LAN Landseer Land System

Ranges extending from the Hundred of Duffield to the Hundred of Conmurra

Area: 474.0 km²

- Landscape: Complex of calcarenite ranges, including Reedy Creek Range and West Avenue Range, and corridor plains with irregular flats and swamps, which are progressively more saline from south to north.
- Annual rainfall: 565 665 mm average
- **Geology:** Calcreted calcarenite of the Pleistocene Bridgewater Formation on ridges, with Pleistocene lagoonal deposits of the Padthaway Formation on flats. The System is formed on an ancient coastal dune comprising mixed calcareous and siliceous sand which has hardened to calcarenite (Bridgewater Formation). There are extensive areas of Molineaux Sand overlying the range. These tend to be more widespread on the eastern (leeward) side. Small depressions within the range are geologically variable and may be infilled with locally derived outwash sediments, drift sand or swamp sediments. Sporadic granitic intrusions underlie the range and outcrop in places.
- **Topography**: The Landseer Land System is an undulating to rolling range of rounded rises and low hills with a NNW SSE orientation. It includes the Reedy Creek and West Avenue Ranges. They have an overall relief of 40 m and slopes of 3 20%. Isolated closed depressions are scattered throughout the range. These are swampy in places. A feature of the topography is the common occurrence of abrupt stony knobs. Most of the land is non arable.

Elevation: 10 - 50 m

Relief: Up to 40 m

 Main soils:
 H3 (21%) Bleached siliceous sand (sandy Bleached Tenosol)

B7 (19%) Shallow sand over clay on calcrete (sandy Petrocalcic Sodosol-Chromosol)

- I1 (17%) Highly leached sand (Aeric Podosol)
 - **RR** (14%) Bare calcrete rock

Minor soils:B3 (9%) Shallow sandy loam on calcrete(Petrocalcic Red Tenosol-Kandosol-Rudosol)B8 (5%) Shallow bleached sand on calcrete(sandy Petrocalcic Rudosol-Tenosol)B6 (4%) Shallow loam over red-brown clay on calcrete (Petrocalcic Red Chromosol-Kandosol)Kandosol)

Summary: The Landseer Land System is characterized by low hills with predominantly well drained moderately shallow to shallow sand over clay soils mixed with shallow stony soils and deep sands. Cropping is limited by low fertility, rocky reefs and the uneven land surface, as well as high soil variability. Depressions are minor overall, but have better productive potential, although swampiness and salinity are increasing.

The deep sands (H3, I1), which occupy 38% of the area, are typically found as dunes overlying the calcarenite range. These soils have high wind erodibility, are often water repellent, excessively drained and have low inherent fertility. Where they occur in sheltered situations can be utilised for growing deep-rooted perennials, and acid loving plants and species, which require good drainage. Shallow soils over calcrete occupy most of the rest of the land system. These generally have low moisture holding capacity and may offer only





minimal root depth potential unless ameliorative measures are undertaken. Swales and swamps tend to be moderately to highly saline.

Soil Landscape Unit summary: 53 Soil Landscape Units (SLUs) mapped in the Landseer Land System

SLU	% of area	Component	Main soils	Prop#	Notes
M-B	1.9	Rise	B3B8RR	D	$\mathbf{M} extsf{-B}$ Gently undulating rises, with very shallow red and brown
M-BA	0.9	Low rise	B3RR	D	loamy sand, occasionally over thin red clay, on calcrete, bare
			H3		calcrete, or thin bleached sand on calcrete; 10-30% deeper sandy
		Swale	G3B7B8	М	loam over red clay on calcrete or deep bleached siliceous sand.
M-C	9.9	Rise	RRB3	D	M-BA Gently undulating low rises with dune core topography with
M-g	0.3	Plain	B3RR	V	shallow sand , occasionally over thin red clay, on calcrete, or bare
		Swale	N3N2	L	calcrete; 10-30% deeper loamy sand over red clay on calcreted calcarenite. <10% swales with deep sand over brown clay, shallow bleached sand over calcrete, or over poorly structured brown clay on calcrete. M-C Undulating rises with shallow sandy loam, occasionally over thin red clay, on calcreted calcarenite, or bare calcrete; 10-30% deeper sandy loam over red clay on calcreted calcarenite. M-g Plains with soils as for M-C ; 10-20% wet swales with non- saline to moderately saline, loam over dark clay.
		sand on calcrete - B8 and <u>Rock or exp</u> <i>Swales:</i> <u>Thick sand over clay</u> - G3 , <u>San</u> <u>calcrete</u> - B7 and <u>Shallow sand on calc</u>	Rises and plains: Shallow sandy loam on calcrete - B3 , <u>Shallow</u> sand on calcrete - B8 and <u>Rock or exposed calcrete</u> – RR . Swales: <u>Thick sand over clay</u> - G3 , <u>Sand over friable brown clay on</u> <u>calcrete</u> - B7 and <u>Shallow sand on calcrete</u> - B8 or <u>Wet clay loam</u> -		
MAD				_	N3 and <u>Wet saline clay loam</u> - N2c.
MAB	0.5	Rise	B3RR	D	MAB Gently undulating calcreted former beach ridges with stony,
MABA	1.2	Low rise	B3RR	D	very shallow red and brown loam, occasionally over red clay, on C_{0}^{0}
MAC	0.02	Swale	G3B7B8	M	calcrete. >50% bare calcrete. MABA As above with low dune core ridges; 10- 30% deep
MAC	0.03	Rise	B3RR	D	bleached sand. <10% swales with deep sand over brown clay, or
					shallow bleached sand on poorly structured brown clay, of shallow bleached sand on poorly structured brown clay on calcrete, or bleached sand on calcrete; 10-30% deep highly leached sand. MAC Undulating rises, with soils as for MAB .
					Main soils: Rises: <u>Shallow sandy loam on calcrete</u> - B3 and <u>Rock or exposed</u> <u>calcrete</u> – RR . Swales: <u>Thick sand over clay</u> - G3 , <u>Sand over friable brown clay on</u> <u>calcrete</u> - B7 and <u>Shallow sand on calcrete</u> - B8 .
MCA	0.2	Plain	B6B3B8	D	Plains with shallow sand, often bleached, or over red clay, on calcrete; 10-30% shallow dark clay loam over dark clay on calcrete in low, wetter parts.
					Main soils: <u>Shallow sandy loam over red-brown clay on calcrete</u> - B6, <u>Shallow sandy loam on calcrete</u> - B3 and <u>Shallow sand on</u> <u>calcrete</u> - B8 .





