

**Appendix D - Land Capability Tables used for assessment in Chapter 14 – Land Evaluation and Survey Interpretation.**

**LAND CAPABILITY RATING FOR BUILDING FOUNDATIONS (Slab Construction):** Areas capable of being used for the construction of structures with one or two storeys. It is assumed that commonly used earth moving equipment is available. The table considers factors which affect both construction and the capability of the immediate site for activities closely related to dwellings. Effluent disposal, ease of servicing and access are considered separately.

LAND FEATURES AFFECTING USE	CAPABILITY CLASS				
	1	2	3	4	5
SLOPE (1)	Less than 2%	2% to 5%	5% to 10%	10% to 25%	More than 25%
FLOODING (2)	None	-	-	Less than once in 100 years	More than once in 100 years
BOULDERS (Fragments over 250mm on surface) (3)	Less than 0.2%	0.2% to 1%	1% to 10%	More than 10%	-
ROCK OUTCROP (3)	Less than 0.05%	0.05% to 0.1%	0.1% to 1%	1% to 5%	More than 5%
SITE DRAINAGE (4)	Excessively drained Well drained	Moderately well drained	Imperfectly drained	Poorly drained	Very poorly drained
SHRINK – SWELL POTENTIAL (5)	Less than 12%	12% to 20%	More than 20%	-	-
DEPTH TO SEASONAL WATER TABLE	Deeper than 120 cm	80 cm to 120 cm	50 cm to 80 cm	30 cm to 50 cm	Shallower than 30 cm
UNIFIED SOIL GROUP (SUB-SURFACE) (6)	GW, SW, GP, GM, SP, SC, SM, GC	CL, CH, MH	ML, OL	OH	Pt
DEPTH TO HARD ROCK (7)	More than 120 cm	80 cm to 120 cm	30 cm to 80 cm	Less than 30 cm	-
STONES (Fragments 75 to 250mm in soil profile)	Less than 10%	10% to 20%	20% to 40%	More than 40%	-

**LAND CAPABILITY FOR THE EROSION RISK ASSOCIATED WITH CROPPING:** Areas capable of being used for production of crops such as wheat, oats and barley. It is assumed that commonly used management techniques will be applied, including adequate fertilisation and clean cultivation for weed controls.

LAND FEATURES AFFECTING USE	CAPABILITY CLASS				
	1	2	3	4	5
SLOPE (1)	Less than 3%	3% to 5%	5% to 8%	8% to 12%	More than 12%
FLOODING (2)	None	5-10 times in 100 years	10-20 times in 100 years	20-100 times in 100 years	More than once in 1 year
BOULDERS (Fragments over 250mm on surface) (3)	None	Less than 0.01%	0.01% to 0.05%	0.05% to 1%	More than 1%
ROCK OUTCROP (3)	None	Less than 0.01%	0.01% to 0.05%	0.05% to 1%	More than 1%
SITE DRAINAGE (4)	Well drained	Moderately well drained	Imperfectly drained, Excessively drained, well	Poorly drained	Very poorly drained
DEPTH TO SEASONAL WATER TABLE	More than 30 cm	25 cm to 30 cm	20 cm to 25 cm	15 cm to 20 cm	Less than 15 cm
DEPTH TO HARD ROCK (7)	More than 60 cm	50 cm to 60 cm	40 cm to 50 cm	30 cm to 40 cm	Less than 30 cm
STONES (Fragments 75mm to 250mm in soil profile)	Less than 1%	1% to 5%	5% to 10%	10% to 25%	More than 25%
GRAVEL (Fragments 2mm to 75mm in soil profile)	Less than 1%	1% to 5%	5% to 10%	10% to 25%	More than 25%
DEPTH OF TOPSOIL (10)	More than 20 cm	10 cm to 20 cm	8 cm to 10 cm	5 cm to 8 cm	Less than 5 cm
TOPSOIL TEXTURE (11)	SL, L, ORG-L	LS, CL, LFS	ORG-C C, LC, MC, S	-	-

**LAND CAPABILITY FOR THE EROSION RISK ASSOCIATED WITH GRAZING:** Grazing cattle and sheep, on largely unimproved pastures which may include volunteer improved grass and clover species, both annual and perennials: occasional topdressing with superphosphates: fencing for stock control: control of rabbits by 1080 poisoning, (Rainfall Zone 500-750 mm p.a.).

