

7.6 Drummond Land System (Dd)

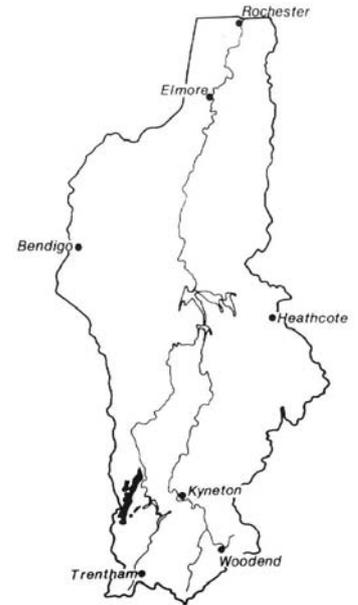
This land system is situated to the south-west of Malmesbury on a narrow basalt flow that emanated from a cone known as “Kangaroo Hill”. Deep incision into the adjacent Ordovician sediments by twin lateral streams has left the area as a raised plain flanked by prominent scarps. Two adjacent basaltic plains and cones have been included in the land system.

Brown duplex soils containing buckshot occupy the flatter parts of the plain, with red duplex soils becoming common on the slopes near the cones. Shallow stony red uniform or gradational soils occur on the cones and scarps, while dark gradational soils occupy the few drainage depressions.

Most of the native vegetation has been cleared. The remnants are dominated by *E. viminalis*, mixed with *E. pauciflora* on the scarps and *E. obliqua* and *E. ovata* on the plain.

Grazing of native and introduced pastures is the major land use, but productivity is restricted by poor drainage on most of the plain, low winter temperatures and the tendency of the silty topsoils to compaction, and by the shallow rocky soils on the cones and scarp.

The area is relatively stable, apart from a potential for landslips on the steep scarps.

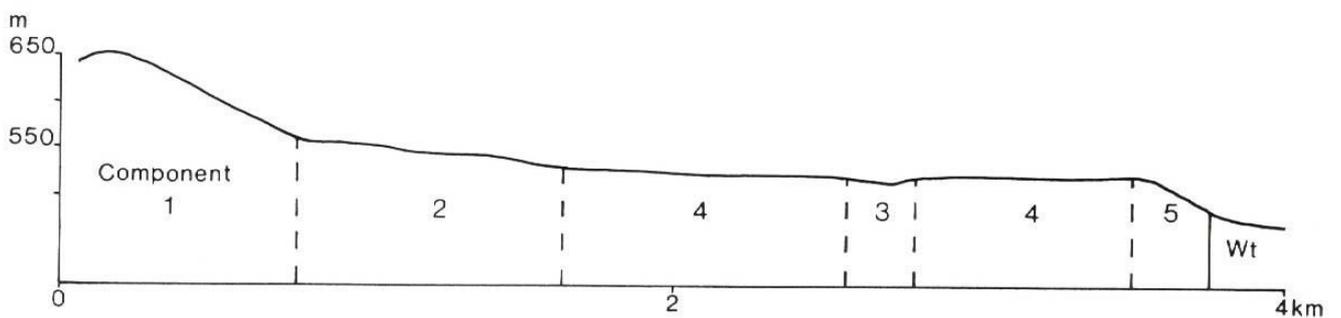
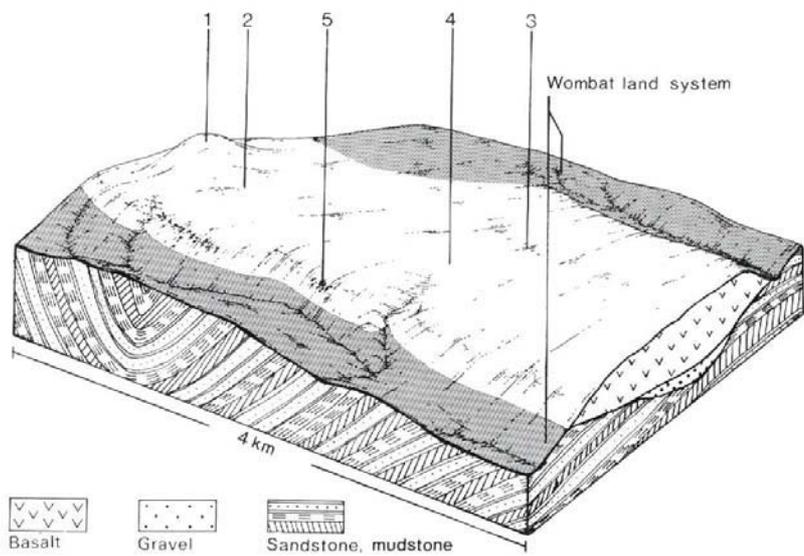


Lateral incision by the Coliban River (left) and Kangaroo Creek (to the right of the photo) has left the Drummond basalt flow as an elevated long narrow plain.



This mullock heap is a reminder of past mining endeavours to find gold in the river-bed beneath the basalt.

Cattle grazing on improved pastures.



