SIMS FARM

a Research Centre for Eastern Eyre Peninsula

Foreword

It has been one of the long term aims of the Department of Agriculture to develop the Sims Bequest Farm at Cleve as a research centre to serve the research needs of Eastern Eyre Peninsula.

Already, one very significant project has been established on the centre. This is a water conservation study to improve run-off from dam catchment areas. The study's importance to the region can hardly be over-estimated, as stock water supplies always have been a problem on Eyre Peninsula and may well be the limiting factor to sheep and cattle production in the future.

With limited staff resources at the moment, the farm will be used initially to complement the beef cattle production studies for the cereal zone. These studies are being developed at Minnipa Research Centre.

However, the main reason for publishing this article is to give the reader a clear example of the Department's activities in the fields of soil mapping and farm planning for more efficient land use and subdivision.

Similar planning, but on a much larger scale is also being done for the development of the new city of Monarto, and for the future development of 30 000 hectares of agricultural land at Padthaway.

(Marshall R. Irving)
Director of Agriculture

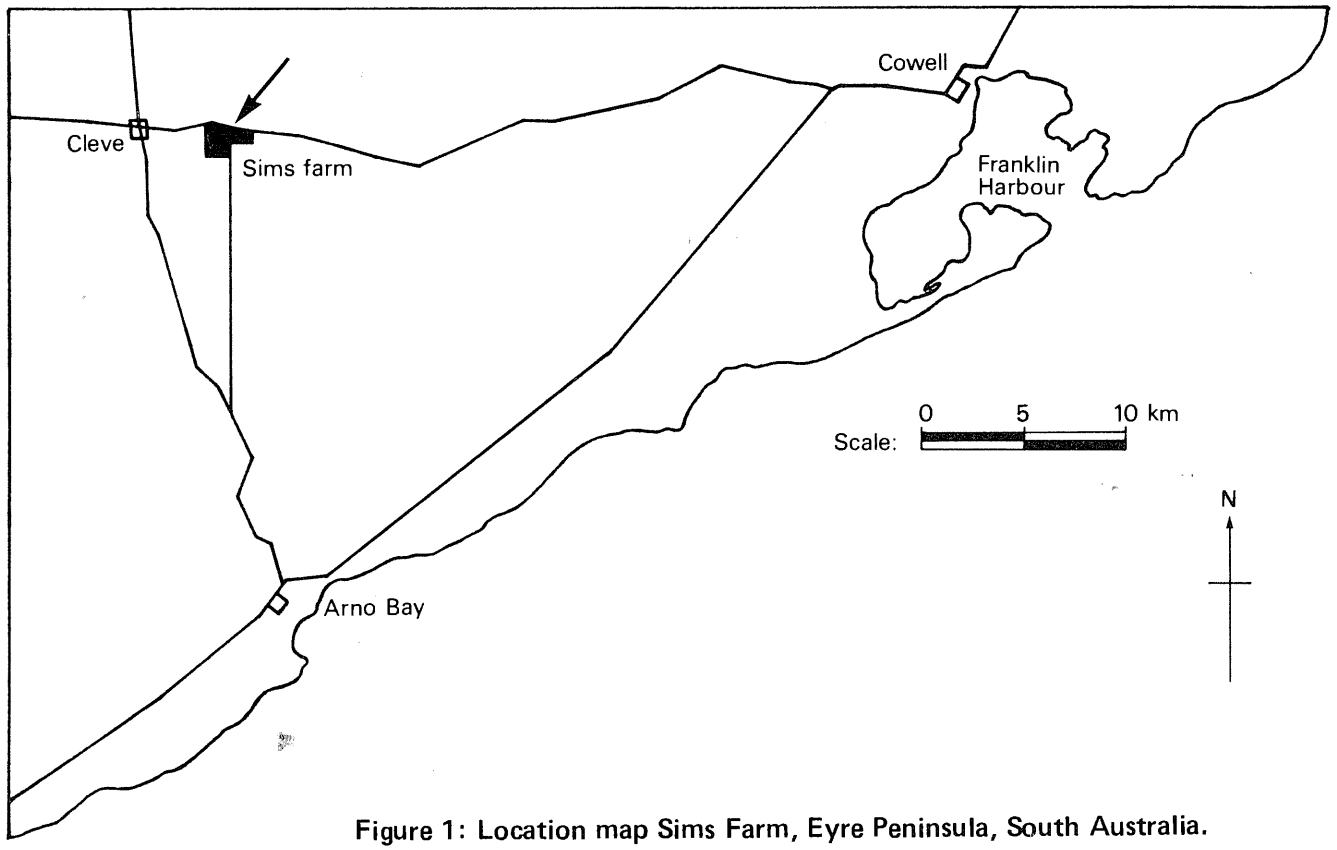

Figure 1: Location map Sims Farm, Eyre Peninsula, South Australia.

W.J. Davies, Soil Conservation Officer
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Sims Farm is named after Mr. C.L.G. Sims late of Cleve, South Australia. On his death in 1960, Mr. Sims bequeathed his farm, Sections 44, 45, 120, Hundred of Mann in County Jervois, Eyre Peninsula, to the South Australian Government for use as an Agricultural Research Farm.

Up to 1973, the Department of Agriculture leased the farm to local farmers, although cereal variety and other trials have been carried out by the Department on Sims Farm since 1961.

Early in 1973 the Director of Agriculture authorised the further development of the farm as a research centre. A necessary requirement included preparation of a statement on the resources of the farm to assist in planning future development.

General description of the land

Sims Farm covers an area of 405 ha at the foot of the southern slope of the Cleve Hills. It is 5 km east of Cleve township (Figure 1).

