

WEL Weaver Lagoon Land System

Gently undulating to undulating plains and rises with numerous salt lakes

Area: 88.0 km²

Landscape: Plains and rises with numerous ancient salt lake depressions, some of which are very large. Weaver Lagoon is the largest salt lake in this system, and the second largest on the Peninsula after Lake Fowler. (Lake Fowler and most of the other ancient salt lakes are included in the Bookamurray land system.) The other named salt lake is Diamond Lake, in the south of the system. This system is mostly somewhat higher in elevation than the Bookamurray system to the west, and is divided from it by a rise aligned north-south (indicating a fault line?). Slopes are mostly between 0% and 4%. Calcrete underlies many of soils at shallow depth. These soils are mostly calcareous on rises, and calcareous to non calcareous in lower lying areas. Lower lying areas are underlain by blocky structured clayey sediments (Blanchetown Clay equivalent). Deeper calcareous soils occur mostly on rises. A saline water table is not far below the surface, especially in lower lying areas and depressions. Most areas are affected by saline seepage to some degree, ranging from raised subsoil salinity, to marginal salinity, to non arable saline depressions. The ancient salt lakes are salt encrusted and occupy significant depressions in the landscape. Gypsum-rich deposits are situated beside many salt lakes, and are often concentrated on the south-eastern shore. Drainage, mostly below ground, seems to be to the southwest, as indicated by the alignment of saline drainage depressions.

Annual rainfall: 415 - 435 mm average

Main soils: **B2** *Shallow calcareous loam on calcrete*
A4 *Deep calcareous loam*

Minor soils: **B3** *Shallow loam on calcrete*
N2 *Saline soil*
A8 *Gypseous calcareous loam*

Main features: Surface soils are mostly sandy loams. Subsoils are mostly loamy to light clayey. Many soils are calcareous throughout. Those soils which are not calcareous throughout have alkaline to neutral surface soils. Agricultural use is restricted by shallow stony soils with limited moisture storage capacity, hard carbonate fragments which interfere with many farming practices and restrict water holding capacity, and raised salinity levels where soils are able to be cropped. Calcrete can be ripped for high value horticultural crops, however, this may not greatly increase rooting depth and plant available moisture, as the calcrete is mostly underlain by very highly calcareous sediments which are often clayey, have very high pH, high sodium and boron levels, and raised salinity levels. Calcareous soils have a reduced availabilities of certain nutrients; in particular phosphorus, zinc and manganese.



Soil Landscape Unit summary: Weaver Lagoon Land System (WEL)

