CYE Cygnet Escarpment Land System

An escarpment consisting of slopes and gullies. This escarpment is bordered by upland plateau areas to the south, and lowland plains to the north. The western edge of this escarpment is bordered by a saline drainage depression. The system is named after and overlies the eastern part of the Cygnet fault line.

Area: 24.6 km^2

Annual rainfall: 490 – 550 mm average

Geology: Most of the system is underlain by middle Cambrian age Kanmantoo Group meta-sediments, comprising fine to medium grained grey quartz phyllonite and phyllite. These foliated rocks have finer grains, and are somewhat softer and more easily weathered than the ubiquitous and older Kangaroo Island Kanmantoo Group meta-sandstones. Areas of near surface to surface exposure of these rocks are common throughout this system. Some areas of early Cambrian age Kanmantoo Group Tapanappa Formation meta-sandstones occur. Areas of Permo-Carboniferous age clayey glacial deposits occur, especially in the central part of the system where the escarpment is cut by a drainage depression: in these areas thick sands overlie unconsolidated clay.

Topography: Undulating to rolling low hills, with some undulating rise areas, in the form of an east-west running escarpment. Many creek gullies run northward down the escarpment slope to the plains below. Slopes typically range from 3 to 10%. Gully slopes reach up to 20%.

Elevation: From just over 10m at some lower slopes to near 90m at the plateau edge in the central part of the system.

Relief: Typically between 30 m and 40 m. Between 20 m and 30 m in places

Major Soils:

K3-**D7**-**K4**	Stony texture contrast soil
J2-**J1**-**F2**	Texture contrast soil mostly with ironstone gravel

Minor Soils:

L1	Rocky soil
G3-**G4**	Sand over sodic clay

Main Features: Arable, semi-arable and non-arable areas. Topsoils are mostly sandy loam. The main soils are stony to non-stony sandy loams over sodic clay. The rockiness and shallow nature of many of the soils are impediments to root growth and water holding capacity, and limit management options. The steepness of the slopes, presents the risk of water erosion. Some slopes are steep enough to be only semi-arable (which combined with shallow rocky soils makes some slopes non-arable). Gullies cut through many paddocks making access difficult. The subsoil clays have low permeability and are generally sodic, which provides for poor infiltration of rainfall and greater risk of runoff and erosion. Saline seepage occurs, especially on lower slopes and in gullies. Ironstone, when present, reduces soil fertility by 'fixing' phosphorous. The few sandy soils pose a wind erosion risk. Many soils have some fine carbonate in the lower subsoil, especially on crests, lower slopes and in drainage depressions.

Soil Landscape Unit summary: Cygnet Escarpment Land System (CYE)