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MEC	1 4	Const	11262	-	MEC Dashalation stress for the balls of the second
MEC	1.4	Sand rise	H3G2	E	MEC Undulating stony rises with shallow sandy loam, occasionally
		Stony rise	B3B2	E	on red clay, on calcreted calcarenite; 10-30% either deeper with
MELL		Swale	B6B7	L	deeper red clay or shallower bleached sand on calcreted calcarenite
MEU	0.2	Gently	B3B8RR	V	MEU Gently undulating plains with shallow loamy sand, over thin
		undulating			red sandy clay loam on calcreted calcarenite, or shallow bleached
		plain	DCNID		sand over calcrete, or bare calcrete. 10-20% swales with shallow
		Swale	B6N3	L	loam over red clay on calcrete, or wet non-saline soils in low parts.
					Main soils:
					Sandy rises: <u>Bleached siliceous sand</u> - H3 and <u>Bleached sand over</u>
					sandy clay loam - G2.
					Stony rises: Shallow sandy loam on calcrete - B3 and Shallow
					<u>calcareous loam on calcrete</u> - B2 .
					Swales: Shallow sandy loam over red-brown clay on calcrete - B6,
N / I I A	0.2	DI .	11262		Sand over friable brown clay on calcrete - B7 ; <u>Wet clay loam</u> - N3 .
MHA	0.3	Plain	H3G3	D	MHA Plains with deep bleached sand, or deep sand over brown
					clay.
MHAA	0.1	Plain	H3G3	V	MHAA Plains with low dune core topography, and soils as for
					 MHA, but also 10-30% deep siliceous, highly leached sand. MHB Gently sloping dunes on ranges with deep, bleached
		Sandy rise	H3G2	С	siliceous sand. Co-dominant stony ranges have shallow sand, often
					 bleached, on calcreted calcarenite, or bare calcrete; 10-30% deeper
MHB	5.9	Dune	H3	Е	sand over red clay on calcrete.
					MHC Undulating slopes on dune ranges with deep bleached, to
		Stony range	B3RRB8	Е	highly leached sand, or shallow sand over poorly structured brown
					clay on calcreted calcarenite; 10-30% bare calcrete, shallow sand
MHC	51.2	Dune range	H3I1B7	V	over thin red sandy clay on calcrete, or deep sand over organic
					pans. 10-20% stony ranges with shallow sand, often bleached, , on
		Stony range	B3RRB8	L	calcreted calcarenite, or bare calcrete; 10-30% deeper sandy loam
					over red clay, on calcrete. <10% swales with deep sand over brown
		Swale	G3B7B8	М	clay, shallow sand over brown clay on calcrete, or shallow bleached
					sand on calcrete.
MHD	0.1	Slope	B3B8RR	D	MHD Rolling range slopes with soils as for MHC stony range
	0.1	2.000	2020111		component.
MHE	0.2	Undulating	H3B6B8	D	MHE Undulating swales with deep bleached loamy sand, shallow
		swale			sandy loam over red clay on calcreted calcarenite, or shallow
MUL	0.0	Dico	כווכם	 	bleached sand on calcrete.
MHh	0.6	Rise	B3H3	E	\mathbf{MHh} Gently sloping rises with shallow sand over thin reddish
		EL.	C 4 4 7	-	sandy clay on calcreted calcarenite, or deep bleached sand; 10-30%
		Flat	G4A7	E	deep, bleached sand over red-brown sandy clay, shallow sand over
MHI	13.2	Dune range	H3I1B7	D	poorly structured brown clay on calcrete or shallow sandy loam
.,	±0.2	Dane runge	1.51107		over red clay on calcrete. Co-dominant flats with shallow sand over
		Swala	C20700	М	poorly structured brown clay, or deep gradational calcareous loam
		Swale	G3B7B8	IVI	over calcareous grey clay, on marl.
MHn	0.1	Sand rise	H3G2	V	MHI Undulating dune ranges with deep bleached to highly
.,	0.1		11302	ľ	leached acidic sand, or shallow sand over poorly structured brown
		Chara -	0204	<u> </u>	clay on calcreted calcarenite; 10-30% bare calcrete, shallow sandy
		Stony rise	B3B4	L	loam on calcrete, or deep sand with impeded drainage on organic
		6			pans. <10% swales with deep sand over brown clay, shallow sand
		Swamp	N2	М	over brown clay on calcrete, or shallow bleached sand on calcrete.
MIL	0.1	Conductor	11262		MHn Gently undulating sand rises with deep bleached sand, or bleached sand over red-brown sandy clay. 10-20% stony rises with
MHt	0.1	Sand rise	H3G2	V	shallow sandy loam over calcrete, or clay loam over red clay on
					calcrete; 10-30% sandy loam over poorly structured brown clay on
		Swamp	N2	С	calcrete, or calcareous sandy loam on calcareous, or bleached sand
					calciete, or calcareous sality loant off calcareous, of bleached salid





