

ERI Erith Land System

Very gently undulating plains between Balaklava and Owen

Area: 101.9 km²

Annual rainfall: 360 – 405 mm average

Geology: The land system is underlain by coarsely structured red and grey mottled heavy Hindmarsh Clay. A veneer of highly calcareous Woorinen Formation material overlies the clay. This varies in form from finely divided soft masses of carbonate in a clay loam or clay matrix, through rubbly Class III B or III C forms to Class II sheet calcrete, depending on degree of exposure. Thickest accumulations of Woorinen materials are on rises where they are often accompanied by abundant surface stone. There are also small areas of Molineaux Sand deposits, occurring as low sand hills. These overlie the Woorinen carbonates.

Topography: The Erith Land System is a very gently undulating plain with an overall gradient to the west of less than 1%. The larger part of the plains is a mosaic of about 80% flats and depressions and 20% very low stony rises. There are significant areas of mainly low rises where the ratio of flats to rises is reversed. In the east there is a small dunefield of very low relief. There is almost no surface drainage, minor exceptions being on the low stony rises.

Elevation: 90 m in the east to 45 m in the south-west

Relief: Less than 10 m

Soils: The main soils are deep calcareous loams, commonly rubbly. Shallow variants, along with deep sands and sandy loam over clay soils make up the rest.

Main soils

- A6** Calcareous loam - extensive (flats and swales)
- A4** Calcareous rubbly loam – common (rises), limited (flats and swales)
- B3** Shallow sandy loam over calcrete - limited (stony flats)

Minor soils

- B2** Shallow calcareous sandy loam - stony rises
- D2** Sandy loam over red sandy clay - rises and flats
- H2** Deep sand - sand rises

Main features: The Erith Land System is flat to very gently undulating and fully arable. The soils are predominantly calcareous throughout, variations being mainly due to the nature of subsurface carbonate layers which are either soft, rubbly or occasionally occur as sheet rock. Moisture holding capacity is a limitation on the rubbly soils. Otherwise, lime induced nutrient deficiencies, and restricted crop options are the main consequences of the high soil carbonate status. Very high pH and high levels of boron and sodium in the carbonate layers impact on productivity, particularly in drier seasons. These conditions are caused by restrictions on leaching by the substrate clay, which generally occurs within a metre of the surface. There are minor areas of sand hills with associated fertility and wind erosion problems.



Soil Landscape Unit summary: 3 Soil Landscape Units (SLUs) mapped in the Erith Land System:

SLU	% of area	Main features #
IEA	73.0	<p>Very gently undulating plains underlain by Hindmarsh Clay. The landscape consists of about 80% flats and depressions and 20% very low rises with up to 10% surface calcrete stone.</p> <p>Main soils: <u>calcareous loam</u> - A6 (V) mainly on flats and <u>calcareous rubbly loam</u> - A4 (C) mainly on rises, with <u>sandy loam over red sandy clay</u> - D2 (M) on rises and <u>shallow sandy loam over calcrete</u> - B3 (M) on stony flats. This land is mostly arable, although some soils, mainly on the low rises, are very rubbly with restricted waterholding capacity. Virtually all soils are calcareous throughout with consequent implications for nutrient fixation and crop options; but soil structural problems are unlikely. Boron levels are likely to be toxic within potential rootzone depths due to the presence of Hindmarsh Clay within a metre. Very high pH and sodium levels can also be expected in the Class I carbonate layer.</p>
SdA	23.2	<p>Low very gently undulating rises with variable surface calcrete stone coverage, up to 20%. There are about 20% depressions and 5-10% very low sand hills.</p> <p>Main soils: <u>calcareous rubbly loam</u> - A4 (E), <u>shallow calcareous sandy loam over calcrete</u> - B2 (C) and <u>shallow sandy loam over calcrete</u> - B3 (C), with <u>calcareous loam</u> - A6 (L) in depressions and <u>deep sand</u> - H2 (M) on sand hills. These soils are mainly shallow and / or stony with consequent reductions in waterholding capacity. All soils are well structured with no physical restrictions to root growth except where the carbonate has hardened to sheet form. Most are alkaline throughout with rubble at shallow depth indicating likely nutrient fixation problems, reduced cropping options and possible herbicide persistence.</p>
UFJ	3.8	<p>Dune-swale systems with 30-60% coverage of low sand hills. The sand hills overlie the older Hindmarsh Clay and Woorinen Formation landscapes of IEA.</p> <p>Main soils: <u>calcareous rubbly loam</u> - A4 (C) and <u>calcareous loam</u> - A6 (C), with <u>sandy loam over red sandy clay</u> - D2 (L) in swales and on lower slopes, and <u>deep sand</u> - H2 (E) on sand hills. The dunes, although mostly arable, are nevertheless difficult to manage due to the low fertility status of the soils and the constant risk of wind erosion. The soils of the swales are potentially more productive, but the rubbly forms are subject to moisture deficit in spring. The main difficulty lies in managing the system as a whole, a problem made more difficult because property and paddock boundaries generally are not parallel to dune systems.</p>

PROPORTION codes assigned to soils within Soil Landscape Units (SLU):

- (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:

- A4** Calcareous rubbly loam (Regolithic, Supracalcic / Lithocalcic Calcarosol)
10 - 20 cm calcareous sandy loam to loam becoming more calcareous with depth over a rubbly Class III B or III C carbonate at 30 cm grading to a very highly calcareous slightly rubbly fine sandy clay loam (Class III A carbonate) over a red coarsely structured clay as shallow as 80 cm, but usually deeper than 100 cm.
- A6** Calcareous loam (Pedal / Regolithic, Hypercalcic Calcarosol)
10 - 20 cm calcareous loam to clay loam grading to a very highly calcareous brown clay loam to light clay with abundant Class I carbonate from 35 cm merging with a red coarsely structured clay at 100 cm.
- B2** Shallow calcareous sandy loam over calcrete (Petrocalcic Calcarosol)
5 - 15 cm calcareous sandy loam grading to Class III B or III C rubble over sheet calcrete at 35 cm.
- B3** Shallow sandy loam over calcrete (Petrocalcic, Red Kandosol)
10 - 20 cm sandy loam over a red massive sandy clay loam with rubbly carbonate at about 25 cm over calcrete at 35 cm.
- D2** Sandy loam over red sandy clay (Supracalcic, Red Chromosol)
10 - 15 cm soft sandy loam abruptly overlying a red sandy clay loam to sandy clay with a Class III B rubble layer from 30 cm grading to red substrate clay from about 100 cm.
- H2** Deep sand (Calcareous, Arenic, Red-Orthic Tenosol)
25 - 50 cm non calcareous red sand grading to a calcareous sand over a highly calcareous clayey sand to sandy clay loam from 65 cm.

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

