

AGB Agery Basin Land System

A drainage basin with some saline depressions and a few salt lakes.

Area: 20.5 km²

Landscape: A drainage basin with some saline depressions and a few salt lakes (including Agery Swamp). This low lying system is bounded on its eastern and western sides by rising land. Broad drainage depressions to the south feed into the basin, and the basin opens out to the Cunliffe stony plains in the north. The system is practically level, resulting in drainage moving very slowly. Some surface drains have been dug to assist drainage. In the north-central part of the system, a sand dune straddles the basin, completely blocking it. Just north of this sand dune is the lowest part of the basin (occupied by a relatively large salt lake). Salt lakes occupy some of the lowest lying areas, often where drainage is blocked by sand dunes or slightly elevated land. The majority of flow is subsurface.

Sediments found in this system are similar to those on the adjacent rises (Agery Rises land system). It is likely that this area was originally covered by sandy sediments, which were subsequently altered by accessions of wind-blown clay, resulting in sand over clay texture profiles. In addition, alluvial processes are the origin of some clayey sediments. It is likely that these sediments are underlain by even older clayey sediments derived from underlying or adjacent bedrock. Over time, much of the surface sand has been lost by wind and water action. A few 'sand over clay' sand dunes occur in the system.

In more recent times, calcareous loess/dust has been deposited on the system. This has resulted in a few deep to moderate depth deposits of calcareous loam, extensive calcreted areas with shallow soils, hard carbonate rubble in many profiles, and the ubiquitous presence of fine carbonate in subsoils or lower subsoils and some surface soils. Calcrete in low lying areas is typically overlain by clay loamy to clayey sediments: the result of alluvial deposition upon calcrete. The most recent alluvial deposits are evident as loamy surface deposits overlying buried surface soils in low lying areas.

Annual rainfall: 395 – 445 mm average

Main soils:

- B6-B7** Shallow sandy loam to loamy sand over clay on calcrete (around 32% of area)
- D3** Sandy loam to clay loam over red clay (around 19% of area)
- B2** Shallow calcareous sandy loam on calcrete (around 16% of area)
- B3** Shallow sandy loam on calcrete (around 9% of area)
- G4** Loamy sand to sandy loam over clay (around 9% of area)
- N2** Saline soil (approximately 11% of area)

Minor soils: **G3-G4** Sand over clay (approximately 2% of area)

Main features: Much of this low lying system is non arable salinised land, or semi arable marginally saline land. The most common soils are shallow soils on calcrete, and sandy loams to clay loams over clay. Sandy topsoils are inherently infertile, from which soluble nutrients are easily leached. Clayey subsoils limit the loss of nutrients from the profile. Waterlogging is a serious problem in this system, due to clayey subsoils and low lying topography restricting drainage. Salinity caused by saline watertables close to the land surface is a major problem, and the effects of salinity on crops are exacerbated by waterlogging. Wind erosion is a potential problem with sandy soils, especially those on dunes.

Soils with hard carbonate rubble and/or shallow depth to calcrete have reduced effective water holding capacities, and hence reduced production potentials. Also surface rubble interferes with some farming operations.



Some soils are calcareous throughout, but not commonly with highly calcareous surfaces. Calcareous soils can limit the availability of certain nutrients, the level of this effect on crops depends on the level of fine carbonate in the surface soil. Deficiencies of the major nutrient phosphorus and the trace element zinc are common, while deficiencies of the trace elements manganese and iron are possible. Temporary trace element deficiencies can occur in cold and wet conditions with susceptible crops.

Soil Landscape Unit summary: Agery Basin Land System (AGB)