		Stony rise	B3B4	L	over red-brown sandy clay. <10% swamps with wet, moderately				
					highly to very highly saline sand over dark brown clay.				
MHV	0.4	Sand rise	H3	V	MHt Gently undulating sand rises, swamps and stony rises with soils as for MHn . 20-30% saline swamps. 10-20% stony rises.				
		Stony rise	B3B4	С	MHV Gently undulating sand rises with deep bleached siliceous sand. 20-30% stony rises with soils as for MHn . 10-20% swales				
		Swale	G3	L	with deep sand over brown clay.				
		Swale	05	L	Main soils:				
					Plains: Bleached siliceous sand - H3 and Thick sand over clay - G3.				
					Dunes: Bleached siliceous sand - H3.				
					Stony ranges and slopes: <u>Shallow sandy loam on calcrete</u> - B3 and <u>Rock or exposed calcrete</u> – RR and <u>Shallow sand on calcrete</u> -				
					B8.				
					Dune ranges: <u>Bleached siliceous sand</u> - H3 , <u>Highly leached sand</u> - I1 and <u>Sand over friable brown clay on calcrete</u> - B7 .				
					Sandy rises: Bleached siliceous sand - H3 and Bleached sand over				
					sandy clay loam - G2 .				
					Swales: Thick sand over clay - G3, Bleached siliceous sand - H3, Shallow sandy loam over red-brown clay on calcrete - B6, Sand				
					over friable brown clay on calcrete - B7 and <u>Shallow sand on</u>				
					<u>calcrete</u> - B8 .				
					Stony rises: Shallow sandy loam on calcrete - B3 and Shallow red				
					<u>loam on limestone</u> - B4 . <i>Swamps:</i> <u>Wet saline clay loam</u> - N2c .				
					Non-stony rises: Shallow sandy loam on calcrete - B3 and				
					Bleached siliceous sand - H3				
MHC	51.2	Pango compris	sing undu	lating to	Flats: Sand over yellow and brown clay - G4; Calcareous loam - A7.				
MHD	0.1	Range comprising undulating to rolling rises and low hills formed on calcreted calcarenite and overlain by siliceous sand. There is up to 40 m relief. Slopes vary from 3-10% and are up to 20% in							
MHh	0.6	places. There is	s variable	surface o	alcrete, depending on presence of sand. 10-20% stone cover is				
					bout 20% of the land surface is too rocky to have warranted clearing.				
		sediments.	ssions and	d flats wi	thin the range are underlain by limestone or clayey lagoonal				
			range.						
					cised through the range, linking the Minecrow and Ross flats.				
			•	•	about 50% calcarenite rises and 50% flats.				
		Main soils: <u>deep bleached sand</u> - H3 (E) on sandy areas, with <u>sand over clay on calcrete</u> - B7a (C), <u>shallow stony sandy loam on calcrete</u> - B3/B2 (L) and <u>thick bleached sand on calcrete</u> - B8 (M) on							
		stony areas. Loamy sand over clay - D1 (M) occurs sporadically on granite outcrops. Loamy sand over							
		<u>brown sandy c</u>	lay on cal	<u>crete</u> - B	7b (M) and <u>calcareous loam</u> - A7 (M) occur on flats.				
		Key properties							
		Drainage:			well drained.				
		Fertility: Physical condit			n deep sands to moderately low on stony soils. Is are soft to loose and do not restrict root growth.				
		i nysical contai			soils occur they are friable and not restrictive to root growth.				
		AWHC:	Μ	oderate o	on sandy soils. Very low to low on stony soils, due to shallow depth to				
		Colinita		rd calcre	te.				
		Salinity: Erosion potent		w. ater: Lo	w to moderate, depending on slope.				
					gh on sand spreads to moderately low on stony ground.				
		Water repellen			sand spreads. Low to slight on stony land.				
		Rockiness:			l spreads. Variable to 50%, usually less than 20%.				
		Other:		0	rises are exposed.				
		-	-		nated by deep, low fertility, water repellent and erodible sands, with ony soils of marginal fertility.				
		moderately sh	ฉกอพ เป ร	nanow St	ony sons of marginal icitility.				