The main features of the farm are:

- The Yeldulkinie and Poonana creeks; two ephemeral streams which flow from the Cleve Hills, converge in the centre of the farm and run out the south-western corner.

- A high ridge runs from the north-eastern corner to the centre of the farm where it meets the creek. The ridge dips sharply to a long low-lying plain at the southern end of the farm.

The farm comprises three distinct land units (Figure 2), each of which has one or two readily identifiable sub-units.

1. Ridge unit:

Sub-units –

a. Flats and lower slopes.
b. The ridge and associated knobs and rises.

2. Creek unit:

Sub-units –

a. Creek bed and low lying terraces.
b. Higher terraces.

3. Plain unit:

Sub-unit –

a. Flat to very gently undulating plain.

The units are described in detail later.

Climate

The climate at Cleve is typically Mediterranean, mainly winter rainfall with hot, dry summers. Heavy summer rain falls in some seasons. The average annual rainfall is 397 mm and the effective rainfall season is 5.8 months (May-October).

Summer storms can cause water erosion on cereal land. The probability of storm intensities is shown in Table 1.

Table 1: Probability, duration and intensity of storms at Cleve.

Probability	Storm duration	Intensity
Annual	5 minutes	38 mm/h
10 year	5 minutes	84.5 mm/h

Average temperatures are as follows:

Mean monthly maximum: 27.7°C
Mean monthly minimum: 6.7°C.

In January, the evaporation can be as high as 272 mm. The average annual evaporation is 1780 mm.

Geology

Sim's Farm lies on the southern edge of the Cleve Hills. These consist of a series of extremely old (pre-Cambrian) rocks.

The uppermost group are glittering layered rocks (micaceous schists) up to 1 500 m thick. A ridge of this material dissects Sims Farm; it is up to 12 m above the surrounding terrain in some places.

Surface rock on the ridge consists mainly of shiny grey stone (quartzite), sometimes with a thin iron coating. Flat elongated quartz rocks are often found throughout the soil profiles.

Thick layers of soft limestone rubble are found on the lower slopes of the farm.

For further reading about the area

Johns, R.K. (1961) – Geology and mineral resources of southern Eyre Peninsula. Bull. Geol. Surv., S. Aust., 37.