SLU	% of area	Main features #
QnK Qnk1 Qnt QnT1	9.8 0.7 1.7 0.2	Shallow calcareous and non calcareous soils on calcrete. Main soils: <i>shallow calcareous loam on calcrete</i> (soil B2) and <i>shallow loam on calcrete</i> (soil B3). Minor to limited areas of <i>deep rubbly calcareous loam</i> (soil A4). QnK – mostly arable somewhat low lying gently undulating plains with some saline seepage (slopes <1%, 4r, 3-4s). QnK1 – non arable stony plains (slopes <1%, 5r, 3-4s). QnT – semi-arable depression with marginally salinity (slopes <1%, 4r, 4s ^o). QnT1 – non arable stony depressions (slopes <1%, 5r, 4s ^o).
QsK QsT	0.3	Shallow calcareous and non calcareous soils on calcrete, with some shallow texture contrast soils. Main soils: <i>shallow calcareous loam on calcrete</i> (soil B2) and <i>shallow loam on calcrete</i> (soil B3). With minor to common areas of <i>shallow loam over red-brown clay on calcrete</i> (soil B6). Minor areas of <i>deep calcareous loam</i> (soil A4). QsK – mostly arable gently undulating plains with some saline seepage (slopes 0-2%, 3-4r, 3-2s). QsT – semi-arable low lying plains with marginally salinity (slopes <1%, 3-4r, 4-3s).
QRK	7.7	Mostly shallow calcareous soil on calcrete, with some shallow non calcareous soil. Main soils: <i>shallow calcareous loam on calcrete</i> (soil B2) with limited to common areas of <i>shallow loam on calcrete</i> (soil B3). QRK – mostly arable gently undulating plains with some saline seepage (slopes 0-2%, 4-3r, 3s ^o).
QTK QTL QTT QTTs	7.5 3.7 0.8 0.3	Shallow calcareous soils on calcrete, with some shallow non calcareous soils on calcrete and some deeper soils. Main soils: <i>shallow calcareous loam on calcrete</i> (soil B2) with limited to common areas of <i>shallow loam on calcrete</i> (soil B3) and <i>deep rubbly calcareous loam</i> (soil A4). QTK – mostly arable gently undulating plains with some saline seepage (slopes 0-1.5%, 1e, 3r, 2-3s). QTL – mostly arable slight slopes and undulating plains with some saline seepage (slopes 1-4%, 2-1e, 3r, 2-3s). QTT – semi-arable depression with marginal salinity (slopes <1%, 3-2r, 4-3s ^o). QTTs – semi-arable to non arable depression with marginal salinity and saline patches (slopes <1%, 4-5s+, 4-3r)
QKA QKB QKK QKO	4.0 5.1 1.0 0.9	Mostly shallow calcareous soil on calcrete with deeper soils. Main soils: <i>shallow calcareous loam on calcrete</i> (soil B2) with limited to common areas of <i>deep calcareous loam</i> (soil A4). QKA – arable gently undulating plains (slopes 0-2%, 3r, 2-1s). QKB – arable undulating plains (slopes 1-4%, 3r, 2-1s, 2-1e). QKK – mostly arable gently undulating plain with some saline seepage (slopes 0-2%, 1-2e, 3-2s, 3-4r). QKO – arable to semi-arable depressions with some saline seepage (slopes <1%, 3-4s ^o , 3r).
QHA QHA1 QHK1	2.1 0.2 0.05	Mostly shallow calcareous soil on calcrete. Main soils: <i>shallow calcareous loam on calcrete</i> (soil B2). QHA – mostly arable raised gently undulating plains (slopes 0-1.5%, 4r, 2-1s). QHA1 – non arable undulating plains / rises (slopes 1-4%, 2-1s, 2-1e, 5-4r). QHK1 – non arable plains with some saline seepage (slopes <1%, 3-2s, 5-4r).
ShB ShK ShL ShT ShZ	2.5 9.7 7.2 1.2 15.9	Mostly deep rubbly calcareous soils with some shallow soils on calcrete. Main soils: <i>deep rubbly calcareous loam</i> (soil A4) with limited to extensive areas of <i>shallow calcareous loam on calcrete</i> (soil B2). ShB – arable slopes (slopes 1-3.5%, 2-1e, 2-1s, 2-3r). ShK – arable gently undulating plains with some saline seepage (slopes 0-2%, 2-3r, 3-2s, 1e). ShL – arable slopes and undulating rises with some saline seepage (slopes 1-4%, 2-1e, 2-3r, 3-2s). ShT – semi-arable depressions with marginal salinity (slopes <1%, 2-3r, 4-3s). Soils can be gypsic when adjacent to ancient salt lakes. ShZ – arable raised plains (slopes 0-2%, 2-1s, 2-3r, 1-2e).



SVK	2.2	Mostly deep calcareous soils with some shallow soils on calcrete.
SVB	0.9	Main soils: <i>deep calcareous loam</i> (soil A4) with limited to common areas of <i>shallow calcareous loam on calcrete</i> (soil B2).
SVT	0.1	SVK – arable gently undulating plains (slopes 0-1.5%, 2-3s, 2-3r, 1-2e). SVB – arable undulating rises (slopes 1-4%, 1-2s, 2-3r, 2-1e). SVT – semi-arable to arable depression (slopes <1%, 4-3s, 2-3r).
SAO	0.1	Mostly deep calcareous soils. Main soils: mostly non rubbly and gypseous(?) <i>deep calcareous loam</i> (soils A4-A8). SAO – mostly arable low lying plain with some saline seepage (slopes <1%, 3s, 1-2r).
ZA-	0.3	Non arable saline land and salt lakes.
ZB-	1.4	Main soils: <i>saline soils</i> (soil N2). The ZA- soil landscape unit includes extensive areas of <i>shallow calcareous loam on calcrete</i> (soil B2) and <i>deep calcareous loam</i> (soil A4). <i>Gypseous calcareous loams</i>
ZC-	0.4	(soil A8) occur extensively to very extensively on the margins of ancient salt lakes (in the ZX- soil
ZD-	9.7	landscape units).
ZX-	2.3	ZA- – salinized depressions (4-3w, 5-4s). ZB- – saline drainage depression (5-4w, 7-5s). ZC- – small and shallow salt lakes (7w, 8-7s). ZD- – ancient (major) salt lakes (7w, 8s). ZX- – deposits (very low lunettes) on the salinized margins of ancient salt lakes, with some low lying saline land (slopes <1%, 2-5w, 7-5s).