MiO	0.9	Plain	B8B7	D	Plains with shallow bleached sand over calcrete, or over poorly
MIO	0.9	Swale	N3B2	M	structured brown clay on calcrete. <10% swales with often wet,
		Swale	NJDZ	101	shallow calcareous loam over calcrete.
					Main soils:
					Plains: Shallow sand on calcrete - B8 and Sand over friable brown
					<u>clay on calcrete</u> - B7 .
					Swales: Wet clay loam - N3 and Shallow calcareous loam on
MLF	0.2	Stoop ropoo	B3RRH3	D	<u>calcrete</u> - B2 .
MILF	0.2	Steep range	БЭККПЭ	D	Steep range with shallow loamy sand over very thin red sandy clay on calcrete, bare calcrete, or deep bleached sand.
					Main soils: <u>Shallow sandy loam on calcrete</u> - B3 , <u>Rock or exposed</u> <u>calcrete</u> – RR and <u>Bleached siliceous sand</u> - H3 .
MtBA	1.5	Rise	B3B6	V	Gently sloping rises with low dune core topography, with shallow
		Swale	B7	L	sandy loam, often over red clay, on calcrete; 10-30% bare calcrete.
					10-20% swales with shallow sand over poorly structured brown
					clay on calcrete; 10-30% bare calcrete, or shallow sandy loam over
					red clay on calcrete, or deep sand over brown clay.
					Main soils:
					Rises: Shallow sandy loam on calcrete - B3 , and Shallow sandy
					loam over red-brown clay on calcrete - B6 .
					Swales: Sand over friable brown clay on calcrete - B7.
MWB	0.3	Gently	B7B6	D	Gently undulating plains with shallow loamy sand over red clay on
		undulating			calcreted calcarenite; 10-30% bare calcrete, or shallow sandy loam
		plain			on calcrete.
					Main soils: Sand over friable brown clay on calcrete - B7 and
					Shallow sandy loam over red-brown clay on calcrete - B6 .
NBA	0.1	Plain	B2B7	D	NBA Plains with mostly shallow calcareous loam on calcrete, or
NBC	0.2	Current alatie	D 2		shallow loam over poorly structured brown clay on calcrete; 10-
NDC	0.3	Stony plain	B2	D	30% shallow bleached sand on calcrete, or gradational calcareous
NBI	0.2	Stony rise	B2RR	M V	loam over calcareous grey clay on marl.
INDI	0.2	Stony plain Swamp	B5B2 B2N3N1	C V	NBC Plains with very shallow calcareous sandy loam on calcrete;
NBu	0.02	Plain	N2B5	V	10-30% shallow sandy loam over poorly structured brown clay on
NDu	0.02	Salt pan	N2	C	calcrete. <10% stony rises with very shallow calcareous sandy loam
		Lunette	A8	L	on calcrete, or bare calcrete.
		Lunette	AO	L .	NBI Stony plains with shallow dark cracking clay on calcrete, or
					shallow calcareous grey clay on calcrete. 20-30% swamps with
					shallow calcareous loam on calcrete, or wet organic loam or peat.
					NBu Plains with wet, moderately highly saline dark cracking clay mostly over calcrete. 20-30% salt pans with wet highly saline dark
					clay with salt crusted surface; 10-30% water filled. 10-20% lunettes
					with gradational calcareous clay loam over gypseous grey clay.
					Main soils:
					Swampy and stony plains: Shallow calcareous loam on calcrete -
					B2 , <u>Sand over friable brown clay on calcrete</u> - B7 , <u>Shallow dark clay</u>
					loam on limestone - B5 and <u>Wet saline clay loam</u> - N2c .
					Swamps: Shallow calcareous loam on calcrete - B2, Wet clay loam - N3 and Peaty soil – N1.
					Stony rises: Shallow calcareous loam on calcrete - B2 and Rock or
					exposed calcrete – RR .
					Salt pans: Wet saline clay loam - N2c.
					Lunettes: Gypseous calcareous loam – A8.
NTa	0.8	Flat	G3	D	NTa Flats with deep sand over brown clay; 10-30% thin sand over
		Swamp	G4N2	M	poorly structured brown clay. <10% swamps with often wet,
NTA	0.3	Plain	G3	D	slightly saline, thin sand over poorly structured brown clay; 10-30%
-				1	





