GAM Gambier Land System

Area: 274.8 km²

Landscape: Undulating plains and rises covered with ash deposits derived from Mt. Gambier and

Mt. Schank volcanoes. The volcanoes form prominent cones above the surrounding plains. Soils vary from shallow over limestone to deep where sand underlies the ash. The deeper volcanic soils occur close to the volcanoes, and conversely the ash thins

away from them.

Annual rainfall: 745 – 805 mm average

Geology: Holocene volcanic rocks and ash variously overlie Pleistocene Bridgewater Formation

calcarenite stranded beach ridges, Coomandook formation lagoonal deposits and

Eocene Gambier Limestone marine limestones

Main soils: O1 (47%) Volcanic soil (Andic Tenosol)

The volcanic ash soils near Mt. Gambier and Mt. Schank are very dark brown to black, strongly structured loamy soils, which overlie layered and welded volcanic

ash containing volcanic bombs or limestone fragments.

B3 (14%) Shallow Loamy Sand on Calcrete (Petrocalcic Tenosol/Rudosol)

Minor soils: I1 (10%) Deep Sand (Arenic Podosol)

B6 (10%) Shallow Loam over Red Clay on Calcrete (Petrocalcic Red Chromosol)

Summary: The deeper volcanic soils within a few km. of the volcanoes are very fertile, well

drained and are highly productive, becoming less fertile as the ash deposits thin. Soil pH's are mostly near neutral in the surface, becoming more alkaline with depth. Moisture-holding capacity is moderate to low, on the deeper soils on lower slopes and plains, but is low where soils are shallow over calcrete or limestone on the

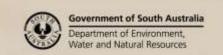
surrounding plains and old beach ridge ranges.

Inherent fertility in the soils overlain with volcanic ash is variable and usually lower than

the volcanic ash soils.

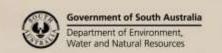
Soil Landscape Unit summary: Gambier Land System (GAM)

SLU	% of area	Component	Main soils	Prop#	Notes
MELv	0.13	Plain	В3	٧	Swale with sandy & rocky rises with variable thickness,
		Rise	Н3	L	surface layer of ash.
					Main soils:
					Plains: Shallow sandy loam on calcrete - B3.
					Rises: Bleached siliceous sand - H3.
MOBv	0.37	Rise	B6B3	D	Gently undulating former beach ridge with ironstone
					gravelly sandy loam over red clay on calcreted aeolianite.
					Volcanic ash in surface horizon.
					Main soils: <u>Shallow sandy loam over red-brown clay on</u>
					<u>calcrete</u> - B6 and <u>Shallow sandy loam on calcrete</u> - B3 .
MRCv	0.23	Rise	G3	D	Shallow sandy loam over red clay on calcreted aeolianite.
					Volcanic ash in surface horizon.
					Main soils: Thick sand over clay - G3 .
OFCv	0.49	Dune	11	D	Deep sand on dune. Volcanic ash in surface horizon.
					Main soils: <u>Highly leached sand</u> - I1 .
PBEv	0.20	Depression	01	D	Ash covered sandy swale.
					Main soils: <u>Volcanic ash soil</u> - 01 .



