MIM Mimimi Land System

Area: 193.9 km^2

Annual rainfall: 525 – 565 mm average

Geology: The landscape is a siliceous sandspread of Pleistocene-Holocene Molineaux Sand which overlies fluvio-lacustrine clayey sands of the Pliocene Parilla Sand, which is exposed in swales and depressions. The sand plain abuts the higher land to the west and north where the Pleistocene calcarenite of the Bridgewater Formation stranded beach ridges occur.

Landscape: The land system is an undulating sand plain with occasional sand ridges and patches of ironstone gravel. Swamps are rare.

Elevation: 80 - 110 m

Relief: Maximum 30 m

Main soils: The soils fall into main groups, sand over clay, deep sand with occasional outcropping of limestone on sand ridges and heavier soils on the flats.

Sandy soils (Sand Dunes, sandy rises, sandy flats)
H3 Bleached siliceous sand
H2 Siliceous sand
G2 Bleached sand over sandy clay loam
G3 Thick sand over clay
G4 Sand over poorly structured clay
Heavy flat/Swamp
F2 Sandy loam over poorly structured brown or dark clay
E3 Grey or brown cracking clay
M2 Deep friable gradational clay loam
N3 Wet soil (non to moderately saline)
Stony rises within sand ridges
B3 Shallow sandy loam on calcrete
B6 Shallow loam over red clay on calcrete
B7 Shallow sand over clay on calcrete
B2 Shallow calcareous loam on calcrete

Main features: The Mimimi Land System comprises a complex of non-arable sandy rises with arable sand and heavier flats. The sandy rises and sand plains are prone to water repellence and wind erosion. Other limitations include moderate to moderately low fertility, soil acidity. This Land System is unsuitable for regular cropping unless major management changes occur.

Soil Landscape Unit summary: 22 Soil Landscape Units (SLUs) mapped in the Mimimi Land System:

SLU	% of area	Main features #
MHC MHI MHM	2.2 0.8 0.6	Isolated sandhills throughout the northern parts of the land system with up to 20 m high and slopes up to 6%. The ridges are formed on calcreted calcarenite and are partially overlain by sand spreads which tend to be more extensive on the eastern slopes. Sand is sometimes in dune form. **MHC** Undulating rises to low hills **MHI** Undulating rises to low hills with up to 10% non-saline, non-swampy depressions **MHM** Undulating rises to low hills with 10-50% non-saline, non-swampy depressions Main soils: *Sandhills and sandspreads:* Bleached siliceous sand - **H3** (E), sand grading to sandy clay loam - **G2** (E), and thick sand over clay - **G3** (L) and siliceous sand - **H2** (M). These soils are deep with low fertility. Severe water repellence and soil acidity are limitations for pasture and crop growth and is susceptible to wind erosion. *Stony rises and ridges:* Shallow sandy loam on calcrete - **B3** (L), shallow loam over red-brown clay on calcrete - **B6** (L), shallow sand over clay on calcrete - **B7** (M) and shallow calcareous loam on calcrete - **B2** (M). This land is semi-arable as these soils are very shallow and/or stony and have moderately low to low waterholding capacity and fertility.
MSC	0.2	Isolated sandhill situated in north of the land system which is an undulating rise to low sandhill with mainly bleached siliceous sand - **H3** (V) and sand grading to sandy clay loam - **G2** (C). These soils are deep with low fertility. Severe water repellence and soil acidity are limitations for pasture and crop growth and is susceptible to wind erosion
OJJ	0.7	30-60% low dunes and/or sandy rises with thick to very thick sandy surfaces. Main soils: bleached siliceous sand - **H3** (E), sand grading to sandy clay loam - **G2** (E), thick sand over clay - **G3** (E) and sand over poorly structured clay - **G4** (M). These soils are deep with low fertility. Severe water repellence and soil acidity are limitations for pasture and crop growth and is susceptible to wind erosion. The swale soils are deep and have moderately low fertility and moderate limitation for root growth penetration and waterlogging due to the poorly structured subsoil clays.
ONE ONF ONI	1.6 13.8 1.6	Sandy complex with up to 90% low sand dunes and sand dunes. The dunes generally run east-west, with sandy flats interspersed. Stony rises are limited and usually occur on the western side of the sand rise. Relief is up to 30 m and slopes are to %. **ONE** 60-90% high sand dune coverage **ONF** 60-90% sand dune or sandy rise coverage **ONI** 30-60% sand dune coverage Main soils: bleached siliceous sand - **H3** (E), sand grading to sandy clay loam - **G2** (E), thick sand over clay - **G3** (C) and sand over poorly structured clay - **G4** (M). These soils are deep with low fertility. Severe water repellence and soil acidity are limitations for pasture and crop growth and is susceptible to wind erosion. The swale or plain soils are deep and have moderately low fertility and moderate limitation for root growth penetration and waterlogging due to the poorly structured subsoil clays. Minor shallow soils occur (as described above in **MHC** SLU) Land is semi-arable as these soils are very shallow and/or stony and have moderately low to low waterholding capacity and fertility.
OQE OQF OQG OQI OQJ	1.8 4.2 0.6 6.7 17.2	Sandy complex with up to 90% sand dunes of varying height. The dunes generally run east-west to NW-SE with sandy flats interspersed. This unit has minor depressions. **OQE** 60-90% high sand dune coverage **OQF** 60-90% sand dune or sandy rise coverage **OQG** 60-90% low dunes and sandy rise coverage **OQI** 30-60% sand dune coverage **OQJ** 30-60% low dunes and sandy rise coverage