Northcote, K.H. (1971) – A factual key for the recognition of Australian soils. 3rd edition, Rellim Press, Adelaide, S. Aust.

Parkin, L.W. (editor), (1969) – Handbook of South Australian Geology. Govt. Printer, S. Aust.

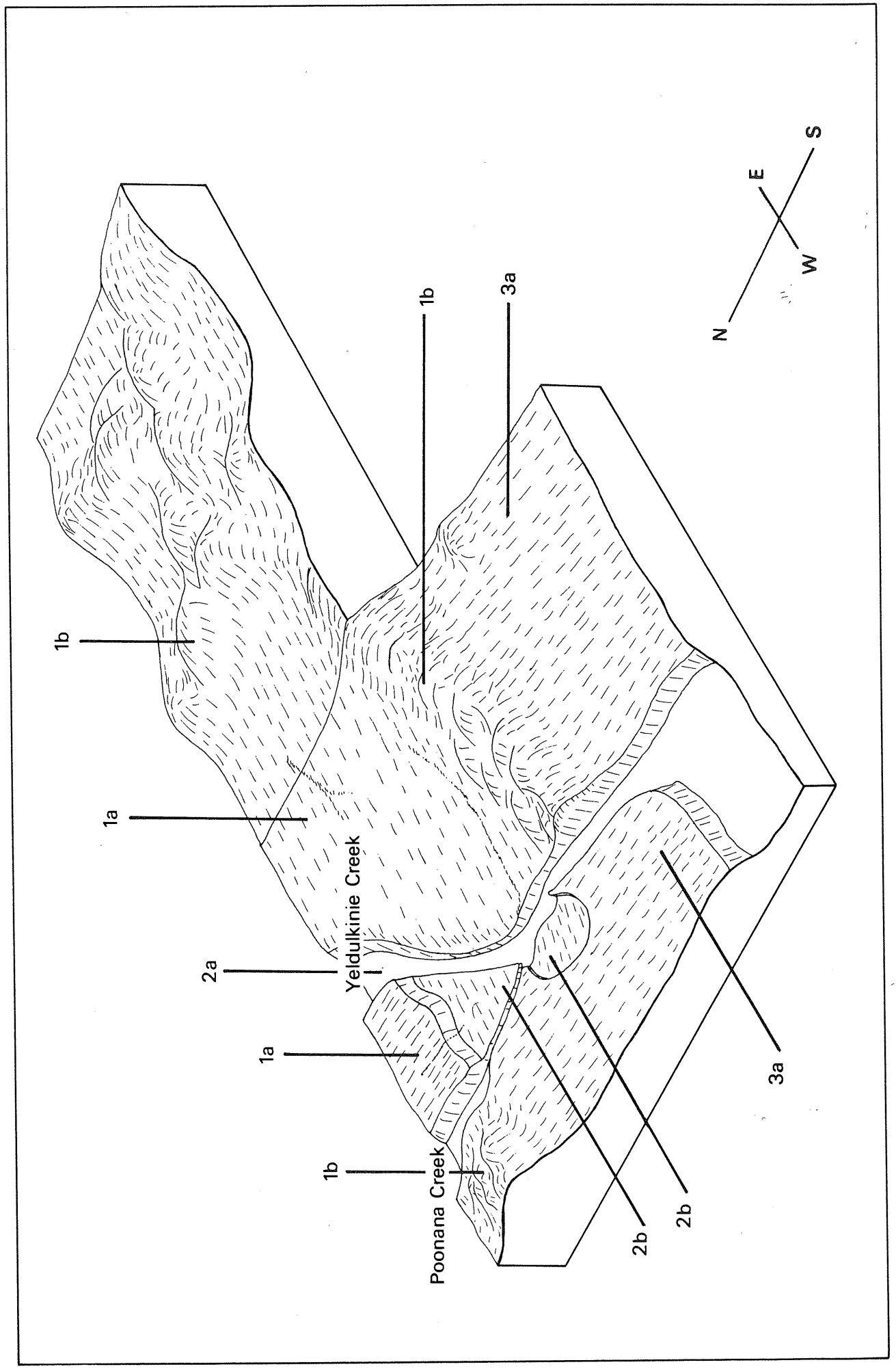


Figure 2: Representative block diagram of Sims Farm, showing land units, sub-units (e.g. 1a, 1b).