LAND FEATURES AFFECTING USE	CAPABILITY CLASS				
	1	2	3	4	5
SLOPE (1)	Less than 10%	10% to 20%	20% to 30%	30% to 45%	More than 45%
FLOODING (2)	None	-	-	-	More than once in 1 year
BOULDERS (Fragments over 250mm on surface) (3)	Less than 2%	2% to 15%	15% to 25%	25% to 40%	More than 40%
ROCK OUTCROP (3)	Less than 2%	2% to 15%	15% to 25%	25% to 40%	More than 40%
SITE DRAINAGE (4)	Well drained, moderately well drained	Imperfectly drained	Excessively well drained, poorly drained	Very poorly drained	-
DEPTH TO HARD ROCK (7)	More than 100 cm	60 cm to 100 cm	30 cm to 60 cm	15 cm to 30 cm	Less than 15 cm
DEPTH TO TOPSOIL (10)	More than 15 cm	10 cm to 15 cm	8 cm to 10 cm	5 cm to 8 cm	Less than 5 cm
TOPSOIL TEXTURE (11)	L, SL, CL, FSL, ORG-L	SCL, LS, LFS	C, LC, MC, ORG-C	-	S
GRAVEL (Fragments 2 mm to 75 mm in soil profile)	Less than 5%	5% to 10%	10% to 20%	20% to 40%	More than 40%

**LAND CAPABILITY RATING FOR SECONDARY ROADS:** Areas capable of being used for the construction of roads with sealed surfaces for light vehicles and with drainage and kerbing. It is assumed that commonly used earthmoving equipment is available.

LAND FEATURES AFFECTING USE	CAPABILITY CLASS				
	1	2	3	4	5
SLOPE (1)	Less than 4%	4% to 8%	8% to 12%	12% to 25%	More than 25%
FLOODING (2)	None	-	-	Less than once in 10 years	More than once in 10 years
BOULDERS (Fragments over 250mm on surface) (3)	Less than 0.1%	0.1% to 0.5%	0.5% to 5%	5% to 30%	More than 30%
ROCK OUTCROP (3)	Less than 0.5%	0.05% to 0.1%	0.1% to 1%	1% to 5%	More than 5%
SITE DRAINAGE (4)	Excessively well drained, well drained	Moderately well drained	Imperfectly drained	Poorly drained	Very poorly drained
SHRINK – SWELL POTENTIAL (5)	Less than 4%	4% to 12%	12% to 20%	More than 20%	-
DEPTH TO SEASONAL WATER TABLE	More than 150 cm	90 cm to 150 cm	60 cm to 90 cm	30 cm to 60 cm	Less than 30 cm
UNIFIED SOIL GROUP (SUB-SURFACE) (6)	GP, GW, SW, GC	SM, SC, GM	SP, CL, CH, MH, ML	OL, OH	Pt
DEPTH TO HARD ROCK (7)	More than 100 cm	75 cm to 100 cm	40 cm to 75 cm	15 cm to 40 cm	Less than 15 cm
STONES (Fragments 75mm to 250mm in upper 50cm of soil profile)	Less than 10%	10% to 20%	20% to 40%	40% to 70%	More than 70%

**LAND CAPABILITY RATING FOR ON-SITE SEPTIC TANK EFFLUENT DISPOSAL:** Areas capable of being used for on-site soil absorption of all-waste septic tank effluent from a single family dwelling.

LAND FEATURES AFFECTING USE	CAPABILITY CLASS				
	1	2	3	4	5
SLOPE (1)	0 to 5%	5% to 8%	8% to 15%	15% to 30%	More than 30%
FLOODING (2)	None	-	-	Less than once in 25 years	More than once in 25 years
BOULDERS (Fragments over 250mm on surface) (3)	Less than 0.02%	0.02% to 0.2%	0.2% to 2%	2% to 10%	More than 10%
ROCK OUTCROP (3)	Less than 0.01%	0.01% to 0.1%	0.1% to 1%	1% to 5%	More than 5%
SITE DRAINAGE (4)	Excessively drained, well drained	Moderately well drained	Imperfectly drained	Poorly drained	Very poorly drained
SHRINK – SWELL POTENTIAL (5)	Less than 4%	4% to 12%	12% to 20%	More than 20%	-
DEPTH TO SEASONAL WATER TABLE	More than 150 cm	120 cm to 150 cm	90 cm to 120 cm	60 cm to 90 cm	Less than 60 cm
DEPTH TO ROCK OR IMPERVIOUS LAYER (7)	More than 200 cm	150 cm to 200 cm	100 cm to 150 cm	75 cm to 100 cm	Less than 75 cm
STONES (Fragments 75mm to 250mm in soil profile)	Less than 2%	2% to 10%	10% to 30%	30% to 60%	More than 60%
PERMEABILITY (8)	Faster than 1.0m/day	1.0m/day to 0.3m/day	0.3m/day to 0.1m/day	0.1m/day to 0.02m/day	Slower than 0.02m/day
GRAVEL (Fragments 2 mm to 75 mm in soil profile)	Less than 5%	5% to 20%	20% to 40%	40% to 75%	More than 75%

**LAND CAPABILITY RATING FOR EARTHEN DAMS:** Areas capable of being used for the construction of small water storages with earthen embankments.