SLU	% of area	Main features #
GKK GKP	6.3 3.5	Land dominated by sand over clay soils. Main soils: <i>sandy loam to clay loam over red clay D3</i> grading to <i>loamy sand to sandy loam over clay G4</i> . With limited to common areas of <i>shallow sandy loam to loamy sand over clay on calcrete B6-B7</i> . And possibly some areas of <i>gradational calcareous clay loam to calcareous loam on clay A6-A5</i> . GKK – low lying plains with some drainage lows (slopes 0-1%). GKP – low lying gently undulating plain, with slight rises, some drainage lows, and a few saline depressions (slopes 0-2%).
OaC	1.6	Land dominated by thick sand over clay sand dunes. Main soils: <i>thick sand over clay G3</i> with some <i>sand over clay G4</i> . OaC – sand dunes.
ObD	0.6	Land dominated by thick sand over clay sand dunes. Main soils: <i>sand over clay G4-G3</i> . ObD – low sand dunes.
QXT	8.2	Land dominated shallow calcareous soils on calcrete. Main soils: <i>shallow calcareous loam on calcrete B2</i> . With limited to common areas of <i>gradational calcareous clay loam A6</i> , and possibly some <i>sandy loam to clay loam over red clay D3</i> , in lows/drainage lows. QXT – low lying level plains with some depression lows and areas of marginal salinity (slopes 0-1%, 4-3s).
QIP	6.1	Land dominated by shallow calcareous soils on calcrete. Main soils: <i>shallow calcareous sandy loam on calcrete B2</i> , with limited to common areas of <i>shallow sandy loam on calcrete B3</i> . Also with minor to limited <i>shallow sandy loam over clay on calcrete B6</i> . Also with various other soils mostly in lows: <i>sandy loam to clay loam over red clay D3</i> , <i>gradational calcareous clay loam A6</i> , and <i>calcareous loam A4-A5</i> . QIP – low lying plains with drainage lows and minor saline depressions (slopes 0-1%).
QsK	6.7	Land dominated by shallow calcareous soils on calcrete. Main soils: <i>shallow calcareous sandy loam on calcrete B2</i> to <i>shallow sandy loam on calcrete B3</i> to <i>shallow sandy loam to loamy sand over clay on calcrete B6-B7</i> . With minor areas of <i>sandy loam to clay loam over red clay D3</i> . QsK – low lying plains (slopes 0-1%).
RDK RDT	4.3 4.5	Land dominated by shallow soils on calcrete. Main soils: <i>shallow sandy loam on calcrete B3</i> grading to <i>shallow calcareous sandy loam on calcrete B2</i> on very slightly elevated ground. Also with minor to limited <i>shallow sandy loam over clay on calcrete B6</i> . And common to extensive areas of <i>sandy loam to clay loam over red clay D3</i> grading to <i>loamy sand to sandy loam over clay G4</i> , in lows. RDK – low lying plains and slight slopes with vague drainage lows (slopes 0-1%). RDT – depression with some drainage lows and marginal salinity (slopes <1%).
RTK RTO RTT	6.8 12.2 26.2	Land dominated by shallow soils on calcrete. Main soils: <i>shallow sandy loam to loamy sand over clay on calcrete B6-B7</i> , including some <i>shallow sandy loam on calcrete B3</i> or <i>shallow calcareous sandy loam on calcrete B2</i> on slightly elevated ground. With limited to common areas of <i>sandy loam to clay loam over red clay D3</i> grading to <i>loamy sand to sandy loam over clay G4</i> in lows. And minor to limited areas of <i>sand over clay G4</i> on very low sandy rises. RTK – low lying plains and slight slopes (slopes 0-1.5%). RTO – depression with some drainage lows and very small saline patches (slopes <1%, 3-4s°). RTT – depression with drainage lows (slopes 0-1%). Most of area has marginal salinity; significant areas of saline land also occur.
ZA- ZD-	19.7 3.4	Saline depressions. Main soils: <i>saline soil N2</i> , with some <i>shallow calcareous loam on calcrete B2</i> . Saline soils are



	largely saline variants of various soils with clayey subsoils (soils A6 to D3 to G4). But also saline variants of shallow soils on calcrete (soils B2 to B3 to B6) on slightly elevated ground, and saline variants of deep to moderate depth calcareous loams (soils A4-A5). ZA- – saline to marginally saline drainage depressions/depressions: some small salt lakes (5-4s). ZD- – salt lakes and highly saline depressions (7-8s).
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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:

Main soils:

- B6-B7** *Shallow sandy loam to loamy sand over clay on calcrete* [Petrocalcic Red-Brown Chromosol-Dermosol]
Thin to medium thickness grey brown to brown loamy sands, sandy loams, loams, sandy clay loams or clay loams overlying red to grey brown clay or clay loam, which is underlain by calcrete at shallow depth. Profiles can contain significant amounts of hard carbonate rubble, and often have calcareous surfaces. **B6** soils have loamy to clay loamy surfaces; **B7** soils have sandy surfaces.
- D3** *Sandy loam to clay loam over red clay* [Red-Brown Chromosol-Sodosol-Dermosol]
Thin to medium thickness grey brown to red brown sandy loams, loams, sandy clay loams or clay loams overlying red to brown to yellowish clay with abundant fine carbonate in the mid to lower subsoil. Clayey substrates can be very wet. Profiles can contain significant amounts of hard carbonate rubble, and sometimes have calcareous surfaces – grading to **A6** soils. Typically found in flats, lows, depressions and drainage depressions.
- B2** *Shallow calcareous sandy loam on calcrete* [Petrocalcic Calcarosol]
Grey brown to red brown calcareous sandy loam, loam, or clay loam with calcrete at shallow depth. Profiles are often only moderately calcareous. Profiles can contain significant amounts of hard carbonate rubble. Typically found on slightly elevated areas.
- B3** *Shallow sandy loam on calcrete* [Petrocalcic Tenosol-Chromosol]
Brown to red brown sandy loam to loamy sand with calcrete at shallow depth. Profiles can be slightly calcareous. Profiles can contain significant amounts of hard carbonate rubble. Typically found on slightly elevated areas and low rises.
- G4** *Loamy sand to sandy loam over clay* [Brown-Red Sodosol-Chromosol]
Medium thickness to thin grey brown loamy sands to light sandy loams overlying red to brown to yellowish clay with abundant fine carbonate in the mid to lower subsoil. Profiles can contain significant amounts of hard carbonate rubble, and sometimes have slightly to moderately calcareous surfaces.
- N2** *Saline soil* [Salic Hydrosol]
Largely saline variants of various soils with clayey subsoils (soils **A6** to **D3** to **G4**). But also saline variants of shallow soils on calcrete (soils **B2** to **B3** to **B6**) on slightly elevated ground, and saline variants of deep to moderate depth calcareous loams (soils **A4-A5**).

Minor soils:

- G3-G4** *Sand over clay* [Brown-Red Sodosol-Chromosol]
Medium thickness to very thick sand overlying clayey to clay loamy subsoils. **G3** soils have thick to very thick topsoils; **G4** soils have medium thickness topsoils. Sandy subsurface layers are typically bleached. Subsoils are typically coarsely structured. Profiles are occasionally calcareous throughout, with moderate to slightly calcareous surfaces. Found on dunes.

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

