, and less than 20% of hard calcrete fragments and/or carbonate nodules, and/or carbonate coated gravel. The term is used as a definition for a number of Orders in the Australian Soil Classification (Isbell, 1996).

Hypernatric Soils in which the major part of the upper 0.2 m of the B2 horizon has an ESP greater than 25. It is used as a Subgroup definition for Sodosols in the Australian Soil Classification (Isbell, 1996).

Igneous rock	Rock crystallised from molten rock material (magma). It may be extruded to the Earth's surface (volcanic) or cool at variable depths below the surface (intrusive, and plutonic).
Interbasaltic	Lying between layers of basalt.
Jump-ups	Local term used to describe stony, lateritised ridges and scarps.
Kandosol	A Soil Order of the Australian Soil Classification (Isbell, 1996). These soils lack strong texture contrast and have massive or only weakly structured B horizons. The B2 horizon is well developed and has a maximum clay content in some part of the B2 horizon which exceeds 15%. They are also not calcareous throughout.
Kaolinisation	Breakdown of minerals (particularly feldspars) under intense weathering to form kaolinite clay (china clay).
Kurosol	A Soil Order of the Australian Soil Classification (Isbell, 1996). Soils with strong texture contrast between A horizons and strongly acid B horizons. Many of these soils have some unusual subsoil chemical features (high magnesium, sodium and aluminium).
Laterite	A profile formed by intense weathering. Many deeply weathered profiles termed 'lateritic' exhibit a distinct series of layers including a surface duricrust, ironstone and mottled and pallid (kaolinised) zones. The word laterite is used for any profile in which ironstone is a major feature. See *Duricrust.*
Lateritised rocks	Rocks which have been partially or completely weathered to laterite.
Leaching	The removal in solution of soluble minerals and salts as water moves through the soil profile.
Levee	An embankment constructed to contain floods from a river. Can refer to natural embankments formed by deposition of sediments from flood flows.
Lithology	Nature of rocks as seen in hand specimens, on the basis of colour, grain size and composition.
Local relief	The altitude difference between the base and crest of slopes in undulating or hilly areas.
Low hills	Landform pattern of low relief (30-90 m) and gentle to very steep slopes.
Magnesic	Soils with an exchangeable Ca/Mg ratio of less than 0.1 in the major part of the B2 horizon. This term is used as a definition within a number of Soil Orders in the Australian Soil Classification (Isbell, 1996).
Massive earths	See *Earths, massive.*
Massive structure	See *Soil structure (apedal).*

Mesonatric	Soils in which the major part of the upper 0.2 m of the B2 horizon has an ESP between 15 and 25. Used as a Great Group definition for Sodosols in the Australian Soil Classification (Isbell, 1996).
Metamorphic rocks	Rocks that were originally igneous or sedimentary that have been physically and / or chemically altered by high temperatures and / or pressures beneath the Earth's surface.
Mineralisation	The breakdown of soil organic matter and crop and animal residues by micro-organisms to inorganic (available) forms.
Mottle	Spots, blotches or streaks of subdominant colours different from the main soil colour.
Natric	Soils in which the major part of the upper 0.2 m of the B2 horizon is sodic. Used as a Great Group definition for Kurosols in the Australian Soil Classification (Isbell, 1996).
Nodules (in soil)	See *Segregation.*
Non-cracking clays	See *Clays, non-cracking.*
Orthic	Soils which usually have a weakly developed B horizon (in terms of contrast between A horizons above and adjacent horizons below), or a B horizon with 15% clay (SL-) or less, or a transitional horizon (C/B) occurring in fissures in the parent rock which contains between 10 and 50% of B horizon material (including pedogenic carbonate).
Pans	A hard and/or cemented soil horizon e.g. cultivation pan.
Paralithic	A term used in the Australian Soil Classification (Isbell, 1996) to define soil material which directly overlies partially weathered or decomposed rock or saprolite.
Parent material	The rock from which a soil profile develops.
Permeability	The capacity for transmission under gravity of water through soil or sediments.
Plain	Level to undulating or rarely, rolling landform pattern of extremely low relief (less than 9 m).
pH	A measure of the acidity or alkalinity of a soil. A pH of 7.0 indicates neutrality, higher values indicate alkalinity and lower values indicate acidity. Each unit change in pH represents a 10-fold change in either the acidity or alkalinity of the soil. For example, a pH of 5.0 is 10 times more acid than a pH of 6.0. Soil pH affects the amount of different nutrients that are soluble in water and therefore the amount of nutrient available to plants.
Regolithic	A term used to describe soils with a layer of unconsolidated mineral material beneath the soil profile. The term is used in the Australian Soil Classification (Isbell, 1996).