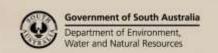


DDby	0.00	Dlain	Cala	1//	Sand over algunation with 10 2007 sand rises. Valognia ash in
PPbv	0.28	Plain Sand rise	G3I2	L	Sand over clay plain with 10-20% sand rises. Volcanic ash in surface horizon.
		Sana rise		L	Sunace nonzon. Main soils:
					Plains: Thick sand over clay - G3 and Wet highly leached
					sand - 12.
					Sandy rises: Highly leached sand - 11.
mFAv	0.35	Plain/rise	B6B3	D	Low rise with shallow sandy loam over poorly structured
1111 1 1 7	0.00	1 1011 1/1130	5050		clay on limestone. Ash covered.
					Main soils: Shallow sandy loam over red-brown clay on
					<u>calcrete</u> - B6 and <u>Shallow sandy loam on calcrete</u> - B3 .
vAA	15.48	Plain	01	D	Slopes and plains adjacent to and in the proximity of
vAB	1.93	Volcano	01	D	extinct volcanoes with moderately deep tuffaceous loamy
		slope			fertile black Dermosols and Tenosols over limestone. The
					soils commonly contain ejecta including fragments of
					bryozoal limestone derived from the country rock as well as
					basaltic tuff and olivine bombs. Soils are well-to-excessively
					drained, especially on slopes of volcanoes. Some tillage
					interference from rock fragments.
	. 70	5	0.1		Main soils: Volcanic ash soil - O1.
vBA	1.70	Plain	01	D V	Moderately shallow, dark volcanic soils on welded tuff/ash
vBB	5.68	Plain	01	C	over calcreted limestone
vBC	0.55	Rise	0111	D	vBA Loamy, dark fertile plain vBB Gently undulating landscape with a complex of
VBC	0.55	Rise	O1B6	D	volcanic soils overlying deep sands on dunes
					vBC Undulating land with complex of volcanic soils
					overlying calcreted former beach ridges. Shallow soils
					common.
					Main soils:
					Plains: Volcanic ash soil - O1.
					Rises: Volcanic ash soil - O1, Highly leached sand - I1 and
					<u>Shallow sandy loam over red-brown clay on calcrete</u> - B6 .
vEA	3.23	Plain	1101	D	Deep siliceous sandy soils with surface deposits of volcanic
vEB	4.76	Plain	B3O1	٧	ash.
		Dune	H3I1	С	vEA Loamy volcanic plain on deep sandy soils
vEC	11.86	Dune	1101	V	vEB Gently undulating dunes overlain with dark loamy volcanic ash.
		D:	H3		vEC Undulating land with deep sand dunes, low fertility,
		Rise	B6O1	L	wind erodible.
					Main soils:
					Plains: Highly leached sand - 11, Shallow sandy loam on
					calcrete - B3 and Volcanic ash soil - O1 .
					Dunes: Bleached siliceous sand - H3, Wet highly leached
					sand - 12 and Volcanic ash soil - 01.
					Rises: Shallow sandy loam over red-brown clay on calcrete
					- B6 and <u>Volcanic ash soil</u> - 01 .
vFB	1.13	Rise	O1B6	D	Landscapes with surface deposits of volcanic ash on
		Dune	11	М	calcarenite often with deep sandy soils.
vFC	2.98	Rise	O1B3	٧	vFB Gently undulating rise with shallow volcanic loams
		Dune	0111	L	often over red clay on calcrete. Minor low sand dunes with
			H3		deep sands. Minor clay loamy soils in swales. vFC Undulating slopes as above.
		Swale	O1B6	M	Main soils:
			B4		Rises: Volcanic ash soil - O1, Shallow sandy loam on
					calcrete - B3 and Shallow sandy loam over red-brown clay
					on calcrete - B6.
					Dunes: Volcanic ash soil - O1, Highly leached sand - I1 and
					Bleached siliceous sand - H3.
					Swales: Volcanic ash soil - O1, Shallow sandy loam over
					red-brown clay on calcrete - B6 and <u>Shallow red loam on</u>
					limestone - B4 .
11		DL	0.1	D	
vGA	0.56	Plain	01	D	vGA Plains with often thick, dark volcanic sandy loam over





G.D.		DI :		I	
vGB	0.20	Plain	01	V	vGB Gently undulating plains and rises as above. Loamy
		D:	G3		sand over poorly structured clay also occurs on rises.
		Rise	G3 O1	L	vGBF As above, flinty equivalents, common south of Mt Schank,
vGBF	3.13	Rise	G3	V	Main soils:
VODI	0.10	KISC	G2	•	Plains: Volcanic ash soil - O1 and Thick sand over clay - G3 .
		Plain	G3	С	Rises: Thick sand over clay - G3, Bleached sand over sandy
		T TOTAL	G2		<u>clay loam</u> - G2 and <u>Volcanic ash soil</u> - O1 .
vHA	1.32	Plain	В3	V	Mostly shallow low stony ranges, with sandy loam over red
		Rise	В3	L	clay soils on calcrete. Volcanic ash in surface only. Rock
vHB	0.17	Rise	В3	D	outcrop common on ranges. Former beach ridge.
vHC	4.53	Stony	B3O1	D	vHA plain with <10% rises.
		range			vHB Gently sloping rises
vHE	0.05	Depression	O1B6	D	vHE Depression with volcanic soils and shallow loam over
					red clay on limestone.
					Main soils:
					Plains and rises: Shallow sandy loam on calcrete - B3. Stony ranges: Shallow sandy loam on calcrete - B3 and
					Volcanic ash soil - 01.
					Depressions: Volcanic ash soil - O1 and Shallow sandy loam
					over red-brown clay on calcrete - B6 .
vIA	1.35	Plain	O1B6	٧	Deep loamy volcanic soils in association with shallow loams
		Rise	O1B3	L	grading to red clay on calcrete.
vIC	0.33	Rise	O1B3	D	vIA Plain with 10-20% rises.
					vIC Undulating rises.
					Main soils:
					Plains: Volcanic ash soil - O1 and Shallow sandy loam over
					red-brown clay on calcrete - B6 . Rises: Volcanic ash soil - O1 and <u>Shallow sandy loam on</u>
					calcrete - B3.
vJA	0.77	Plain	01	D	Shallow dark volcanic loamy soils on welded ash, in close
vJC	0.76	Volcano	01	D	proximity to volcanoes.
		slope			vJA Plain
vJG	1.12	Ash cone	01	D	vJC Undulating/moderate slopes.
					Main soils: <u>Volcanic ash soil</u> - O1 .
vKA	11.87	Plain	01	D	Plains & rises with mostly deep loamy to clay loamy, well
		Rise	01	М	structured fertile volcanic soils.
vKB	2.16	Rise	01	D	vKA plain, <10% rises
vKC	8.00	Dune	O1H2	V	vKB gentle slopes. vKC- is a former beach ridge with mostly deep sands
		Rise	01	Е	mantled with volcanic material.
					Main soils:
					Plains and rises: Volcanic ash soil - O1.
					Dunes: Volcanic ash soil - O1 and Deep brown sand - H2
vMC	0.29	Plain	01	V	Plains and rises with deep loamy to clay loamy, well
		Rise	B3B6	С	structured fertile volcanic soils. Some shallow soils on
			1		calcrete.
					Main soils:
			1		Plains: Volcanic ash soil - O1.
					Rises: Shallow sandy loam on calcrete - B3 and Shallow
NID	0.15	Dies	F001		sandy loam over red-brown clay on calcrete - B6 .
vNB	0.15	Rise	F2O1	D	Dark, clay loam over poorly structured, dispersive clay on
			1		rise with deeper volcanic loams. Main soils: <u>Sandy loam over poorly structured brown or dark</u>
					clay - F2 and Volcanic ash soil - O1 .
i i	0.74	Plain	01	D	Plain with shallow, dark, loamy/clay loamy soil on calcrete.
vOA	1 ()/4		_ · ·	-	
vOA	0.74				I Main soils: Voicanic ash soil - OI .
		Stony	B3I1	V	Main soils: Volcanic ash soil - O1. Former beach ridge with shallow sandy loam over calcrete
vOA vPC	10.85	Stony range	B3I1	٧	Former beach ridge with shallow sandy loam over calcrete in association with deep sands; sand over clay soils and
		Stony range Swale	B3I1 G2	V	Former beach ridge with shallow sandy loam over calcrete
		range			Former beach ridge with shallow sandy loam over calcrete in association with deep sands; sand over clay soils and