LAND FEATURES AFFECTING USE	CAPABILITY CLASS				
	1	2	3	4	5
SLOPE (1)	2% to 5%	5% to 10%	0-2% or 10-15%	15% to 20%	More than 20%
FLOODING (2)	None	-	-	Less than once In 25 years	More than once in 25 years
BOULDERS (Fragments over 250mm on surface) (3)	Less than 0.05%	0.05% to 0.1%	0.1% to 1%	1% to 5%	More than 5%
ROCK OUTCROP (3)	Less than 0.02%	0.02% to 0.05%	0.05% to 0.5%	0.5% to 2%	More than 2%
SHRINK – SWELL POTENTIAL (5)	Less than 4%	4% to 12%	12% to 20%	More than 20%	-
UNIFIED SOIL GROUP (SUB-SURFACE) (6)	GC, GM, SC	SM, CL (PI<15)	CL (PI>15) ML, CH	OL, MH, OH	SP, SW, GP, GW, Pt
DEPTH TO HARD ROCK (7)	More than 300 cm	200 cm to 300 cm	150 cm to 200 cm	80 cm to 150 cm	Less than 80 cm
STONES (Fragments 75mm to 250mm in construction material)	Less than 5%	5% to 20%	20% to 50% 5%	50% to 75%	More than 75%
PERMEABILITY (8)	Slower than 0.1 I/m <sup>2</sup> day	0.1 to 1 I/m <sup>2</sup> day	1 to 5 I/m <sup>2</sup> day	5 to 10 I/m <sup>2</sup> day	Faster than 10 I/m <sup>2</sup> day
DISPERSABLE CLAY (9)	2% to 6%	6% to 10%	10% to 16%	More than 16% or less than 2%	-
DEPTH OF TOPSOIL (10)	10 cm to 25 cm	25 cm to 50 cm	20 cm to 100 cm 0 to 10 cm	100 cm to 200 cm	More than 200 cm
THICKNESS OF CONSTRUCTION MATERIAL	More than 200 cm	100 cm to 200 cm	75 cm to 100 cm	30 cm to 75 cm	Less than 30 cm

**LAND CAPABILITY FOR SHALLOW EXCAVATIONS:** Areas capable of being used for excavations for level construction sites and for trenches to a depth of 2 metres. It is assumed that commonly used earthmoving equipment is available.

LAND FEATURES AFFECTING USE	CAPABILITY CLASS				
	1	2	3	4	5
SLOPE (1)	Less than 2%	2% to 5%	5% to 10%	10% to 25%	More than 25%
FLOODING (2)	None	-	-	Less than once in 10 years	More than once in 10 years
BOULDERS (Fragments over 250mm on surface) (3)	Less than 0.1%	0.1% to 1%	1% to 5%	5% to 30%	More than 30%
ROCK OUTCROP (3)	Less than 0.05%	0.05% to 0.1%	0.1% to 0.2%	0.2% to 1%	More than 1%
SITE DRAINAGE (4)	Excessively well drained, well drained	Moderately well drained	Imperfectly drained	Poorly drained	Very poorly drained
DEPTH TO SEASONAL WATER TABLE	Deeper than 200 cm	150 cm to 200 cm	120 cm to 150 cm	90 cm to 120 cm	Shallower than 90 cm
UNIFIED SOIL GROUP (SUB SURFACE) (6)	CL (PI<15), GC, GM, SC	ML, SM, CL (PI>15), OL	GW, SW	GP, SP, CH, OH	Pt
DEPTH TO HARD ROCK (7)	More than 200 cm	150 cm to 200 cm	120 cm to 150 cm	80 cm to 120 cm	Less than 80 cm
STONES (Fragments 75mm to 250mm in upper 50 cm of soil profile)	Less than 10%	10% to 20%	20% to 40%	40% to 70%	More than 70%

## Notes

- (1) **SLOPE:** Downgrade by one class in slope failure hazard areas.
- (2) **FLOODING:** Upgrade by one class if floods are low velocity, shallow and easily diverted with banks. For septic tanks and building foundations make no such alteration.
- (3) **BOULDERS AND ROCK OUTCROP:**
  - 0.02% is 1m<sup>2</sup> per 5000m<sup>2</sup>
  - 0.05% is 1m<sup>2</sup> per 2000 m<sup>2</sup>
  - 0.1% is 1m<sup>2</sup> per 1000m<sup>2</sup>
  - 0.5% is 1m<sup>2</sup> per 200m<sup>2</sup>
  - 1% is 1m<sup>2</sup> per 100m<sup>2</sup>
  - 2% is 1m<sup>2</sup> per 50m<sup>2</sup>
  - 5% is 1m<sup>2</sup> per 20m<sup>2</sup>
- (4) **SITE DRAINAGE:** For secondary roads up grade by one class if construction is carried out when conditions are dry.
- (5) **SHRINK-SWELL POTENTIAL:** Determined for material to be used for bank construction.
- (6) **UNIFIED SOIL GROUP:** This is determined at the sides and base of excavation. Topsoil is ignored.
- (7) **DEPTH TO HARDROCK:** Material which cannot be excavated by normal earthmoving equipment.
- (8) **PERMEABILITY:** This test is carried out in material at the expected depth of the base of the excavation. A rate of 10 l/m<sup>2</sup>-day is approximately 0.5cm drop in head per hour in a 5cm diameter test hole after thorough wetting. Values are based upon determination of hydraulic conductivity, "K". Where K exceeds 0.6m/day, risk of polluting water bodies must be considered.
- (9) **DISPERSIBLE CLAY:** Determined for material to be used for bank construction.
- (10) **DEPTH OF TOPSOIL:** Material to be stockpiled for re-spreading.
- (11) **TOPSOIL TEXTURE:** Symbols are those used in; Northcote K.H. (1979). "A Factual Key for the Recognition of Australian Soils". 4<sup>th</sup> Edn. Rellim Tech. Publ. Glenside, S.A.