Rises Landform pattern of very low relief (9-30 m) and very gentle to steep slopes.

Rudosol A Soil Order of the Australian Soil Classification (Isbell, 1996). This order is designed to accommodate soils that have negligible pedologic organisation. They are usually young soils in the sense that soil forming factors have had little time to pedologically modify parent rocks or sediments.

Salinity The presence of sufficient soluble salts to adversely affect plant growth and/or land use. The main salt involved is sodium chloride, but sulphates, carbonates and magnesium salts occur in some soils. It is expressed as a level of electrical conductivity (EC). See *Electrical conductivity.*

Sands Soils with a uniform sand (including sandy loam) texture throughout the surface soil and subsoil.

Saprolite Decomposed rock that has maintained characteristics that were present as an unweathered rock.

Sedimentary rocks Rocks formed from the accumulation of material which has been weathered and eroded from pre-existing rocks, then transported and deposited as sediment by wind (aeolian) or water (fluvial, marine). Sedimentary rocks have been classified according to grain size and constituent minerals:

Clay-sized grains:	Mudstone
Sand-sized grains:	Sandstone
Silt-sized grains:	Siltstone
Gravel-sized grains:	Conglomerate

Sandstone is further subdivided on the basis of the dominant minerals making up the clasts (solid inclusions) or the matrix which cements the clasts together:
90% or more of grains are quartz: Quartzose sandstone.
less than 75% of grains are quartz: Labile sandstone.

Segregation Discrete accumulations of minerals in the soil because of the concentration of some constituent, usually by chemical or ' biological action. Segregations are described by their nature, abundance and form.

1) nature for example, calcareous (carbonate), gypseous (gypsum), manganiferous (manganese) and ferro-manganiferous (iron-manganese).

2)abundance

very few (trace or occasional)	<2%
few (slight)	2-10%
common (light)	10-20%
many (moderate)	20-50%
very many (heavy)	>50%

3) form

Concretions	- spheroidal formations (concentric in nature)
Nodules	- irregular rounded formations (not concentric or symmetric). Can have a hollow interior.

Fragments	- broken pieces of segregations.
Crystals	- single or complex clusters of visible crystals.
Soft segregations	- finely divided soft segregations accumulated in the soil through chemical action with water. They contrast with surrounding soil in colour and composition but are not easily separated from the soil as separate bodies.
Veins	- fine (<2 mm wide) linear segregations.
Laminae	- planar, plate-like or sheet-like segregations.

Self-mulching A condition of well-structured surface soil, notably of clays, in which the aggregates fall apart naturally as the soil dries to form a loose mulch of soil aggregates. In cultivated soils, ploughing when wet may appear to destroy the surface mulch which, however, will re-form upon drying.

Silicified Materials in which silica dominant minerals e.g. quartz, opal, have permeated and filled pores.

Slickensides Subsoil structural features which develop as a result of two masses moving past each other, polishing and smoothing the surfaces. These are common in Vertosols.

Snuffy Soils with an A horizon having a very fine granular structure (,2 mm) and a dry consistence strength that is weak to very weak. The horizon usually has a low bulk density and may be water repellent.