					Stony ranges: Shallow sandy loam on calcrete - B3 and Highly leached sand - I1. Swales: Bleached sand over sandy clay loam - G2 and Volcanic ash soil - O1.
Xl-	0.30	Lake	ww	D	Crater lakes.

PROPORTION codes assigned to Soil Landscape Unit (SLU) components:

D Dominant in extent (>90% of SLU)

V Very extensive in extent (60–90% of SLU)

E Extensive in extent (30–60% of SLU)

C Common in extent (20–30% of SLU)

L Limited in extent (10–20% of SLU)

M Minor in extent (<10% of SLU)

Detailed soil profile descriptions:

- **B3** <u>Shallow sandy loam on calcrete (Petrocalcic Rudosol)</u>
 - Medium thickness non calcareous sandy loam, often having a slight clay increase with depth, over calcreted calcarenite shallower than 50 cm rises.
- Red sandy loam over calcrete (Petrocalcic, Red Dermosol)
 Medium thickness red sandy loam grading to friable red clay loam over calcreted calcarenite within 50 cm rises.
- B6 Shallow sandy loam over red-brown clay on calcrete (Petrocalcic, Red Kandosol)

 Medium thickness sandy loam with slight ironstone gravel overlying a weakly structured reddish brown sandy clay on calcarenite within 50 cm rises.
- Sandy loam over poorly structured brown or dark clay (Brown-Dark Sodosol-Chromosol)

 Topsoil <30 cm over a poorly structured subsoil. Loamy, often sandy loam, to clay loamy texture contrast soil with a sodic/dispersive/poorly structured brown clayey subsoil. Often sandy loam, usually with a bleached horizon, and thin topsoil over a poorly structured B.
- G2 <u>Bleached sand over sandy clay loam (sandy Brown-Red Chromosol)</u>
 Sandy texture contrast soil with a bleached A2 and a friable brown-red sandy clay loam to sandy loam subsoil.
- Thick sand over clay (Hypercalcic, Brown Sodosol/ Chromosol)

 Thick bleached sand with an organically darkened surface abruptly overlying a massive to coarsely structured brown to reddish yellow sandy clay to clay, calcareous with depth rises.
- H3 Deep bleached sand (Basic, Arenic, Bleached -Orthic Tenosol)
 Grey sand over a very thick bleached sand grading to yellow sand continuing below 100 cm.
- Highly leached sand (Fragic, Pipey, Aeric Podosol)

 Grey sand with a very thick bleached A2 layer, over dark brown and yellow massive soft to semi-hard clayey sand (coffee rock), grading to softer yellow and brown sand to sandy clay loam from about 80 cm.
- Wet highly leached sand (Fragic, Humic, Aquic Podosol)
 Grey sand with a thick bleached A2 horizon, overlying a thin to thick layer of coffee rock, grading to pale brown sand sharply overlying a grey, brown and yellow mottled sandy clay loam to light clay.
- O1 <u>Volcanic ash soil (Mostly Podosols and Tenosols)</u>
 Deep volcanic ash soils and soils overlain with volcanic ash.
- **WW** Water

Further information: <u>DEWNR Soil and Land Program</u>