Swamp G4N2 M deep sand over brown day. NTG 0.1 Depression G4N2 D NTG 0.1 Depression G4N2 D NTG 0.1 Depression G4N2 E Swamp G4N2 E Swamp orderates saline, this and over poorly structured brown day. 10.30% NTS 0.1 Flat G3 L over poorly structured brown day. 10.30% NTS 0.1 Flat G3 L over poorly structured brown day. 10.30% NTV 0.2 Flat G3 E NTG Poly structured brown day. 10.30% Swamp G4N2 L NTK Flats with slighty saline deep sand over brown day. 10.30% Storny rise B3R L Co-dominant swamps with othen wet, moderately saline, thin sand over poorly structured brown day. 10.30% Storny rise B3R L Co-dominant swamps with othen wet, moderately saline, thin sand over poorly structured brown day. 10.30% Storny rise B3R L Co-dominant swamps with o			Swamp	C4N2	М	doop cand over brown clay
NTG 0.1 Degression offer vet moderately saline, thin sand over poorly structured brown day. 109% semptily sand rise C4N2 E NTB 0.2 Flat G3 E brown clay. 10-30% deep sand over brown clay. NITG boots Solid State Solid S	NTa	0.1				
NTk 0.2 Flat G3 E often wet, moderately saline, thin sand over poory structured brown clay. NTs 0.1 Flat G3 L NTg Depressions with often wet and moderately saline, thin sand over poory structured brown clay. NTg Depressions with often wet and slightly saline, thin sand over poory structured brown clay. NTv 0.2 Flat G3 C Poorly structured brown clay. NTG Depressions with often wet and slightly saline, thin sand over poorly structured brown clay. NTv 0.2 Flat G3 L Poorly structured brown clay. NTG Depressions with often wet, moderately saline, thin sand over poorly structured brown clay. Sand rise G3 L Co-dominant swamps with often wet, moderately saline, thin sand over poorly structured brown clay. Dover poorly structured						
Swamp G4N2 E brown clay: 10-30% deep sand over brown clay: NTs 0.1 Flat G3 L Swamp G4N2 C NTg Depressions with often wet and moderately saline, thin sand over poorly structured brown clay: 10-30% deep sand over brown clay: NTv 0.2 Flat G3 E Swamp G4N2 C NTG Depressions with often wet and slightly saline, thin sand over poorly structured brown clay: 10-30% deep sand over brown clay: 10-30% deep san						
Sand rise G3 L NT Out Flat G3 V NTs 0.1 Flat G3 V over poorly structured brown clay; 10-30% deep sand over brown clay; NTv 0.2 Flat G3 C NTV Flat G3 E Swamp G4N2 C NTK Flats with slightly saline deep sand over brown clay; 10-30% deep sand over brown clay; 0.2 Sand rise G3 L C-dominant swamps with often wet and moderately saline, thin sand over poorly structured brown clay. C-dominant swamps with often wet, moderately saline, thin sand over poorly structured brown clay. C-dominant swamps with often wet, moderately saline, thin sand over poorly structured brown clay. NTX Flats sind size and over brown clay. C-dominant swamps with often wet, moderately saline, thin sand ver poly structured brown clay. NTX Flats sind size and over solve story rises with shallow sand over clay class. NTX flats sind sand vises. NTX flats sind sand ver clay class. Sind vise. Sind vise. <td>INIK</td> <td>0.2</td> <td></td> <td></td> <td></td> <td></td>	INIK	0.2				
NTs 0.1 Flat G3 V Swamp G33 V over poorly structured brown clay; 10-30% deep sand over brown clay; 0-30% NTv 0.2 Flat G3 E Swamp G4N2 L NTG Depressions with often wet and slightly saline, thin sand over poorly structured brown clay; 10-30% deep sand over brown clay; 10-30% Sand rise G3 L V NTK fistion forth wet shiftly saline deep sand over brown clay; 10-30% deep sand over red-brown sand; clay: 10-30% deep sand over brown slaw; 10-30% deep sand over brown slaw; 10-30% deep sand sand; 10-30% deep sand over brown slaw; 10-30% deep sand over red-brown sand; clay: NTK Flats, sandy rises and swamps sith solits as above. 20-30% sandy rises and 200% sandy ri						
