GOS Gosse Land System

A plateau surface area, much of which is poorly drained. The western part of the central Kangaroo Island plateau surface. This land system named after the locality of Gosse which is situated near the eastern edge of the system.

Area: 122.7 km^2

Annual rainfall: 710 – 820 mm average

Geology: The system is mostly underlain by deeply weathered mottled clays. These clays are often overlain with ironstone gravel or ferricrete (Pliocene age ferricrete regolith). Early Cambrian age Kanmantoo Group meta-sandstones occur at depth. In many wetter areas the ironstone has 'dissolved' and is no longer evident.

Topography: Mostly remnant plateau surfaces. Slopes are typically 0 to 3%. Many low lying wetter areas occur. These range from flats and slight depression on the plateau surface which are poorly drained, to sluggishly drained drainage depressions and lagoonal depressions. Only a few sluggishly drained upper drainage depressions are included in this system. This area is a watershed. Watercourses to the north drain to the northeast, north and northwest, while watercourses to the south drain to the south and southwest.

Elevation: Elevation varies from about 240 m to 300 m in the central west of the system

Relief: Relief is typically around 10 m

Soils:

F1-**G5**-**M1**	Sandy loam to loamy sand over acidic brown clay
J2a	Colluvial ironstone soil
J2b	Ironstone soil
J3	Shallow soil on ferricrete
I1-**I2**	Highly leached sand

Main features: Arable to semi-arable plateau surfaces. Topsoils are range from sandy to loamy. The majority of soils are underlain by a relatively impermeable clayey subsoil or substrate. These impermeable clays limit infiltration and drainage, and combined with the level topography and high rainfall result in much wetness and waterlogging. Sandy soils are typically highly leached and infertile. Where ironstone occurs it limits fertility by 'fixing' phosphorous. Soils underlain by ferricrete are limited by stoniness and low water holding capacities. Many soils are strongly acidic, and can have aluminium levels, which are toxic to plants: topsoils are often marginally toxic and lower subsoils are often highly toxic.

Soil Landscape Unit summary: Gosse Land System (GOS)

SLU	% of area	Main features #
FXB FXBw FXZ FXZw	0.8 0.3 16.8 13.0	Plateau surfaces dominated by ironstone soils: many formed on ferricrete. Main soils: **J2**b-**J2**a ironstone soil (*Ferric Brown Kurosol*), colluvial in lower lying situations. And extensive to common areas of **J3** shallow sandy loams on ferricrete (*Petroferric Tenosol*). '**FXB'** areas may have some soils with weathered rock at less than one metre. Some soils without ironstone gravel (**F1**-**G5**, or even **I1**-**I2**) occur in slight depression areas, especially in the west of the system.