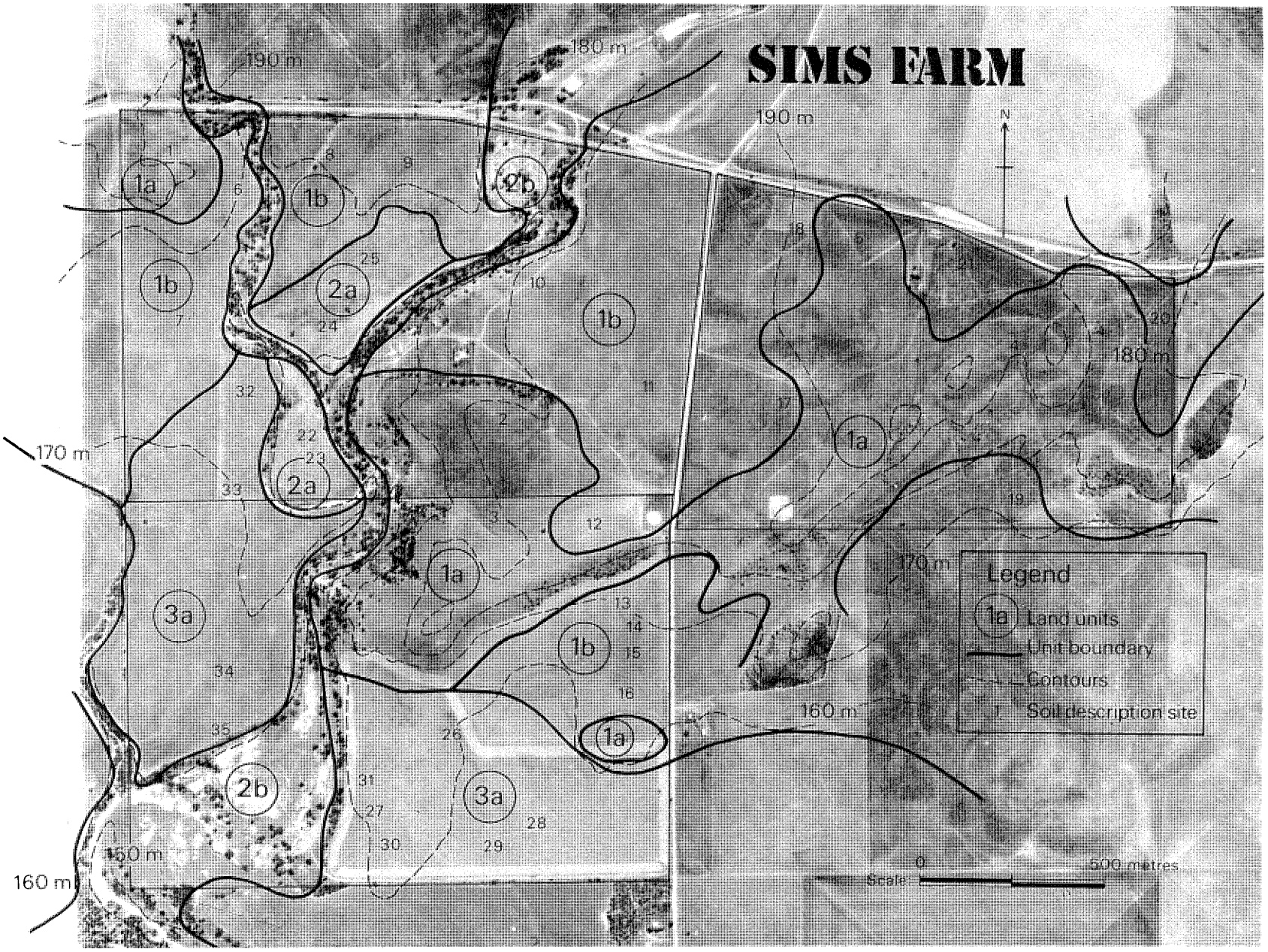


Figure 3: Ground plan of Sims Farm showing land units, contours and soil description sites.