SLU	% of area	Main features #
DRB DRM DRMg DRN DRZ	0.4 3.8 10.4 30.4 1.1	Arable to non-arable slopes and summit surfaces with soils forming on weathering rock. Main soils: stony texture contrast soil - moderate to shallow depth, stony sandy loam over sodic clay on weathering rock **K3**-**D7**-**K4** (*stony Red-Brown Sodosol*). With 10-30% rocky soil - shallow rocky sandy loamy soils over weathering rock **L1** (*rocky Tenosol*). With 0-10% deeper ironstone soil **J2**-**J1** (*Ferric Brown-Red Sodosol*). **DRB** – slopes (1.5-3.5%, 2e) **DRM** – slopes with <10% saline seepage (slopes 4-10%, 3e, 1-2g, 2s) **DRMg** – slopes with gullies with <10% saline seepage (slopes 4-10%, 3e, 3g, 2-3^{o}s) **DRN** – slopes with gullies with <10% saline seepage (slopes 10-25%, 4e, 4g, 2-3^{o}s-2-3^{+}s) **DRZ** – summit surface. Summary: the main issues are stoniness, water erosion risk on sloping land, restricted waterholding capacity in many soils due to stone and rock fragments and shallow soils, and the presence of many sodic clay subsoils; while minor saline seepage occurs in some areas.
DVA DVB DVC DVL DVM DVN DVO DVZ	0.6 0.8 3.7 1.2 15.1 3.7 2.4 2.0	Arable to semi-arable slopes and plains, with soils forming on weathering rock, and deeper soils usually with ironstone. Main soils: stony texture contrast soil - moderate to shallow depth, stony sandy loam over sodic clay on weathering rock **K4**-**D7**-**K3** (*stony Brown-Red Sodosol*). With 10-40% sandy loam usually with ironstone gravel, over sodic clay **J2**-**J1** (*Ferric Brown-Red Sodosol*). With 0-10% shallow rocky soil **L1** (*rocky Tenosol*). **DVA** – gently undulating plain. **DVB** – slopes (1.5-3.5%, 2e) **DVC** – slopes with some gullies (slopes 4-10%, 3e, 2-1g) **DVL** – slopes with gullies with <10% saline seepage (slopes 1.5-3.5%, 2e, 3g, 2-3s) **DVM** – slopes with gullies with <10% saline seepage (slopes 4-10%, 3e, 3-2g, 2-3s or 2-3^{o}s) **DVN** – slopes with gullies with <10% saline seepage (slopes 8-13%, 4-3e, 4g, 2-3s) **DVO** – drainage depression and lower slopes with <10% saline seepage (slopes 4-8%, 3-2e, 4g, 2-3s) **DVZ** – summit surface. Summary: the main issues are stoniness, water erosion risk on sloping land, reduced fertility where ironstone gravel occurs, waterholding capacity being somewhat restricted by stones, and sodic subsoils; while minor saline seepage occurs, and waterlogging is an issue in the drainage depression.
AOB AOCs	0.9 5.8	Non-arable slopes. Main soils: stony texture contrast soil - moderate to shallow depth, stony sandy loam over sodic clay over weathering rock **K3**-**D7**-**K4** (*stony Red-Brown Sodosol*). With 10-40% shallow rocky soil **L1** (*rocky Tenosol*). **AOB** – slopes with gullies (slopes 10-20%, relief <30m, 4-5e, 4g) **AOCs** – slopes with gullies with <10% saline seepage (slopes 10-20%, relief >30m, 4-5e, 4-3g, 2^{o}s) Summary: non-arable due to moderately steep slopes and shallow stony and rocky soils.
FDM FDZ	3.4 0.5	Arable slopes: ironstone soils with patches of slight gilgai relief, and some soils forming on weathering rock. Main soils: ironstone soil - sandy loam usually with ironstone gravel over sodic clay **J2**-**J1** (*Ferric Brown-Red Sodosol*). With 10-40% sandy loam, often with ironstone gravel, over cracking and sodic clay **J2**-**F2** (*Vertic Brown Sodosol*) in areas of slight gilgai relief and stony texture contrast soil - moderate to shallow depth, stony sandy loam over sodic clay on weathering rock **K4**-**K3**-**D7** (*stony Brown-Red Sodosol*). **FDM** – slopes with some gullies with <10% saline seepage (slopes 4-10%, 2g, 2s) **FDZ** – gently undulating summit surface (slopes 0-3%, 1-2e) Summary: the main issues are the reduced fertility due to phosphorous fixation where ironstone gravel occurs, sodic subsoils, and some water erosion risk; while some areas with raised subsoil salinity levels occur.