		FXB – slightly sloping land (slopes 1-2.5%, 2-1e, 3-4w) **FXBw** – wetter slightly sloping land (slopes 1-3%, 2-1e, 4w) **FXZ** – slightly elevated plateau surface (slopes 0-2%, 1-2e, 3-4w) **FXZw** – wetter, generally lower lying plateau surface (slopes 0-1.5%, 1-2e, 4w) Summary: soils with ironstone gravel: many shallow on ferricrete. The dominant native species is usually a low mallee habit eucalypt or stringy bark.
FuB FuZ FuZw	0.8 2.5 1.2	Plateau surfaces dominated by ironstone soils formed on ferricrete. Main soils: **J3** shallow sandy loams on ferricrete (*Petroferric Tenosol*). With minor to common areas of **J2**a-**J2**b ironstone soil (*Ferric Brown Kurosol*). **FuB** – slightly sloping land (slopes 1-2%, 2-1e, 3-4w) **FuZ** – slightly elevated plateau surface (slopes 0-2%, 1-2e, 3-4w) **FuZw** – lower lying plateau surface (slopes 0-1%, 1e, 4w) Summary: shallow soils on ferricrete: with ferricrete fragments strewn across land surface. The native vegetation is usually dominated by stringy barks.
FvZw	10.5	Plateau surfaces with ironstone soils. Main soils: **J2**a colluvial ironstone soil (*Ferric Brown Kurosol-Kandosol*), and **J3** shallow soils on ferricrete (*Petroferric Tenosol*). With minor to limited areas of **F1**-**M1**-**G5** sandy loams to sands over clay (*Brown Kurosol-Kandosol*) and **I1**-**I2** highly leached sands on clay (*Podosol*) in lows. Summary: somewhat low lying and poorly drained plateau areas with shallow soils on ferricrete, and other soils, mostly with ironstone gravel. Stringy barks or sometimes mallee habit eucalypts dominate the native vegetation on ironstone areas; banksias dominate on sandy soils.
FtZ FtZw	8.5 4.1	Plateau surfaces with mostly sandy ironstone soils. Main soils: **J2**b-**J2**a sandy ironstone soil, colluvial in low lying areas (*Ferric Brown Kurosol-Kandosol*), and **J3** shallow sands on ferricrete (*Petroferric Tenosol*). With minor to common areas of **G5**-**F1** sands to sandy loams over clay (*Brown Kurosol*) and **I1**-**I2** highly leached sands on clay (*Podosol*) in lows of low lying areas. **FtZ** – slightly elevated plateau surface (slopes 0-2%, 1-2e, 3-4w) **FtZw** – somewhat low lying plateau surface (slopes 0-1%, 1e, 4-5w) Summary: areas with shallow sands on ferricrete, and other soils, mostly sandy with ironstone gravel: often low lying and poorly drained. Native vegetation is often dominated by banksia shrubs.
PeA PeZ	10.2 0.6	Sandy plateau surfaces. Main soils: **F1**-**G5** sandy loams to sands over clay (*Brown Kurosol*). With **I1**-**I2** highly leached sands on clay often with ironstone (*Podosol*); and slightly elevated patches/strips of **J2**a-**J2**b ironstone soil usually colluvial (*Ferric Brown Kurosol-Kandosol*) and **J3** shallow soils on ferricrete (*Petroferric Tenosol*). **PeA** – low lying plateau surfaces (slopes 0-1.5%, 1e, 5-4w) **PeZ** – slighly raised plateau surfaces (slopes 0-1%, 1e, 4-3w). This includes a very low lunette-like area adjacent to a lagoonal depression. Summary: wet and infertile plateau surfaces. Native vegetation is usually dominated by banksia shrubs.
PiA PiZ	1.6 9.3	Sandy plateau surfaces. Main soils: **I1**-**I2** highly leached sands (*Podosol*), overlying ironstone gravel then clay, or just clay. And colluvial **J2**a ironstone soils (*Ferric Brown Kurosol-Kandosol*); **J3** shallow soils on ferricrete (*Petroferric Tenosol*); and **G5**-**F1** sands to sandy loams over clay (*Brown Kurosol*). **PiA** – low lying plateau areas (slopes 0-1%, 1e, 5w) **PiZ** – plateau surfaces (slopes 0-1.5%, 1e, 4w) Summary: sandy, wet and infertile. Native vegetation is usually dominated by banksia shrubs.

PoA PoE	0.3 7.0	Very shallow depressions on the plateau surface and other lower lying plateau surface areas. Main soils: **F1**, with some **M1**, thick sandy loams over clay (*Brown Kurosol-Kandosol*); and some **J2**a colluvial ironstone soils (*Ferric Brown Kurosol-Kandosol*). **PoA** – lower lying plateau surface areas (slopes 0-2%, 1-2e, 4w) **PoE** – very shallow depressions (slopes <1%, 1e, 4w) Summary: relatively fertile, poorly to imperfectly drained very shallow depressions. These are intermediate areas between wet depressions and ironstone rises. Deeper and more fertile soils occur on these patches than on adjacent ironstone areas (**F**** land units). And these patches are not as wet as adjacent swampy depression areas (**X**** land units). Native vegetation is usually dominated by relatively tall and upright stringy barks.
XUC XUU	7.7 0.4	Swampy depressions mostly with loamy to sandy soils. Main soils: **F1** with some **G5**-**M1** loams, sandy loams and loamy sands over clay loam or light clay (*Brown Kurosol-Kandosol*), often with ironstone gravel (**J2**a colluvial ironstone soil: *Ferric Brown Kurosol-Kandosol*), or overlying ferricrete often at shallow depth (**J3** shallow loam over ferricrete: *Petroferric Tenosol*). With **I1**-**I2** highly leached sands (*Podosol*). **XUC** – swampy shallow depression/drainage area/headwater area (slopes 0-1.5%, 1e, 5w). Very close to a '**PiA'** land unit. **XUU** – swampy upper drainage depressions usually with drainage lines (slopes 1-2.5%, 2e, 5w, 2-1g) Summary: wet and poorly drained depressions.
Xu- XuU XuUg	0.3 1.2 2.5	Swampy depressions with highly leached sands and other soils. Main soils: **I2** highly leached sands over clay (*Podosols*), and **F1**-**G5**-**M1** loams to sands over clay (*Brown Kurosol-Sodosol-Kandosol*). Often with some **J2**a colluvial ironstone soils and **J3** shallow soils on ferricrete. **Xu-** – small and shallow swampy depressions (slopes ~0%, 1e, 7w) **XuU** – swampy upper drainage depression area/headwater (slopes 0-1.5%, 1-2e, 7-5w) **XuUg** – swampy upper drainage depression with drainage lines (slopes 0-3%, 2-3e, 7-5w, 2-1g) Summary: wet and very poorly drained depressions.
XnC	0.5	Lagoonal depressions. Main soils: **N3** (wetter variant of **F1**-**G5**) wet texture contrast soil (Sodosolic Hydrosol) **XnC** – lagoonal depressions (7w). Kangaroo Lagoon, Archway (or Burgess) Lagoon, etc. Summary: wet and very poorly drained. Seasonally flooded.