		Main soils: bleached siliceous sand - **H3** (E), sand grading to sandy clay loam - **G2** (E), thick sand over clay - **G3** (C). These soils are deep with low fertility. Severe water repellence and soil acidity are limitations for pasture and crop growth and is susceptible to wind erosion. Soils found in the swales include the above and sand over poorly structured clay - **G4** (L). These soils are deep and have moderately low fertility and moderate limitation for root growth penetration and waterlogging due to the poorly structured subsoil clays. Minor shallow soils occur (as described above in **MHC** SLU). This land is semi-arable as these soils are very shallow and/or stony and have moderately low to low waterholding capacity and fertility.
PCA PCB PCa PCb	2.2 6.3 1.1 21.9	Level plains to gently undulating plains found to the west of the Land System between sandy rises and dunes. **PCA** Level plains **PCB** Undulating rises **PCa** Level plains with 10-30% sand dunes **PCb** Undulating rises with 10-30% sand dunes Main soils: thick sand over clay - **G3** (E), bleached siliceous sand - **H3** (C), sand grading to sandy clay loam - **G2** (C) and sand over clay - **G4** (L). These soils are deep and have moderately low to low fertility. The plain soils will be susceptible to water repellence and slight limitations to root growth due to poorly structured subsoil clays. Soil acidity may also be a slight limitation on all soils. The rises are limited by severe water repellence, low fertility and susceptibility to wind erosion.
PQA		Flats and swamps within sand plains. Main soils: sandy loam over clay - **F2** (E), deep clay loam - **M2** (E), grey clay - **E3** (M) and wet soil - **N3** (M). Soils are characterised by waterlogging for up to several months and poorly structured clay within 20 cm which restrict root growth penetration. These areas are not suitable for cropping
PWb	2.5	Undulating rises with 10-30% sand dunes <10% swamps. Main soils: thick sand over clay - **G3** (E), sand grading to sandy clay loam- **G2** (C), bleached siliceous sand - **H3** (L) and sand over poorly structured clay- **G4** (L). The soils are deep with moderate to high water holding capacity. Their limitations are moderately low fertility and wind erosion susceptibility. The low lying areas may have some restriction to root growth with dispersive subsoil clay and susceptibility to waterlogging.
PYA PYB PYb	8.5 4.7 0.8	Gently undulating plains to gently undulating rises with sand dunes and no swamps. **PYA** Gently undulating plain **PYB** Undulating rises **PYb** Undulating rises with 10-30% sand dunes Main soils: sand over clay - **G4** (E), bleached siliceous sand - **H3** (C), thick sand over clay - **G3**(E), sand grading to sandy clay loam - **G2** (L), shallow loam over red-brown clay on calcrete - **B6** (M) and loam over red clay - **D2** (M). These soils are deep and have moderate to low fertility, depending on elevation. The deep sandy soils limitations are soil acidity, water repellence, rapid drainage and susceptibility to wind erosion while the shallow sand over clay soils limitations include limited root growth penetration due to dispersive subsoil clay, susceptibility to waterlogging and soil acidity.

PROPORTION codes assigned to soils within Soil Landscape Units (SLU):

(D)	Dominant in extent (>90% of SLU)	(C)	Common in extent (20–30% of SLU)
(V)	Very extensive in extent (60–90% of SLU)	(L)	Limited in extent (10–20% of SLU)
(E)	Extensive in extent (30–60% of SLU)	(M)	Minor in extent (<10% of SLU)

Detailed soil profile description:

(In alphabetic order)

B3 Shallow sandy loam on calcrete (Petrocalcic, Orthic Tenosol)
Loamy sand to loam with variable rubble and slight clay increase with depth overlying calcreted calcarenite shallower than 50 cm. Extensive on stony rises.