DRUMMOND LAND SYSTEM (Dd) Area 21 km² 0.5% of catchment

CLIMATE Rainfall, mean (mm) Temperature, mean (°C) Seasonal growth limitations	Annual, 750-900; lowest January (35-40), highest June (85-90) Annual, 12; lowest July, highest January (18.5) Temperature less than 10°C (av.): mid April – mid September Rainfall less than potential evapotranspiration: mid October - March				
GEOLOGY Age, rock type	Pliocene, olivine basalt				
PHYSIOGRAPHY Landform pattern Elevation range (m) Relative relief (m) Drainage pattern Channel spacing	Gently undulating plain bounded by scarps; isolated volcanic cones 450-656 Usually <10 Dendritic Sparse				
LAND COMPONENT Number Percentage of land system	1 5	2 15	3 5	4 60	5 15
PHYSIOGRAPHY Landform element Slope; modal, range (%) Site drainage	Volcanic cone 30, 10-50 Somewhat excessively drained	Slop adjacent to volcanic cone 2, 10-10 Moderately well drained	Minor drainage depression 0, 0-1 Somewhat poorly drained	Gently undulating plain 1, 0-4 Moderately well drained	Scarp 8, 5-15 Somewhat excessively drained
SOIL Parent material Description Classification Surface texture Depth to hardpan or bedrock (m) Nutrient status Available water capacity Permeability Exposed rock/stone (%) Sampled site number	Basalt Red uniform soils on the crests and gradational soils on the slopes Um6, Gn3.11 Silty loam 0.1-0.5 Moderate Low to moderate Moderate to rapid 5-50 -	Basalt Red duplex soils, often with a red upper B horizon overlying a mottled, grey lower B horizon Dr2.11 Silty loam >1.5 Low surface, moderate subsoil Moderate Moderate surface, slow subsoil 0-1 1115	Alluvium Black gradational soils, often with free calcium carbonate in the subsoil Gn3.43 Silty clay loam >2.0 Moderate surface, high subsoil High Moderate surface, slow subsoil 0 1122	Basalt Brown duplex soils, with strongly mottled clay subsoils and buckshot throughout Db4.11, minor Gn3.11 Silty loam >1.5 Low to moderate High Moderate surface, slow subsoil 0 1056	Basalt Red soils or uniform or gradational texture, often with basalt rocks throughout the profile Um, Gn3.12 Silty loam 0.2-0.5 Moderate Low to moderate Moderate to rapid 0-20 1096
NATIVE VEGETATION Structure Characteristic species (+ indicates predominant species)	Open forest II <i>E. viminalis</i>	Open forest II <i>E. viminalis</i>	Open forest II <i>E. ovata</i>	Open forest II <i>E. viminalis</i> +, <i>E. obliqua</i> <i>E. ovata</i>	Open forest II <i>E. viminalis</i> <i>E. ovata</i> <i>E. pauciflora</i>
PRESENT LAND USE	Grazing	Grazing of sheep and cattle on introduced pastures; minor cropping for grain and hay		Grazing of sheet and cattle on introduced pastures; Minor cropping Vineyards (minor)	
OBSERVED SOIL DETERIORATION	Minor compaction	Minor compaction	Compaction, particularly under moist conditions; minor gully erosion	Compaction, particularly under moist conditions	Minor compaction; minor landslips

SUSCEPTIBILITY OF LAND TO PROCESSES OF SOIL DETERIORATION – Drummond

Compt.	Process	Susceptibility	Critical land factors	Off-site effects	Comments
1	Sheet & rill erosion	Low to moderate	<ul style="list-style-type: none"> steep, often stony, slopes well-aggregated topsoil 	<ul style="list-style-type: none"> sedimentation 	High soil permeability and a perennial vegetation cover usually limit this process of deterioration
	Leaching of nutrients	Moderate	<ul style="list-style-type: none"> moderate to high soil permeability moderate cation exchange capacity 	<ul style="list-style-type: none"> - 	-
	Compaction of topsoil	Moderate	<ul style="list-style-type: none"> loamy texture moderate organic matter content 	<ul style="list-style-type: none"> increased run-on 	-
2&4	Compaction of topsoil	Moderate	<ul style="list-style-type: none"> loamy texture moderate organic matter content 	<ul style="list-style-type: none"> increased run-on 	-
3	Gully erosion	Low	<ul style="list-style-type: none"> minor accumulations of alluvium 	<ul style="list-style-type: none"> sedimentation 	The soils are generally very stable and protected by a dense sward of perennial introduced grasses
	Compaction of topsoil	High	<ul style="list-style-type: none"> loamy texture soils frequently moist moderate organic matter content 	<ul style="list-style-type: none"> increased flash flows 	-
5	Sheet & rill erosion	Low to moderate	<ul style="list-style-type: none"> moderate slopes well-aggregated topsoil 	<ul style="list-style-type: none"> sedimentation 	High soil permeability and a perennial vegetation cover usually preclude this process of deterioration
	Landslip	Low to moderate	<ul style="list-style-type: none"> moderate slopes underlying weathered Ordovician bedrock moderate soil permeability 	<ul style="list-style-type: none"> sedimentation 	Landslips usually occur on the scarp immediately below the basalt parent material
	Leaching of nutrients	Low to moderate	<ul style="list-style-type: none"> moderate soil permeability moderate cation exchange capacity 	<ul style="list-style-type: none"> - 	-
	Compaction of topsoil	Moderate	<ul style="list-style-type: none"> loamy texture low-moderate organic matter content 	<ul style="list-style-type: none"> increased run-on 	-



Gully erosion occurring near the edge of the scarp can be successfully stabilised by preventing stock access.



When houses are built on land components susceptible to landslips, severe damage can result.