NTV O2 Flat G3 C Swamp GAN2 L NIG Depressions with often wet and slightly saline, thin sand over poorly structured brown clay, 10-30% deep sand over brown clay. NTV 0.2 Flat G3 L Swamp GAN2 C Thick Hats with slightly saline deep sand over brown clay. Story rise B3RR L Co-dominant swamps with often wet, moderately saline, thin sand over poorly structured brown clay. Story rise B3RR L Co-dominant swamps with often wet, moderately saline, thin sand over poorly structured brown clay. NTN Moderately saline, flats, swamps and sandy rises as for NTL 20-30% swamps. NTN Moderately saline, flats, swamps and sandy rises as for NTL 20-30% swamps. NTS flats and sandy rises. 10-20% story rises with shallow sand over clay: C-30% story rises with shallow sand over clay: class. -64 NZA 0.2 Flat G4 V Story rise: Shallow sand vare calcrete. NZA NZS 0.8 Plain G4 V Story rise: Shallow sand vare calcrete. NZA Swamp N3 C Story rise: Shallow cand vare or calcrete. NZA	NTe	0.1				
Join Old Distance Distance Distance NTV 0.2 Flat G3 E Swamp G4N2 L portly structured brown clay: 10-30% deep sand over brown clay: 10-30% Sand rise G3 L Co-dominant swamps with often wet, moderately saline, thin sand over poorly structured brown clay: 10-30% deep sand over brown sandy clay. NTx Flat B3RR L Co-dominant swamps with often wet, moderately saline, thin sand over poorly structured brown clay: 10-30% deep sand over trown sandy clay. NTX Flat G4 NTX Flats, sandy rises and sandy rises as for NTL 20-30% sandy rises. NTV Moderately saline, flats, smamps and sandy rises as for NTL 20-30% sandy rises. NTW Moderately saline, flats, smamps and sandy rises as for NTL 20-30% sandy rises. NTX Plain G4 D NTX NTW Moderately saline, flats, smamps and sandy rises as for NTL 20-30% sandy rises. NZS 0.8 Plain G4 D NTZS Plain G4 D <td< td=""><td>1115</td><td>0.1</td><td></td><td></td><td>-</td><td></td></td<>	1115	0.1			-	
NTv 0.2 Swamp Flat 0.3 G4N2 CC Sand rise G3 L VTK Flats with sightly saline deps and over brown clay: 10-30% thin sand over poorly structured brown clay: 10-30% thin sand over poorly structured brown clay: 10-30% deep bleached sand over radium clay: 10-20% samps and sandy rises as for NTk. 20-30% swamps. 10-20% samps and sandy rises as for NTk. 20-30% swamps. 10-20% samps and sandy rises as for NTk. 20-30% swamps. 10-20% samps and sandy rises as for NTk. 20-30% swamps. 10-20% samps and sandy rises as for NTk. 20-30% swamps. 10-20% samps and sandy rises as for NTk. 20-30% swamps. 10-20% samps and sandy rises as for NTk. 20-30% swamps. 10-20% samps sand over poorly structured brown clay: 10-30% deep sand over poorly 40 structured brown clay or clay: 40 structured brown clay 40 structured brown clay or clay: 40 structured brown 40 structured brown clay or clay: 40 structured brown 40 structured brown clay: 40 structured brown clay or clay 40 structured brown clay or clay clay and vises with deep 40 bleached siliceous sand and 10-30% bleached sand over 40 structured brown sandy clay. 40 structured brown sandy clay. 40 structured brown sa						
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Sandy rise HS E Main soils: Dunes and sandy rises: Bleached siliceous sand - H3. Stony rises: Shallow sandy loam on calcrete - B3 and Shallow red loam on limestone - B4. Xtf 0.1 Swamp B5N3 V Swamps with often wet, shallow dark loam over dark clay on	OLH	0.2	Sand dune	H3	E	OLH High dunes with deep bleached siliceous sand. Co-dominant low sandy rises with deep bleached siliceous sand and 10-30%
Xtf 0.1 Swamp B5N3 V Main soils: Dunes and sandy rises: Bleached siliceous sand - H3. Stony rises: Shallow sandy loam on calcrete - B3 and Shallow red loam on limestone - B4.			Sandy rise	H3	E	bleached sand over brown sandy clay.
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Xtf 0.1 Swamp B5N3 V Stony rises: Shallow sandy loam on calcrete - B3 and Shallow red loam on limestone - B4. Xtf 0.1 Swamp						Dunes and sandy rises: Bleached siliceous sand - H3.
Xtf 0.1 Swamp B5N3 V Swamps with often wet, shallow dark loam over dark clay on						
Rise B2B3 C calcrete; 10-30% peat soils. 20-30% rises with thin calcareous loam	Xtf	0.1	Swamp	B5N3	V	Swamps with often wet, shallow dark loam over dark clay on
			Rise	B2B3	С	calcrete; 10-30% peat soils. 20-30% rises with thin calcareous loam