## Glossary

**ACCORDANCE OF SUMMITS:** A series of hill tops or ridge crests that are of similar elevation. Accordance indicates that these summits are probably remnants of an earlier planar surface that has undergone dissection.

**ALLUVIAL PLAIN:** A level plain that borders a stream and is subject to flooding; also referred to as a flood plain.

**ALLUVIUM:** Material such as sand, silt or clay deposited on land from flowing water.

**AMORPHOUS:** A term formally used to describe a body of rock occurring in a continuous mass, without division into parts.

**ANNUAL WEEDS:** Undesirable short lived plants with shallow root systems.

**ANTICLINORIA:** A composite fold structure of many anticlines and synclines where the boundaries are arched upwards.

**ANTICYCLONE:** An atmospheric pressure distribution in which there is a high central pressure relative to the surroundings. It may alternatively be called a "high".

**ANTIMONY:** A hexagonal mineral, the native metallic element Sb. It is brittle and commonly occurs in silvery or tin-white granular, lamellar, or shapeless masses.

**APLITE:** A light-coloured igneous rock with a fine, even-grained texture, free from dark minerals, usually found as dykes.

**AQUIFERS:** Layer of rock or soil able to hold or transmit much water.



**ATMOSPHERIC INSTABILITY:** The atmosphere is termed unstable if a parcel of air, when moved from its original position by an external force, continues to move further from its original position after the force has been removed. The atmosphere is termed stable if the atmosphere returns to its original position after the force has been removed.

**ATTERBERG LIMITS:** In a sediment, the water-content boundaries between the semi-liquid and plastic states (known as the liquid limit) and between the plastic and semi-solid state (known as the plastic limit).

**AUREOLE:** A zone of variable width (a few metres to several kilometres) surrounding a major intrusive body such as a batholith, where the pre-existing rock has been altered due to the heat and pressure of the intrusion. Various grades of metamorphic alteration occur in the aureole, the degree of change diminishing away from the intrusive contact.

**BARAGWANATHIA LONGIFOLIA:** Large, well-preserved specimens of stems and leaves of this land plant fossil are found in Early Devonian shales of the Humevale Formation in the Yea district. It is regarded as one of the earliest known vascular land plants.

**BASALT:** Dark-coloured, fine-grained extrusive igneous rock.

**BATHOLITH:** A very large body of intrusive igneous rock (up to hundreds of kilometres in length) that originally solidified under the earth's surface and has been revealed by uplift and erosion.

**BEDROCK:** A general term for the rock, usually solid, that underlies soil or other unconsolidated, superficial material.

**BIOTITE:** An important rock-forming mineral of the mica group.

**BLEACHED HORIZONS:** Horizons or layers within the profile which are very much paler than adjacent layers.

**BOTRYOIDAL:** Having the form of a bunch of grapes, minerals with a surface of spherical shapes.

**CALCAREOUS:** Implies that a considerable percentage (up to 50%) of the rock is calcium carbonate.

**CARBONACEOUS:** Refers to a sediment containing organic matter.

**CAULDRON SUBSIDENCE:** A roughly circular area of subsidence now filled with lava which was extruded from bounding faults. The subsidence of the area results from the depletion of an underlying magma chamber.

**CHERT:** A hard, extremely dense, indistinctly crystalline sedimentary rock consisting predominantly of silica. Flint is essentially synonymous.

**CLAY:** As a soil: mineral particles in the soil, having a diameter less than 0.002mm. As a soil texture class: soil material that is 40% or more clay, less than 45% sand, and less than 40% silt.

**CLIMATOLOGICAL:** Pertaining to climate. Climate can be thought of as the average weather and the variability of the weather at a locality or a region.

**COALESCED FANS:** A series of overlapping foot-slope deposits that form a continuous apron of sediment at the base of an escarpment.

**COARSE TEXTURED (LIGHT TEXTURED) SOIL:** Sand or loamy sand.

**COLLUVIUM:** A deposit of rock fragments and soil material accumulated near the base of slopes as a result of gravitational action.

**CONCRETION:** A local concentration of chemical compound, such as calcium carbonate or iron oxide, in the form of a grain or nodule of varying size, shape, hardness, and colour.

**CONFLUENCE:** Stream joining another, flowing together, uniting.

**CONVECTION:** A method of heat transfer within the atmosphere which is of fundamental importance in the vertical transfer of heat and water vapour.

