

KIA Kia-Ora Land System

Area: 315.0 km²

Landscape: Gently undulating pediments, plains and rises, weakly dissected by broad drainage lines trending north west to south east. Scalding and gullying are common.

Annual rainfall: 205 – 235 mm annual average.

Geology: Alluvial deposits ranging from Pleistocene calcareous rubbles and calcretes through Holocene to present day floodplain sediments, mostly sandy clay loams to clays.

Soils: Calcareous sandy loams to clay loams formed in alluvium or localized outwash deposits are predominant. Red loamy surfaced texture contrast soils are also common.

Main soils (on alluvium / outwash)

- A4** Deep (rubbly) calcareous sandy loam
- A3** Deep moderately calcareous loam to clay
- A6** Gradational calcareous clay loam to loam
- D4** Loam to clay loam over pedaric red clay

Minor soils

On alluvium / outwash

- A5** Rubbly calcareous sandy clay loam on clay
- C1** Gradational sandy loam
- M2** Deep friable gradational clay loam
- M4** Hard gradational sandy clay loam

On basement rock

- A2** Shallow calcareous loam
- L1** Shallow stony loam
- RR** Rock outcrop

Summary: The Kia-Ora Land System consists of weakly dissected, gently undulating pediment plains and rises with gradational calcareous soils and some red texture contrast soils. Scalding and gullying are common.

Soil Landscape Unit summary: 26 Soil Landscape Units (SLUs) mapped in the Kia-Ora Land System:

SLU	% of area	Component	Main soils	Prop#	Notes
AIH	0.1	Ridges	L1A2	D	Rolling rises formed on fine grained rock. Relief is 9-30m, slopes are 3-10%. More than 20% of land affected by gullying, and up to 5% is scalded. Main soils: <u>shallow stony loam - L1</u> and <u>shallow calcareous loam - A2</u> , with <u>rock outcrop - RR</u> .
AYA	0.4	Rises	A2	D	Undulating rises formed on fine grained rocks, especially siltstones of the Tapley Hill Formation. Relief is less than 30m, slopes are 3-10%. Main soils: <u>shallow calcareous loam - A2</u> and <u>shallow stony loam - L1</u> .
JLp	0.1	Flats	D4A3	D	Flats formed on medium grained alluvium. Scalding affects 10-50% of the land. Main soils: <u>sandy clay loam over pedaric red clay - D4</u> and <u>deep moderately calcareous loam - A3</u> , with <u>hard gradational sandy clay loam - M4</u> and <u>rubbly calcareous sandy clay loam on clay - A5</u> .



JMb	0.6	Fans	D4A3	V	Fans, plains and creek flats formed on fine grained outwash sediments with surface quartz gravel.
		Low rises	A4	L	
JMp	1.5	Flats	D4A3	D	JMb Gently sloping fans and low rises. 5-10% of fans are affected by gullyng. JMp Flats, more than 50% scalded. JMu Flats, more than 50% scalded and 10-20% affected by gullyng. JMv Gently sloping fans with slopes of 1-3%. More than 50% scalded and 10-20% affected by gullyng. Main soils: Fans and flats: <u>clay loam over pedaric red clay - D4</u> and <u>deep moderately calcareous clay loam - A3</u> . Rises: <u>deep (rubbly) calcareous sandy loam - A4</u> , with <u>deep moderately calcareous loam - A3</u> and <u>gradational calcareous loam - A6</u> .
JMu	0.1	Flats	D4A3	D	
JMv	0.4	Fans	D4A3	D	
JPE	0.6	Drainage depressions	D4	D	
JPU	0.5	Flats	D4	D	JPE Drainage depressions. JPU Flats, 10-50% scalded.
JPo	3.0	Drainage depressions	D4	D	
JPp	0.3	Plains	D4	D	JPo Drainage depressions. 10-20% affected by gullyng, 10-50% scalded. JPp Plains, more than 50% scalded. JPq Gently sloping fans, 1-3% slope. More than 50% scalded.
JPq	0.5	Fans	D4	D	
JPt	0.6	Drainage depressions	D4	D	JPt Drainage depressions. More than 50% scalded. JPu Flats and low rises. More than 50% of flats are scalded, and 10-20% affected by gullyng. JPy Drainage depressions. More than 50% scalded and more than 20% affected by gullyng. Main soils: Fans and flats: <u>sandy clay loam over pedaric red clay - D4</u> , with <u>deep moderately calcareous loam - A3</u> , <u>gradational calcareous clay loam - A6</u> , <u>hard gradational sandy clay loam - M4</u> and <u>gradational sandy loam - C1</u> . Rises: <u>deep (rubbly) calcareous sandy loam - A4</u> , with <u>deep moderately calcareous loam - A3</u> and <u>gradational calcareous loam - A6</u> .
JPu	1.7	Flats	D4	V	
JPy	3.4	Drainage depressions	D4	D	
		Low rises	A4	C	
KFL	7.3	Gently undulating plains	A4	V	Gently undulating plains and flats formed on medium grained alluvium. KFL Gently sloping low rises and flats, 1-3% slope. KFV Gently sloping fans, rises and flats, 1-3% slope. Flats are more than 50% scalded. KFI Gently sloping fans and drainage depressions, 1-3% slope. More than 50% scalded and 10-20% affected by gullyng. Main soils: Gently undulating plains: <u>deep (rubbly) calcareous sandy loam - A4</u> , with <u>deep moderately calcareous loam - A3</u> and <u>gradational calcareous loam - A6</u> . Flats: <u>gradational calcareous sandy clay loam - A6</u> , with <u>sandy clay loam over pedaric red clay - D4</u> , <u>deep moderately calcareous loam - A3</u> and <u>gradational sandy loam - C1</u> .
		Flats	A6	C	
KFV	33.6	Gently undulating plains	A4	V	
		Flats	A6	E	
KFI	17.8	Gently undulating plains	A4	V	
		Flats	A6	C	
KLB	21.8	Gently undulating plains	A4A3	V	Plains, fans and rises formed on medium grained alluvial deposits. KLB Gently undulating plains, 1-3% slope, with drainage depressions. KLC Undulating rises, 3-10% slope, with flats. KLb Fans, 1-3% slope with 5-10% eroded watercourses, and undulating rises, 3-10% slope and up to 30 m high. Main soils:
		Drainage depressions	D4	C	
KLC	0.6	Rises	A4	V	
		Flats	A3	C	
KLb	0.3	Fans	A4A3	V	