Sodicity A characteristic of soils (usually subsoils) containing exchangeable sodium to the extent of adversely affecting soil stability, plant growth and/or land use. It is measured as a percentage of the cation exchange capacity of the soil.
The classes are defined as follows:

non-sodic	- less than 6%
sodic	- between 6% and 15%
strongly sodic	- more than 15%

Sodosol A Soil of the Australian Soil classification (Isbell, 1996). These soils have a clear or abrupt textural B horizon in which the major part of the upper 0.2 m of the B2 horizon is sodic and is not strongly sub-plastic.

Soft segregations See *Segregation*.

Soil colour The colour of soil material is determined by comparison with a standard Munsell soil colour chart. The colours are described for moist soils unless otherwise stated.

The following depth ranges are used in this manual to describe the soil surface and soil profile depths.

Soil depth

1) soil surface	Thin	0–15 cm
	Moderately thick	15–30 cm
	Thick	30–60 cm
	Very thick	>60 cm
2) soil profile	Very shallow	<25 cm
	Shallow	25–50 cm
	Moderately deep	50–100 cm
	Deep	100–150 cm
	Very deep	150–500 cm

Soil horizon A layer of soil material within the soil profile with distinct characteristics and properties produced by soil-forming processes, and which are different from those of the layers above and/or below. The three main horizons are: A (topsoil); B (subsoil); C (*see C horizon*).

Soil horizon boundary Boundaries between horizons take many forms. The terms used in the soil descriptions of the *Field Manual* soil photographs and Appendix 3 (Resource Information) are:

Sharp – less than 5 mm wide;
Abrupt – 5 to 20 mm wide;
Clear – 20 to 50 mm wide;
Gradual – 50 to 100 mm wide;
Diffuse – more than 100 mm wide.

Soil intergrade A soil which contains properties of more than one described soil type. They are common between two related soils.

Soil profile A vertical cross-sectional exposure of a soil, from the surface to the parent material or *Substrate.*

Soil reaction trend The general direction of the change in pH with depth.

Soil structure The arrangement of natural soil aggregates that occur in soil; structure includes the distinctness, size and shape of these aggregates.

1) distinctness

— *strong* The natural soil aggregates are quite district in undisplaced soil; when displaced more the two-thirds of the soil material consists of aggregates (ie well structured)
— *moderate* Natural soil aggregates are well formed and evident but not distinct in undisplaced soil; when displaced more then one-third of the soil material consists of aggregates (ie moderately structured).
— *weak* The natural soil aggregates are indistinct and barely observable in undisplaced soil; when displaced up to one-third of the soil material consists of soil aggregates (poorly structured).

2) size

— *coarse* The natural soil aggregates are relatively large; an average size of 20mm or more is coarse for the purposes of this manual.
— *medium* The average size of the natural soil aggregates is between fine and coarse.
— *fine* The natural soil aggregates are relatively small; an average size of 5mm or less is fine for the purposes of this manual.

3) Shape

— *apedal* There are no observable natural soil aggregates (structureless); the soil may be either a coherent mass (massive) or a loose, incoherent mass of individual particles such as sand grains (single grain).
— *blocky* The natural soil aggregates have the approximate shape of cubes with flat and slightly rounded sides.
— *prismatic* The natural soil aggregates have the approximate shape of elongated blocks
— *columnar* The natural soil aggregates are like those of *prismatic* but have domed tops
— *polyhedral* The natural soil aggregates are irregular, many sided and multiangled.
— *lenticular* The natural soil aggregates are like large vertical lens shapes with curved cracks between the aggregates.
— *platy* The soil particles are arranged around a horizontal plane and bounded by relatively flat horizontal faces.
— *granular* The natural soil aggregates are rounded, porous, stable and less than 12 mm in diameter. They usually occur in the surface horizons.