**COVER FACTOR:** A measure of the protection from wind or water erosion given to the soil by plants or plant remains.

**COVERED PLAIN:** A flat flood plain incorporating slow migrating deep alluvial channels. The plain comprises small flats, depressions, banks, relic levees and terraces. Areas are usually waterlogged.

**CRESTS:** Smooth, rocky and gravelly convex to essentially flat crests which stand above all other terrain elements. Surface character generally dictated by geology and individual slopes.

**CYCLONES:** An atmospheric pressure distribution in which there is a low central pressure relative to the surroundings. It may alternatively be called a "low" or "depression".

**DEPRESSION:** See "cyclone".

**DIP-SLIP FAULT:** A normal fault with a vertical dislocation.

**DISPERSIBILITY:** The dissociation of clay particles from a soil sample immersed in water.

**DISSECTED TERRAIN:** A complex topographic unit comprising of escarpments, precipitous slopes, steep slopes, moderate slopes, dissected hills, and incised drainage courses.

**DIURNAL:** The diurnal variation of a meteorological element is its systematic change within the course of a (solar) day.

**DRAINAGE LINE:** The course or channel of a clearly defined stream in a drainage complex.

**DRY SHEEP EQUIVALENT:** A common unit for expression of feed requirements of various classes of livestock, eg. 1 wether = 1 D.S.E., 1 cross-bred ewe and lamb = 2 D.S.E., 1 beef cow and calf = 14 D.S.E.

**DRYLAND SALINITY:** A process where, without irrigation, natural salts within the soil accumulate, affecting vegetative growth. The process is believed to be caused by increased water movement from higher land following removal of vegetation.

**DUNES:** A single or complex of moderately inclined to very steep sand ridges (or hillock) built up by the wind.

**DUPLEX SOIL:** A soil in which there is a sudden change in texture in the profile.

**DYKE:** A relatively small, tabular or sheet-like body of intrusive igneous rock, ranging from a few centimetres to tens of metres thickness, generally steeply inclined, and cutting across older rock formations.

**DYKE SWARM:** Numerous parallel or radiating dykes, usually centred around major intrusions or igneous complexes, (in this study the Marysville Igneous Complex).

**EMBEDDED LOW PRESSURE SYSTEMS:** Low pressure systems which are embedded in a predominantly westerly airstream generally situated to the south of the continent or in the southern part of the continent.

**EROSION:** The weathering away of the land surface by running water, wind, ice and other agents such as gravitational creep.

**FACTUAL KEY:** An alpha-numeric coding designated to a profile to distinguish it from other soil forms.

**FAN:** A large gently inclined to level landform with radial slope lines inclined away from a point, resulting from aggrading by channelled often braided stream flow.

**FERRUGINOUS:** Pertaining to or containing iron. Refers to a rock having a rusty colour due to the presence of ferric oxide.

**FINE TEXTURED (HEAVY TEXTURED) SOIL:** Sandy clay, silty clay and clay.

**FLAT PLAIN:** A large non-sloping, level land form which lacks any associated land form elements, however minor stream channels may occur.

**FLOOD RISK:** Precise data is difficult to obtain on the frequency of flood events and the classes given here were determined by observations on land form, catchment geometry and soil types which reflect recent sediment deposition.

Flood Class	Estimated Return Period
Nil	More than 100 years
Low	25 to 100 years
Moderate	5 to 25 years
High	1 to 5 years
Very High	Seasonal flooding

**FLOODING:** The temporary covering of soil with water from over flowing streams and runoff from adjacent slopes.

**FLYSCH:** A sequence of sedimentary strata dominated by thin layers of dark shale and siltstone, and with thicker beds of greywacke (a dark coloured sandstone containing abundant clay, rock fragments, and other mineral grains).

**FOOT HILLS:** Lower slopes which form finger-like projections off mountainous and hilly terrain. They are typically smooth and rounded with gentle gradients of less than 15%.

**FOOT SLOPES:** Moderate to very gently inclined smooth waning slopes off hilly and mountainous terrain. The units are essentially formed from erosional creep. Gradients are usually less than 10% typically less than 5%.

**FRONT:** A transition zone separating air masses of different characteristics (temperature, moisture, etc.). Is usually associated with a band of cloud.

**GENERAL DESCRIPTIONS:** A brief statement given to indicate the predominant conditions which characterise each map unit.

**GENTLE SLOPES:** Sloping terrain with gradients ranging from 3%-10%. Generally, planar non-undulating areas which may be smooth or rocky depending upon geology in specific areas.

**GEOSYNCLINE:** An elongate marine basin that has been filled by a greater thickness of sediment and subsequently uplifted, folded, and intruded by granitic magmas.

**GRADATIONAL SOIL:** A soil in which there is a gradual change in texture down through the soil profile.

**GRANITE:** A light-coloured plutonic rock in which quartz constitutes 20 to 60% of the light-coloured minerals and in which the ratio of alkali feldspar to total feldspar is between 35 and 90%.