PaK PaM	0.8 1.9	Arable slopes and raised plain/plateau. Main soils: sand over sodic clay - thick sandy topsoil over sodic clay **G3** (*sandy Brown Sodosol*) **PaK** – gently undulating raised plain/plateau with <10% saline seepage (slopes 0-4%, 1e, 2-3s) **PaM** – lower slopes and slopes with <10% saline seepage (slopes 3.5-10%, 3-2e, 2-3s) Summary: the main issues are waterlogging, sodic subsoils, infertility/water repellence/wind erosion risk due to the thick sandy topsoils, and raised subsoil salinity levels; while water erosion is also a risk on sloping land.
PnO PnU	1.7 0.9	Non-arable drainage depressions. Main soils: medium thickness with some thick topsoil, with sandy loam surface soil over sandy loam to loamy sand subsurface soil, on a sodic clay subsoil **F2**-**F1** (*Brown-Grey Sodosol*). With 10-40% stony texture contrast soil - stony sandy loams over sodic clay on weathering rock, mostly on lower slopes **K4**-**D7** (*stony Brown-Grey Sodosol*). **PnO** – drainage depression with <10% saline seepage (3-4s) **PnU** – drainage depression and lower slopes with 10-50% saline seepage (4-3*s) Summary: non-arable due to wetness/waterlogging and the likelihood of flooding; some saline seepage also occurs.
PgA PgB PgL PgM PgZ	0.8 0.9 0.5 5.0 1.5	Arable slopes, plains and summit surfaces. Main soils: sand over sodic clay - medium to very thick sandy topsoil (with a few light sandy loams) over sodic clay **G4**-**G3** (*sandy Brown Sodosol*). With 10-40% stony texture contrast soil - stony sandy to loamy topsoils over sodic clay on weathering rock **K4**-**D7** (*stony Brown-Grey Sodosol*). **PgA** – gently undulating plain **PgB** – slopes (1.5-4%, 2-1e) **PgL** – lower slope with <10% saline seepage (slopes 1-3%, 2-1e, 2-3s) **PgM** – slopes with <10% saline seepage (slopes 3.5-10%, 3-2e, 2-3s) **PgZ** – summit surface. Summary: the main issues are infertility/wind erosion risk/water repellence due to sandy topsoils, and sodic subsoils; while water erosion is a risk on sloping land, and areas with raised subsoil salinity occur.

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:

Major Soils:

K3-**D7**-**K4** Stony texture contrast soil (*stony Red-Brown-Grey Sodosol*). Shallow to moderate depth soil over weathering rock. Medium thickness with some thick, light sandy loam to sandy loam, usually with a bleached light sandy loam to light sandy clay loam sub-surface layer, with phyllite and/or quartz fragments (occasionally meta-sandstone), and sometimes with ironstone gravel; over red-brown, yellow-brown, olive-brown, red, or olive sodic clay with mottles, often including soft weathering rock fragments; overlying weathering rock. Often there is some fine carbonate in the lower subsoil, or at the top of the substrate layer. Found on slopes and crests.

J2-**J1**-**F2** Texture contrast soil mostly with ironstone gravel (*Ferric Brown-Red-Grey Sodosol*). Medium thickness to thick, light sandy loam to sandy loam, usually with a bleached, light sandy loam, sandy loam, or loamy sand sub-surface layer, often containing ironstone gravel; over yellow-brown, olive-brown, or red-brown sodic clay with mottles, sometimes with fine carbonate in the lower subsoil. The subsoil sometimes exhibits shrink/swell (vertic) characteristics. Found on flats, slopes, crests, and drainage depressions where it occurs without ironstone gravel and often has a grey subsoil.

Minor Soils:

L1 Rocky soil (*rocky Tenosol*). Shallow soil, with light sandy loam to sandy loam, often with a bleached sandy loam to sandy clay loam sub-surface layer, with phyllite and often quartz fragments (or occasionally meta-sandstone); on weathering rock or rock. Found on slopes and crests.

G3-**G4** Sand over sodic clay (*sandy Brown Sodosol*). Thick to very thick, with some medium thickness, loamy sand over bleached sand, sometimes with ironstone nodules; over yellow-brown to olive-brown sodic clay with mottles. Sometimes with some fine carbonate in the lower subsoil. Found on slopes and crests.

Further information: DEWNR Soil and Land Program