Soil texture

The coarseness or fineness of soil material as it affects the behaviour of a moist ball of soil when pressed between the thumb and forefinger. It is generally related to the proportion of clay, silt and sand within a soil. Texture classes used in this manual are defined primarily by the total clay content:

	Group	Clay Content (%)
Coarse	Sand	Less than 5
	Loamy Sand	5 to 10
	Sandy Loam	10 to 20
Medium	Loam	≈ 25
	Sandy clay loam	20 to 30 + sand
	Clay loam	30 to 35
Fine	Sandy clay	35 to 40 + sand
	Light clay	35 to 40
	Medium clay	40 to 50
	Heavy clay	more than 50

Solodic soils

Soils with strong texture contrasts between A horizons and sodic B horizons which are not strongly acid.

Structured earths

See *Earths (structured).*

Subnatric

A Great Group of the Australian Soil Classification (Isbell, 1996). A major part of the upper 0.2 m of the B horizon has an ESP between 6 and less

than 15. These soils are considered to be sodic (See *Sodicity).*

Subsoil Soil layers below the surface with one of the following attributes: a larger content of clay, iron, aluminium, organic material (or several of these) than the surface and subsurface soil; stronger colours than those of the surface and subsurface soil above, or the *substrate* below. The B horizon.

Substrate The material below the soil profile which may be the parent material or may be unlike the material from which the soil has formed; substrate which is not parent material for the soil above may be layers of older alluvium, rock strata unrelated to the soil or the buried surface of a former landscape.

Subsurface soil Soil layers immediately under the surface soil which usually have less organic matter, paler colours and may have less clay than the surface soil. The A2 horizon.

Surface crust Distinct surface layer, often laminated, ranging in thickness from a few millimetres to a few tens of millimetres, which is hard and brittle when dry and cannot be readily separated from and lifted off the underlying soil material.

Surface soil The soil layer extending from the soil surface down which has some organic matter accumulation and is darker in colour than the underlying soil layers. The A horizon.

Tenosol A Soil Order of the Australian Soil Classification (Isbell, 1996). These soils generally have weak pedological organisation throughout the profile apart from the A horizons.

Texture See *Soil texture.*

Texture contrast soil A soil in which there is a sharp change in soil texture between the A and B horizons (surface and subsoil) over a distance of 10 cm or less. Also known as a duplex soil.

Traprock A popular term used to describe a complex mixture of highly deformed sandstone and mudstone, interbedded conglomerate, limestone and volcanics.

Uniform clays *See Clays.*

Vertic Soils with a B horizon in which at least 0.3 m has a clayey field texture or 35% or more clay, which cracks strongly when dry and has slickensides and/or lenticular peds. It is used as a Subgroup definition in the Australian Soil Classification (Isbell, 1996).

Vertosol A Soil Order of the Australian Soil Classification (Isbell, 1996). These are clay soils with shrink/swell properties that display strong cracks when dry and have slickensides and/or lenticular structural aggregates at depth.

Volcanic Rocks	Igneous rocks which have cooled from magma extruded to the Earth's surface. The size of the rock crystals depends on its duration of cooling - rapid cooling forms very fine crystals or even volcanic glass.
- acid	Contain 10% or more quartz and proportions of magnesium, iron and calcium. Usually light coloured.
- basic	Basalt or basaltic rocks containing minimal or no quartz. Usually dark coloured because of a high proportion of iron and manganese minerals.
- intermediate	Contain less than 10% quartz and mixed amounts of other minerals that are intermediate between the typical acid and basic igneous rocks.
Waterlogging	A situation in which all the pores in the soil have filled with water. Excess water may lie on the surface of the soil. All the air in the pores has been displaced by water, so no oxygen is available to plant roots or for soil microbial activity. If waterlogging continues for a long period, plants die. Under waterlogged conditions, nitrate, the most available form of nitrogen, breaks down and is lost as a gas.