**GRANODIORITE:** Similar in appearance to a granite, but contains more plagioclase feldspar at the expense of alkali feldspar.

**GRAVEL:** Rounded or angular fragments of rock ranging from 2 mm to 75 mm in diameter.

**GRAYWACKE:** A dark coarse-grained sandstone of poorly sorted fragments of quartz and feldspar plus finer-grained material. Thinner layers show marked graded bedding. It generally requires an

environment in which erosion, transportation, deposition, and burial are so rapid that complete chemical weathering does not occur, as in an orogenic belt, where sediments derived from recently elevated source areas were 'poured' into a geosyncline.

**GREENSTONE:** Basic igneous rocks, predominantly lavas.

**GULLY EROSION:** Erosion of soil or soft rock material by running water that forms distinct channels that are larger and deeper than rills and that usually carry water only during and immediately after heavy rain.

**HIGH RISE:** Smooth rounded isolated high rises in flat or undulating terrain with relative relief up to 20 m and sideslopes to 10%.

**HILLS:** Isolated high element with gently inclined to precipitous slopes. Relief is from 90-300 m, typically 100 m. Units are continually being eroded by colluvial wash. Typical associated elements include crests, moderate slopes, foot slopes and fans.

**HORTICULTURE:** Production of fruit and vegetables.

**HUMIDITY:** Moisture content of the atmosphere.

**IGNEOUS:** A rock or mineral that has solidified from molten material. 'Igneous' rocks constitute one of the three main classes into which rocks are grouped (that is, igneous, metamorphic, sedimentary).

**INCIPIENT SALTING:** Salt levels are not toxic, but affect less tolerant plant species.

**INFILTRATION:** The downward entry of water into the soil.

**INTAKE AREAS:** That part of the catchment where water infiltrates into the underlying parent material.

**INTERPOLATION:** Mathematical method for estimating the value at a location between two point values.

**LACUSTRINE:** Pertaining to, produced by, or formed in a lake.

**LADDER VEINS:** A series of deposits in traverse parallel fractures formed along foliation planes perpendicular to the walls of a dyke during cooling, also along shrinkage joints in basalt.

**LAND COMPONENT:** Is an area of land, distinct from surrounding terrain, having an integrated assemblage of particular classes of geological material landform, soil and native vegetation.

**LAND USE DETERMINATION:** The determining of how land in a proclaimed catchment, may best be used in the interests of the public and of the water supply under the provisions of Section 23(i) of the Soil Conservation and Land Utilisation Act 1958.

**LAVA:** A general term for a molten extrusive – also for the rock that is solidified from it.

**LEACHING:** The removal of soluble material from the soil by water percolation.

**LEVEES:** Long low smooth ridge-like topography immediately adjacent to a stream or river, having been built up by over-bank flow.

**LIGHT TEXTURE SOIL:** Sand and loamy sand.

**LIQUID LIMIT:** See under Atterberg Limits

**LOAM:** Soil material that is 7 to 27% clay particles, 28 to 50% silt particles and less than 52% sand particles.

**LOW HILLS:** Low (rounded) hills rising to a relative relief of 50 m with gentle to moderately inclined smooth slopes. These topographic units incorporate crests, slopes and minor drainage courses. Side slopes to 8%.

**LOW RISE:** Smooth rounded isolated low rises in flat or undulating terrain with relative relief up to 9 m and sideslopes with gradients of 2%-3%.

**LUNETTE:** An elongated, gently curved, low ridge built up by wind on the margin of a lake or depression. Slopes towards the lake are steeper than those of the outer slope.

**MAGMA:** Hot, mobile rock material that originates in the lower crust and outer part of the earth's mantle (down to 250 kilometres below the surface). Solidification below the surface forms intrusive bodies (plutons, batholiths, dykes), while an eruption of mobile magma at the surface (then called lava) gives rise to volcanism.

**MAP UNIT:** The name and mapping symbol shown for each recognised type of land.

**MEDIAN:** Is the value which cuts off half of a set of figures which is ranked in increasing numerical order. The median is often close in value to the arithmetic average. See percentile.

**METAMORPHIC ROCK:** Rock of any origin altered by heat and pressure from an intrusive flow (below the zone of weathering), in mineralogical composition, chemical composition, or structure.

**MODERATE SLOPES:** Smooth or rocky slopes which typically show slope gradients from 10% - 30%. Units with this land form are practically situated above foot slopes and foot hills but below the crests.

**MOTTLING SOIL:** Irregular spots of different colours that vary in number and size. Mottling generally indicates poor aeration and impeded drainage.

**MYXOMATOSIS:** A viral disease which kills rabbits. The virus is spread by vectors such as mosquitoes and fleas.

**OPEN DEPRESSIONS:** Low smooth open drainage depressions with gentle side slopes and flat (often sandy) floors. Some very minor incised drainage courses may occur.

**PED:** An individual natural soil aggregate.

**PENEPLAIN:** A level to gently undulating land form pattern with very low relief and sparse slowly migrating non directional stream channels.