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					over calcrete, often loam over very thin red clay over calcrete; 10-
					30% bare calcrete, or clay loam over grey-brown clay on calcrete.
					Main soils:
					Swamps: Shallow dark clay loam on limestone - B5 and Wet clay
					loam - N3.
					Rises: Shallow calcareous loam on calcrete - B2 and Shallow sandy
					loam on calcrete - B3.
XuC	0.3	Swamp	N3	D	XuC Swamps with non-peaty wet sand over dark clay; 10-30% wet
Xud	0.1	Swamp	N3	V	peat.
2100	0.1	Sandy rise	G3I2	L	Xud Swamps with wet, dark organic loam over dark clay, 10-
Xuf	1.9	Swamp	N3	V	30%deep dark clay loam over dark brown poorly structured clay.
Aui	1.5	Stony rise	B2B3	C	10-20% sandy rises and hummocks, with deep sand often over,
XuF	0.1	Swamp	N3	D	poorly structured brown clay or organic pans.
Xui	0.1	•		V	Xuf Swamps as above; 20-30% stony rises with shallow often
Aui	0.5	Swamp Stopy rice	N3	-	calcareous, grey clay loam, often over dark grey clay, on calcrete.
VV	0.1	Stony rise	B2B3	C	XuF Swamps as above; 20-30% water filled or moderately saline,
XuX	0.1	Swamp	N2N3B5	D	2-10% highly saline patches.
					Xui Swamps as for XuF , 20-30% stony rises with shallow, often
					calcareous, loam on calcrete; 10-30% with shallow dark clay loam
					over dark clay on calcrete.
					XuX Swamps with wet, marginally saline and non saline, dark clay
					loam over dark clay, often shallow over calcrete.
					-
					Main soils:
					Swamps: Wet clay loam - N3, Wet saline clay loam - N2c and
					<u>Shallow dark clay loam on limestone</u> - B5 .
					Sandy rises: Thick sand over clay - G3; Wet highly leached sand -
					12.
					Stony rises: Shallow calcareous loam on calcrete - B2 and Shallow
70					sandy loam on calcrete - B3.
ZD-	0.4	Salt lake	N2	D	Salt lake with highly saline clay loam over clay, bare salt encrusted
					surface common; 10-30% water filled.
					Main soils: <u>Wet saline clay loam</u> - N2c .
ZK-	0.3	Swampy flat	N3N2	E	Swampy flats with wet, often saline, dark deep clay loam over dark
			M4		clay; 10-30% water filled, or gradational calcareous loam over
		Lunette	B5B9	E	calcareous grey clay on marl. Co-dominant lunettes with shallow
					dark clay loam over dark or olive-brown clay on calcrete; 10-30%
					shallow clay loam, often calcareous, on calcrete.
					Main soils:
					Swamps: Wet clay loam - N3, Wet saline clay loam - N2c and
					Deep hard gradational sandy loam - M4.
					Lunettes: Shallow dark clay loam on limestone - B5 and <u>Shallow</u>
70	0.1	Swamper flat	NICO		<u>clay loam over brown or dark clay on calcrete</u> - B9 .
Zo-	0.1	Swampy flat	N2G3	D	Swampy flats with moderate to high salinity. Soils are often wet,
					deep sand over brown clay.
					Main soils: Wet saline clay loam - N2c; Thick sand over clay - G3.
Zpk	0.2	Flat	G4G3	E	Moderately to highly saline plains with thin to thick sand over
			N2		poorly structured brown clay, often wet. Co-dominant swamps with
		Swamp	N2	Е	highly to slightly saline, mostly wet, sandy clay loam over dark clay;
		Sandy rise	G3	L	10-30% sand or clay loam over poorly structured brown clay. 10-
		-			20% sandy rises with deep sand over brown clay; 10-30% deep
					bleached sand or bleached sand over red-brown sandy clay.
					Main soils:
			1		
					Flats: Sand over yellow and brown clay - G4 . Thick sand over clay
					Flats: Sand over yellow and brown clay - G4, Thick sand over clay - G3 and Wet saling clay loam - N2c
					Flats: Sand over yellow and brown clay - G4, Thick sand over clay - G3 and Wet saline clay loam - N2c. Swamps: Wet saline clay loam - N2c.