		Rises	A4A2	L	<p>Plains and fans: <u>deep (rubbly) calcareous sandy loam - A4</u> and <u>deep moderately calcareous loam - A3</u>, with <u>sandy clay loam over pedaric red clay - D4</u> and <u>gradational sandy loam - C1</u>.</p> <p>Depressions: <u>clay loam over pedaric red clay - D4</u>, with <u>deep moderately calcareous clay loam - A3</u>, <u>gradational calcareous clay loam - A6</u> and <u>gradational sandy loam - C1</u>.</p> <p>Rises: <u>deep (rubbly) calcareous sandy loam - A4</u>, with <u>shallow calcareous loam - A2</u>.</p> <p>Flats: <u>deep moderately calcareous sandy clay loam - A3</u>, with <u>gradational sandy loam - C1</u> and <u>sandy clay loam over pedaric red clay - D4</u>.</p>
KQm	0.2	Fans	A3A4	D	Fans formed on coarse grained outwash, slopes 3-10%. 10-50% scalded, and 5-10% affected by gullyng. Main soils: <u>deep moderately calcareous loam - A3</u> and <u>deep (rubbly) calcareous sandy loam - A4</u> , with <u>gradational sandy loam - C1</u> and <u>shallow calcareous loam - A2</u> .
KVA	0.3	Flats	A3	D	Rises and plains formed on calcareous outwash sediments derived from basement rock. KVA Flats. KVB Gently sloping rises and flats, 1-3% slope. KVV Gently undulating rises and flats, 1-3% slope. 10-50% scalded. Main soils: Rises: (rubbly) calcareous sandy loam - A4 and <u>deep moderately calcareous clay loam - A3</u> , with <u>gradational sandy clay loam - M4</u> and <u>sandy clay loam over pedaric red clay - D4</u> . Flats: <u>deep moderately calcareous clay loam - A3</u> , with <u>gradational calcareous clay loam - A6</u> and <u>clay loam over pedaric red clay - D4</u> .
KVB	1.7	Rises	A4A3	V	
		Flats	A3	C	
KVV	2.2	Rises	A4A3	V	
		Flats	A3	C	
XOA	0.4	Flats	A3	D	Floodplain flat, swampy and marginally saline, with clayey calcareous soils on alluvium. Up to 5% scalded. Main soils: <u>deep moderately calcareous clay - A3</u> , with <u>deep friable gradational clay loam - M2</u> .

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:

- A2** Shallow calcareous loam (Paralithic, Hypercalcic / Lithocalcic Calcarosol)
Calcareous stony loam grading to soft or rubbly carbonate over weathering dolomite or calc-siltstone within 50 cm.
- A3** Deep moderately calcareous loam to clay (Regolithic, Calcic Calcarosol)
Calcareous loam to light clay grading to a clay loamy to clayey subsoil without a significant carbonate accumulation in the subsoil, grading to medium to fine grained alluvium.
- A4** Deep (rubbly) calcareous sandy loam (Regolithic, Hypercalcic / Lithocalcic Calcarosol)
Calcareous sandy loam grading to a very highly calcareous sandy clay loam to light clay with variable rubble, continuing below 120 cm.
- A5** Rubbly calcareous sandy clay loam on clay (Regolithic, Hypercalcic / Lithocalcic Calcarosol)
Calcareous sandy clay loam grading to a very highly calcareous rubbly sandy clay loam to light clay, over a clayey substrate deeper than 60 cm, but within 120 cm.
- A6** Gradational calcareous clay loam to loam (Pedal, Hypercalcic / Supracalcic Calcarosol)
Calcareous loam to clay loam grading to a well structured very highly calcareous (sometimes rubbly) clay, over a red clayey substrate within 120 cm.
- C1** Gradational sandy loam (Hypercalcic, Red Kandosol)
Friable sandy to loamy topsoil grading to massive red-brown alkaline loamy to clay loamy subsoil, highly calcareous with depth, over alluvium.
- D4** Loam to clay loam over red friable clay (Calcic, Pedaric, Red Sodosol)
Thin to medium thickness loam to clay loam over a finely structured friable red clay, calcareous from about 50 cm, grading to fine or medium grained alluvium.
- L1** Shallow stony loam (Paralithic, Leptic Tenosol)
Shallow stony loam, often calcareous with depth, overlying weathering fine grained rock shallower than 50 cm.
- M2** Deep friable gradational clay loam (Calcic, Red / Brown Dermosol)
Friable loam to light clay grading to a well structured red or brown dark clay, calcareous with depth, over alluvium.
- M4** Hard gradational sandy clay loam (Calcic, Brown / Red Dermosol / Kandosol)
Hard setting sandy loam to sandy clay loam grading to a poorly structured to massive hard red or brown sandy clay to clay, weakly to moderately calcareous with depth, over alluvial sediments.
- RR** Rock outcrop

Further information: [DEWNR Soil and Land Program](#)