**PERCENTILE:** The N percentile of a set of figures is the value which cuts off N percent of the figures if they were ranked in increasing numerical order. The median is equivalent to the 50 percentile.

**PERENNIAL GRASSES:** Plants of the Family Gramineae, which are long lived, provide all year round ground cover and are generally deep rooted.

**PERMEABILITY:** The ease with which liquids pass through a soil or layer of soil. Since different soil horizons vary in permeability, the particular horizon under question is often designated.

**PERMEABILITY CLASS:** This indicates the ability of a soil to absorb and transmit water. There are often large variations in permeability within a map unit. The classes quoted are the most commonly recorded values as determined by maintaining a constant head at 20 cm in a saturated 5 cm diameter auger hole 50 cm deep.

Permeability Class	Approximate Percolation Rate
Very good	> 1.0 m/day
Good	1.0 to 0.5 m/day
Fair	0.5 to 0.2 m/day
Poor	0.2 to 0.05 m/day
Very poor	< 0.05 m/day

**pH SOIL:** A measure of the acidity or alkalinity of the soil expressed as the negative logarithm of the hydrogen-ion activity of a soil. A pH of 7.0 is neutral, higher values indicate increasing alkalinity and lower values indicate increasing acidity.

**PHENOMENA:** A general term for fog, frost, hail, snow, thunderstorms, thunder heard, duststorms, mist, haze, strong wind or gale.

**PHOTO-INTERPRETATION:** The art of identifying and describing objects imaged on a photograph.

**PIEZO-ELECTRIC QUARTZ:** Crystals which can develop a potential difference under particular circumstances.

**PLAIN:** Any flat area, large or small, having few if any prominent surface irregularities.

**PLUTON:** A general term given to a large body of igneous rock that solidified under the earth's surface and has been subsequently exposed by erosion and uplift.

**PLUVIOGRAPH:** A meteorological instrument used for continuous monitoring of rainfall.

**PORPHYRITIC:** Pertaining to the texture of an igneous rock in which larger crystals (phenocrysts) are set in fine groundmass.

**PROCLAMATION:** A water supply catchment area is proclaimed under the provisions of Section 5 of the Land Conservation Act 1972 and Section 22(i) of the Soil Conservation and Land Utilisation Act 1958.

**PROFILE, SOIL:** A vertical section of the soil extending through all its horizons and into the parent material.

**PYROCLASTIC:** Pertaining to a rock composed of broken fragments derived from a pre-existing rock by volcanic explosion or aerial explosion from a volcanic vent.

**RADIATION:** Electromagnetic energy emitted by the sun measured at the earth's surface.

**REAFFORESTATION:** The planting of trees over large areas to replicate a natural forest.

**RHYOLITE:** A group of extrusive igneous rocks generally porphyritic and exhibiting flow textures (bands) with phenocrysts of quartz and alkali feldspar in a glassy groundmass; the extrusive equivalent of granite.

**RING\_BARKING:** Cutting of bark around the entire circumference of a tree to prevent translocation of nutrients and effectively killing the tree.

**SALTING:** Harmful accumulation of salts in the soil.

**SAND:** As soil particles with a diameter range of 0.02-2 mm. As a soil textural class: Soil material containing 85% or more of sand.

**SEASONAL WATER TABLE:** Is the depth at which water persists for substantial periods of the year and where soil aeration is adversely affected by waterlogging.

**SEDIMENTARY ROCK:** A rock resulting from the consolidation of loose sediment deposited from suspension or precipitated from solution.

**SELF MULCHING SOIL:** A soil in which the surface layer becomes so well aggregated that it does not crust and seal under the impact of rain, but instead serves as a surface mulch upon drying.

**SHRINK-SWELL POTENTIAL:** Shrink-swell potential or Linear Shrinkage is related to the amount of swelling clays that are present in a soil. Class limits for shrink-swell potential are:

Shrink-swell Potential	Linear Shrinkage
Low	Less than 4%
Moderate	4% to 12%
High	12% to 20%
Very high	More than 20%

**SILT:** As a soil: mineral particles having a diameter in the range of 0.002-0.02 mm. As a soil textural class of soil material, containing 8% or more of silt.

**SITE DRAINAGE:** The ease with which will leave a site after heavy rainfalls. It is largely determined by slope, surface cover, and soil infiltration rate:

- very rapid (very large proportion of water runs off; very small proportion enters soil. Water runs off as fast as it is added. Soils usually have steep to very steep slopes and low infiltration rates).
- rapid (large proportion of water runs off; small proportion enters soil. Water runs off nearly as fast as it is added. Soils have moderate to steep slopes and low infiltration rates.)
- moderate (free water on surface for short periods only.)
- slow (free water on surface for significant periods. Soils either nearly level, gently sloping or relatively porous.)
- very slow – ponding (free water on surface for long periods. Soils usually level or nearly so.)
- transmitting/collecting (drainage lines, lakes or depression areas.)