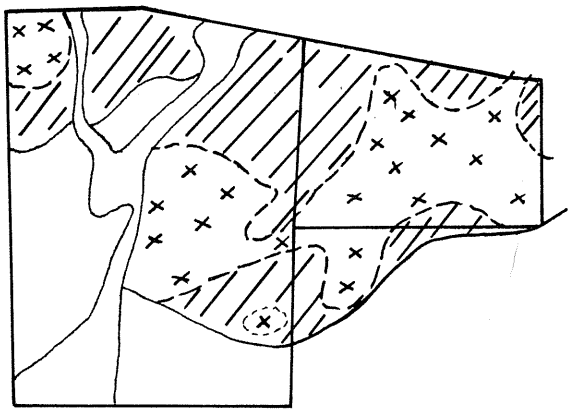
1. Ridge unit

Sub-unit description

Sub-unit	Form	Soil description	Land use comments
a.	Lower slopes and flats. Minor water courses cross the sub-unit. Area 140 ha	Sandy clay loam over sandy medium clay. †Dr 2.13 (*40 cm) Loamy sand over coarse loamy sand – clay sand over coarse sandy clay – medium clay. Dr 2.23 (*50 cm) (profiles 6-21, see map)	Generally productive but drainage a problem in some areas. Good agricultural soil.
b.	Ridge and associated rises and knobs. Area 110 ha	Shallow stony soil. Sandy loam – silty loam over clay loam. Uc 5.11, Um 5.11, Gc 1.11. (*10-15 cm) Stony soil with silty loam over medium clay. Dr 2.22 (*25 cm) (profiles 1-5, see map)	Soil depth and slope limit cultivation. Poor moisture storage. Generally productive soil, limited only by stone and slope.

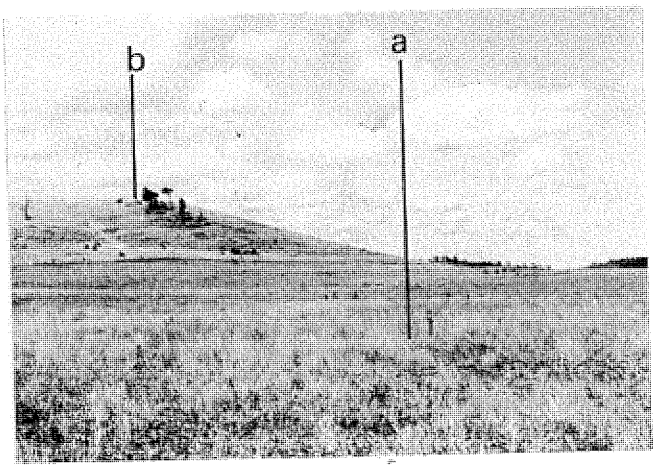
*Depth = to bedrock or lime layer. †This code refers to Northcote's Soil Classification System (Northcote, 1971).