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 - gullyng
r - surface rockiness s - salinity w - waterlogging y - exposure

Detailed soil profile descriptions:

Main soils:

- B2** *Shallow calcareous loam on calcrete*. [Petrocalcic Calcarosol]
Shallow rubbly soils on calcrete. Surface soil texture is usually sandy loam or fine sandy loam, or sometimes loam. Surface soils can have a weak granular structure and are grey, brown or reddish brown. Subsoil textures are clay loam, light clay, loam, or less often, sandy loam. Very shallow soils may not have a distinct subsoil. Clay loamy and light clayey subsoils can be sodic and dispersive. Subsoils typically contain accumulations of hard carbonate rubble. Soils are calcareous throughout, being moderately to highly calcareous. An accumulation of fine carbonate occurs in the clay loamy to light clayey substrate below the calcrete, and this often grades to a blocky red clay, especially in lower lying areas. Conditions in the substrate are usually unsuitable for root growth, as pH is very high, boron and sodium levels are high, and salinity levels are raised.
- A4** *Deep calcareous loam*. [Lithocalcic, Supracalcic and Hypercalcic Calcarosol]
These are moderately deep to deep soils with calcareous grey loamy surface soils which grade to highly calcareous clay loam or light clay. There is usually an accumulation of hard carbonate rubble in the profile, and an abundant accumulation of fine carbonate below this. Many profiles are very rubbly. Profiles are usually deep and well drained, and are typically found on rising ground.

Minor soils:

- B3** *Shallow loam on calcrete*. [Petrocalcic Tenosol-Chromosol]
Shallow to very shallow rubbly soils on calcrete. Surface soil texture is usually sandy loam or fine sandy loam. Surface soils can have a weak granular structure, are red-brown, and may be slightly calcareous. Very shallow soils typically have no distinct subsoil. Subsoil are red-brown to red with textures of usually clay loam to light clay. Subsoils are often sodic and dispersive. Subsoils typically contain accumulations



of hard carbonate rubble. An accumulation of fine carbonate occurs in the clay loamy to light clayey substrate below the calcrete, and this usually grades to a blocky red clay. Conditions in the substrate are usually unsuitable for root growth, as pH is very high, boron and sodium levels are high, and salinity levels can be high. These soils typically occur in low lying areas.

N2 *Saline soil.* [Hypersalic-Salic Hydrosol]

In the very highly saline ancient salt lakes, these soils are bare of vegetation and have a thin surface salt crust, which is underlain by sediments rich in salt crystals and 'fluffy' gypsum. A typical profile has calcareous sandy loam to loamy sand overlying green-grey to olive-brown non calcareous clay. A range of saline soil profiles occur on land which is not so highly saline. Shallow soils on calcrete are the most common. Deep clay loamy soils with hard carbonate rubble often occur where calcrete has been 'dissolved'. In these areas samphire, sea barley grass, and bare patches are common.

A8 *Gypseous calcareous loam.*

[Gypsic Lithocalcic-Supracalcic-Hypercalcic Calcarosol or Hypergypsic Calcarosol]

These saline and gypsum-rich soils occur beside salt lakes. They are composed of wind-deposited sediments which are derived from the surfaces of the lakes. A typical profile has a silty loam surface soil which grades to a silty clay loam subsoil. Powdery or flakey gypsum accumulations occur in the subsoil. These soils are calcareous throughout and fine carbonate content increases with depth. Accumulations of hard carbonate rubble can also occur in the profile. These soils have naturally high salinity levels and are too saline to be used for agricultural production.

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