Classes in the 'Soil Landscape Unit summary' table (eg. 2-1e, 3w, 2y, etc) describe the predominant soil and land conditions, and their range, found in Soil Landscape Units. The number '1' reflects minimal limitation, while increasing numbers reflect increasing limitation. Letters correspond to the type of attribute:

a - wind erosion	e - water erosion	f - flooding	g - gullying
r - surface rockiness	s - salinity	w - waterlogging	y - exposure

Detailed soil profile descriptions:

Soils:

F1-**G5**-**M1** Sandy loam to loamy sand over acidic brown clay (*Brown Kurosol-Kandosol*). Thick to very thick sandy loam, or sometimes loamy sand topsoil, overlying a pale yellow, light olive-grey or olive-yellow sandy clay loam, which is underlain by similar coloured clay at depth with red and yellow-brown mottles. Subsurface layers and even subsoil layers are often bleached. Ironstone nodules, or sometimes small quartz fragments, can occur in a soil layer. Subsoils are sometimes dispersive. Soil pHs are typically strongly acidic. Found in wet low lying situations, for example, on wet flats or depressions on the plateau surface or in sluggishly drained drainage depressions.

J2a Colluvial ironstone soil (*Ferric Brown Kurosol-Kandosol*). Usually light sandy loams overlying olive, yellow or yellow-brown sandy clay loam with ironstone gravel, which is underlain by mottled clay at depth. Topsoil thickness varies from thin to very thick, but is usually in the very thick range. Bleached layers can occur in the topsoil and subsoil. Soil pHs are typically strongly acidic. Subsoils are sometimes dispersive. Found in wet low lying flats and slight depression on the plateau surface. This soil is very similar to that above, however, it contains ironstone gravel and is usually not in as wet situations.

J2b Ironstone soil (*Ferric Brown Kurosol*). Thick sandy loam, or sometimes loamy sand, overlying yellow-brown, olive-yellow or yellow sandy clay loam to light clay, which is sometimes underlain by an olive-grey mottled clay lower subsoil, below which is a light grey clayey substrate with red, yellow-brown and/or brown mottles. Ironstone gravel occurs in the topsoil and the sandy clay loam/light clay layer below this. A ferricrete layer can occur below 50cm. Some small quartz fragments may also occur. Sandy clay loam/light clay subsoil layers can be bleached. Soil pHs are strongly acidic to acidic, with the most acidic layer usually being the light grey clayey substrate. Found on slight rises and flats on the plateau surface.

J3 Shallow soil on ferricrete (*Petrocalcic Tenosol*). Sandy loam, loam, or loamy sand, with or without ironstone gravel, overlying ferricrete at shallow depth. Bleached subsurface layers are typical of sandy variants. Soil pHs are strongly acidic to acidic. Found on slight rises and flats on the plateau surface.

I1-**I2** Highly leached sand (*Podosol*). Thick to very thick loamy sand or sandy loam topsoils, usually with a bleached subsurface layer, overlying a layer of dark brown fine sandy loam, sandy loam, fine loamy sand or fine light sandy clay loam with firm accumulations of iron-aluminium-organic compounds which may be in the form of a continuous pan. Another bleached layer can directly underlie this. Below this can be ironstone gravel, ferricrete or mottled clay. Soil pHs are strongly acidic. Found on wet flats, depressions, and drainage depressions on the plateau surface.

Further information: DEWNR Soil and Land Program