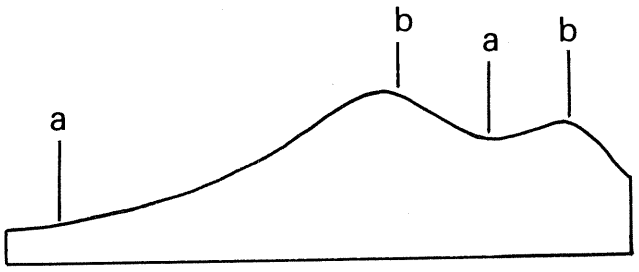
Unit 1 - Location diagram



Sub-unit a

Sub-unit b





Unit 1 - Representative cross-sectional diagram

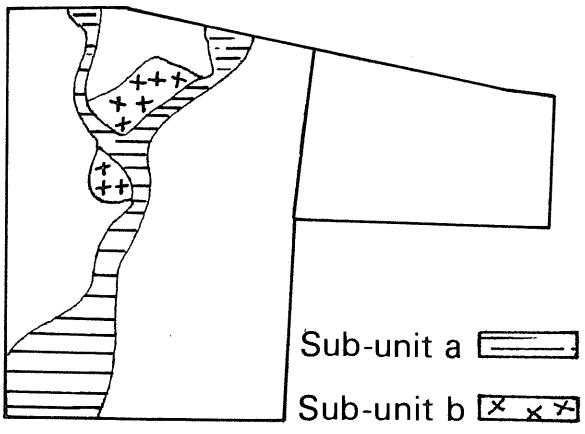
2. Creek unit

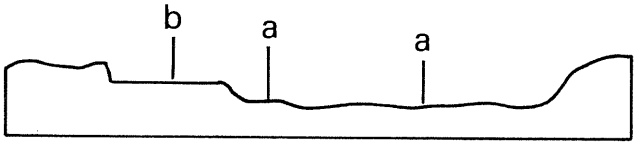
Sub-unit description

Sub-unit	Form	Soil description	Land use comments
a.	Creek bed and small terraces. Area 40 ha	Deep alluvial soils. Generally thick gravel beds overlain by coarse sand and silts. Rounded rocks and boulders through profile.	Suitable only for grazing. Frequently eroded by creek water.
b.	Elevated creek terraces. Flat to gently undulating. Area 17 ha	**Terrace west of main creek.** Deep coarse loamy sand, rich in carbonate. Rounded pebbles and rock below 30 cm. Uc 1.13 (*55 cm) (profiles 22, 23, see map)	Poor soil moisture retention.
		Terrace between the 2 creeks. Deep soil with fine sandy loam over coarse sandy loam over sandy clay. Some rounded rocks and pebbles through profile. Dr 2.23 (*75 cm) (profiles 24, 25, see map)	Good agricultural soil.

*Depth = to bedrock or lime layer.

Unit 2 - Location diagram





Unit 2 - Representative cross-sectional diagram

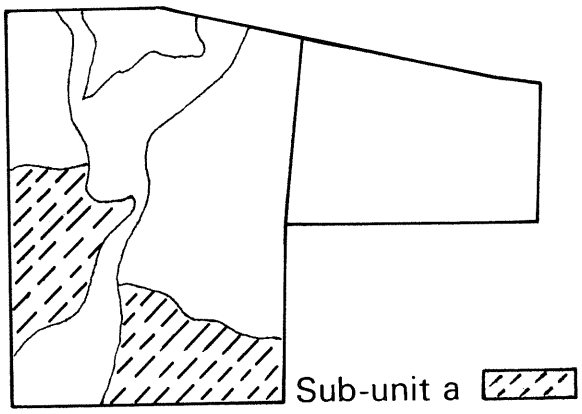
3. Plain unit

Sub-unit description

Sub-unit	Form	Soil description	Land use comment
a.	Flat to very gently undulating with an overall gentle slope to the south. Area 80 ha	**Land east of creek.** Gritty loamy sand over sandy clay loam. Dr 2.13 (*25-40 cm) Deep limy soils with sandy loam over light limy clay. Limestone gravel through profile. Dr 2.12 (profiles 26-31, see map) **Land west of creek.** Deep soil, calcareous throughout, grading from a sandy loam to sandy clay loam to light limy clay with much limestone gravel. Gc 1.11, Gc 1.12, Dr 2.13 (profiles 32-35, see map)	Subject to wind erosion. Moisture retention low. Generally productive soils. Some risk of wind erosion. As above.

*Depth = to bedrock or lime layer.

Unit 3 - Location diagram



We are metric

This is the first metric issue of the Journal.

In this and future issues all distances, areas, quantities, etc. will be given in metric units. To help readers adjust to the change, some conversion factors for everyday metric units are given inside the back cover.