					Sandy rises: Thick sand over clay - G3.
ZS-	0.1	Swamp	N2	D	Highly saline swamp with bare salt crust.
					Main soils: <u>Wet saline clay loam</u> - N2c .
Zsk	0.6	Flat	G4N2	Е	Saline swamps, flat and sandy rises with soils as for as for Zpk ;
		Swamp	N2	Е	Flats and swamps are co-dominant, <10% sandy rises.
		Sandy rise	G3	М	Main soils:
					Flats: Sand over yellow and brown clay - G4 and Wet saline clay
					<u>loam</u> - N2c .
					Swamps: Wet saline clay loam - N2c.
					Sandy rises: Thick sand over clay - G3.

PROPORTION codes assigned to Soil Landscape Unit (SLU) components:

- D Dominant in extent (>90% of SLU)
- V Very extensive in extent (60–90% of SLU)
- E Extensive in extent (30–60% of SLU)
- C Common in extent (20–30% of SLU)
- L Limited in extent (10–20% of SLU)
- M Minor in extent (<10% of SLU)

Detailed soil profile descriptions:

- A7 <u>Calcareous clay loam on marl (Marly Calcarosol)</u>
 Dark calcareous clay with marly subsoil (often saline in Upper SE). Often with shells and a peaty surface.
- A8 <u>Gypseous calcareous loam (Gypseous Calcarosol</u>)
 Calcareous soil with a Gypsic horizon) (>20% visual gypsum in a horizon which is at least 10cm thick).
 Found on lunettes, flats, etc.
- **B2** <u>Shallow calcareous sandy loam on calcrete (Petrocalcic Calcarosol)</u> Up to 40 cm calcareous loamy sand to sandy loam with variable calcrete rubble overlying calcreted calcarenite - rises.
- **B3** <u>Shallow sandy loam on calcrete (Petrocalcic Rudosol)</u> Medium thickness non-calcareous sandy loam, often having a slight clay increase with depth, over calcreted calcarenite shallower than 50 cm - rises.
- B4 <u>Red sandy loam over calcrete (Petrocalcic, Red Dermosol)</u> Medium thickness red sandy loam grading to friable red clay loam over calcreted calcarenite within 50 cm - rises.
- **B5** Shallow dark clay loam on limestone (Petrocalcic, Black Dermosol) Black clay loam to light clay over calcreted limestone at shallow depth, grading to highly calcareous clay - flats.
- **B6** <u>Shallow sandy loam over red-brown clay on calcrete (Petrocalcic, Red Kandosol)</u> Medium thickness sandy loam with slight ironstone gravel overlying a weakly structured reddish brown sandy clay on calcarenite within 50 cm - rises.
- **B7** <u>Shallow sand over sandy clay on calcrete (Petrocalcic, Brown Chromosol)</u> Medium thickness sand overlying brown friable sandy clay to clay on limestone or calcreted sandy clay within 50 cm - flats.
- **B7a** Sand over clay on calcrete (Petrocalcic, Brown / Red Chromosol) Medium to thick sand with a bleached A2 layer abruptly overlying a friable brown or red sandy clay loam to light clay on calcreted calcarenite at depths ranging from 40 cm to more than 100 cm.





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- **B7b** Loamy sand over brown sandy clay on calcrete (Lithocalcic, Brown Sodosol) Medium thickness loamy sand abruptly overlying a dark brown sandy clay on calcreted lagoonal sediments or rubbly calcrete at about 50 cm.
- B8Shallow sand on calcrete (Petrocalcic, Bleached-Leptic Tenosol)Thick bleached sand over calcreted calcarenite within 50 cm rises.
- D1 Loamy sand over clay (Eutrophic, Red Chromosol) Thick loamy sand abruptly overlying a well structured red clay grading to weathering granite within 100 cm.
- B9 Shallow clay loam over brown or dark clay on calcrete. (Clay loamy Petrocalcic Sodosol)
- Bleached sand over sandy clay loam (sandy Brown-Red Chromosol)
 Sandy texture contrast soil with a bleached A2 and a friable brown-red sandy clay loam to sandy loam subsoil.
- **G3** <u>Thick sand over clay (Hypercalcic, Brown Sodosol/ Chromosol)</u> Thick bleached sand with an organically darkened surface abruptly overlying a massive to coarsely structured brown to reddish yellow sandy clay to clay, calcareous with depth - rises.
- **G4** Sand over poorly structured clay (Sandy Brown-Red Sodosol-Chromosol) Topsoil <30 cm over a poorly structured subsoil. Thin sandy texture contrast soil with a sodic /dispersive /poorly structured brown or red clayey subsoil. Can have some ironstone.
- **G5** Sand over acidic clay (Sandy Brown Kurosol) Sandy texture contrast soil with a friable brown strongly acidic clayey to clay loamy subsoil. Very acidic soil; incipient Bh horizons; moderate depth topsoils. Some with ironstone.
- H3Deep bleached sand (Basic, Arenic, Bleached-Orthic Tenosol)Grey sand over a very thick bleached sand grading to yellow sand continuing below 100 cm.
- Highly leached sand (Fragic, Pipey, Aeric Podosol)
 Grey sand with a very thick bleached A2 layer, over dark brown and yellow massive soft to semi-hard clayey sand (coffee rock), grading to softer yellow and brown sand to sandy clay loam from about 80 cm.
- I2 <u>Wet highly leached sand (Fragic, Humic, Aquic Podosol)</u> Grey sand with a thick bleached A2 horizon, overlying a thin to thick layer of coffee rock, grading to pale brown sand sharply overlying a grey, brown and yellow mottled sandy clay loam to light clay.
- M4 <u>Deep hard gradational sandy loam (Hard Brown-Dark Kandosol- Dermosol)</u> Deep dark brown loamy to clay loamy soil grading to clay at depth. Hardsetting surface often with prismatic structures in the subsoil.
- N1 <u>Peat (Organosol)</u> Peaty soil.
- N2c Wet saline clay loam (Dermosolic, Salic Hydrosol) Medium thickness dark grey to black clay loam to clay grading to well-structured dark grey clay with minor carbonates and a water table within 100 cm.
- N3 Seasonally waterlogged, non to marginally saline equivalents of soils listed above, viz.: N3c Wet G3 N3d Wet B5 N3e Wet B7
- **RR** Bare rock.

Further information: DEWNR Soil and Land Program