B6 Sandy loam over red sandy clay on calcrete (Petrocalcic, Red Kandosol)
Medium thickness loamy sand with slight ironstone gravel overlying a weakly structured reddish brown sandy clay on calcarenite within 50 cm.

E3 Brown or grey cracking clay (Brown-Grey Vertosol)

F2 Sandy loam over poorly structured clay (Mottled-Mesonatric, Grey-Brown Sodosol)
Thin to medium sandy loam to loamy sand abruptly overlying a hard columnar structured dispersive brown to grey medium clay.

G2 Bleached sand over sandy clay loam (Mesotrophic, Haplic, Kandosol/Chromosol)
Medium to thick loose non-calcareous grey sand with a bleached A2 layer grading to yellowish sand, clear change, overlying an orange/brown sandy clay loam.

G3 Thick sand over clay (Subnatric, Brown Sodosol/Chromosol)
Thick sand with a bleached A2 layer, clearly overlying a weak to moderate structured brown clay to sandy clay.

G4 Sand over poorly structured clay (Subnatric, Brown Sodosol)
Medium sand with a bleached A2 layer clearly overlying a hard columnar structured dispersive brown mottled clay.

H2 Siliceous sand (Basic, Arenic, Orthic Tenosol)
Thick loose non-calcareous grey sand over a yellowish sand, continuing over 150 cm.

H3 Bleached siliceous sand (Bleached-Orthic, Arenic, Basic Tenosol)
Medium to thick loose non-calcareous grey sand, grading to white sand then to yellowish sand, continuing below 150cm.

M2 Deep friable gradational clay loam (Red-Brown-Grey- Black Dermosol)
Deep well structured red clay loamy soil.

N3 Wet soil - non to moderately saline (Dermosolic, Oxyaquic Hydrosol)
Medium thickness clay overlying dispersive grey clay with increasing pH at depth.

(Grouped on landscape position)

Sandy soils (Sand dunes, sandy rises and sandy flats)

H3 Bleached siliceous sand (Bleached-Orthic, Arenic, Basic Tenosol)
Medium to thick loose non-calcareous grey sand, grading to white sand then to yellowish sand, continuing below 150cm.

G2 Bleached sand over sandy clay loam (Mesotrophic, Haplic, Kandosol/Chromosol)
Medium to thick loose non-calcareous grey sand with a bleached A2 layer grading to yellowish sand, clear change, overlying an orange/brown sandy clay loam.

G3 Thick sand over clay (Subnatric, Brown Sodosol/Chromosol)
Thick sand with a bleached A2 layer, clearly overlying a weak to moderate structured brown clay to sandy clay.

H2 Siliceous sand (Basic, Arenic, Orthic Tenosol)
Thick loose non-calcareous grey sand over a yellowish sand, continuing over 150 cm.

G4 Sand over poorly structured clay (Subnatric, Brown Sodosol)
Medium sand with a bleached A2 layer clearly overlying a hard columnar structured dispersive brown mottled clay.

Heavy flats/swamps

F2 Sandy loam over poorly structured clay (Mottled-Mesonatric, Grey-Brown Sodosol)
Thin to medium sandy loam to loamy sand abruptly overlying a hard columnar structured dispersive brown to grey medium clay.

E3 Brown or grey cracking clay (Brown-Grey Vertosol)

M2 Deep friable gradational clay loam (Red-Brown-Grey- Black Dermosol)
Deep well structured red clay loamy soil.

N3 Wet soil - non to moderately saline (Dermosolic, Oxyaquic Hydrosol)
Medium thickness clay overlying dispersive grey clay with increasing pH at depth.

Stony rises within sand ridges

B3 Shallow sandy loam on calcrete(Petrocalcic, Orthic Tenosol)
Loamy sand to loam with variable rubble and slight clay increase with depth overlying calcreted calcarenite shallower than 50 cm. Extensive on stony rises.

B6 Sandy loam over red sandy clay on calcrete (Petrocalcic, Red Kandosol)
Medium thickness loamy sand with slight ironstone gravel overlying a weakly structured reddish brown sandy clay on calcarenite within 50 cm.

B7 Shallow sand over sandy clay on calcrete (Petrocalcic, Brown Chromosol)
Medium thickness sand overlying brown friable sandy clay to clay on limestone or calcreted sandy clay within 50 cm - flats.

B2 Shallow calcareous loam on calcrete (Petrocalcic, Hpyocalcic Calcarosol)
Thin calcareous loam to clay loam directly overlying calcarenite within 30 cm

Further information: DEWNR Soil and Land Program