**SLAKING:** The extent to which a soil particle crumbles when placed in a phial of distilled water for ten minutes:

- none
- slow (few particles break away)
- moderate (steady fall of particles)
- rapid (quick destruction of soil ped)

**SLOPE:** The inclination of the land surface from the horizon.

**SOIL:** The unconsolidated material on the immediate surface of the earth that serves as a natural medium for the growth of land plants.

**SOIL DRAINAGE CLASS:** This is related to soil type, gradient, rainfall and position in the landscape.

Soil Drainage Class	Definition
Well drained	Soils never waterlogged – no reduction in the profile. Usually bright, whole coloured soils in freely draining locations
Moderately well drained	Soils rarely waterlogged except at depth. Fairly bright coloured, moderately permeable with mottling deeper in the profile.
Imperfectly drained	Soils frequently waterlogged at depth – rarely at the surface. Duller coloured soils, often mottled B horizons.
Poorly drained	Seasonally waterlogged often coming close to the surface. Pallid mottled impermeable B horizons. Rootline oxidation in surface layers.
Very poorly drained	Permanently waterlogged or seasonally inundated soils. Grey colours, often with organic surface layers – marshy soils.

**SOIL HORIZON:** A layer of soil approximately parallel to the surface having distinct characteristics produced by soil forming processes.

**A.** Mineral horizons consisting of:

- (i) horizons of organic matter accumulation formed or forming at or adjacent to the surface;
- (ii) concentration of quartz or other resistant minerals of sand or silt size; or
- (iii) horizons dominated by (i) or (ii) above but transitional to an underlying B or C horizon.

**A<sub>2</sub>** Mineral Horizons in which the dominant feature or features is one or more of the following:

**B.** Mineral Horizons in which the dominant feature or features is one or more of the following:

- (i) an alluvial concentration of silicate clay, iron, aluminium, or humus, alone or in combination;
- (ii) a residual concentration of sesquioxides or silicate clays, alone or mixed, that has formed by means other than solution and removal of carbonates or more soluble salts;
- (iii) coating or sesquioxides adequate to give conspicuously darker, stronger, or redder colours than overlying and underlying horizons.

**C.** Mineral horizon or layer, excluding bedrock, that is either like or unlike the material from which the solum is presumed to have formed, relatively little affected by pedogenic processes, and lacking properties diagnostic of A or B but including materials modified by:

- (i) weather outside the zone of major biological activity
- (ii) reversible cementation, development of brittleness, development of high bulk density, and other properties characteristic of frangipans;
- (iii) gleying;
- (iv) accumulation of calcium or magnesium carbonate or more soluble salts;
- (v) cementation by accumulation of calcium or magnesium carbonate or more soluble salts;
- (vi) cementation by alkali-soluble siliceous material or by iron and silica.

**SOIL STRUCTURE:** Concerned with the arrangement of soil particles and may be described in terms of three characteristics:

- (1) Grade, expressing the degree and strength of soil aggregation, structureless (weak, moderate and strong).
- (2) Class, expressing size.
- (3) Form, expressing shape.

**SOIL TEXTURE:** The relative proportion of sand, silt and clay particles in a mass of soil.



**SOLUM:** The upper and most weathered part of the soil profile; the A and B horizons.

**SPURS:** A narrow, steep-sided minor ridge crest trending approximately at right angles to the orientation of a major ridge or divide.

**STEEP SLOPES:** Very steep to precipitous slopes with gradients of > 30%. Generally the areas are rocky and stony and exhibit various degrees of colluvial creep. Escarpments are included in this topographic class.

**STRATIGRAPHY:** The study of layered or stratified rocks (typically sedimentary) to determine the geological history of an area.

**STRIKE-SLIP FAULT:** A normal fault with a horizontal dislocation.

**SWAMPS:** An almost level closed depression which is commonly permanently waterlogged. Landforms are aggraded by wash from adjacent terrain.

**SYNCLINORIA:** A composite fold structure of many anticlines and synclines where the boundaries are in a trough shape.

**TABBERABBERAN OROGENY:** An episode of deformation (uplift, folding and faulting) that effected eastern and central Victoria in the Middle Devonian. This episode marked the end of sedimentation in the Tasman Geosyncline in Victoria.

**TECTONIC UNITS:** An area with a defined set of rock types, and a consistent geological structure pattern (such as folds and faults). The boundaries of the units are usually determined by major faults.

**TOPOGRAPHY:** Shape and steepness of landform within each map unit.

**TROUGH:** A section of a geosyncline with a uniform depositional history, and delineated from adjacent troughs by areas of uplift or faults.

**UNDULATING HILLS:** A series of low hills which are not distinct units. They incorporate saddle elements tying individual hill crests. Units include drainage courses, minor fans, moderate slopes, and foot slopes.

**UNDULATING LOW HILLS:** A complex and continuum of Low Hills with smooth rounded cross sections incorporating narrow drainage courses.

**UNDULATING TERRAIN:** Smooth, wavy low rolling terrain comprising very low rounded crests, very gentle slopes and narrow drainage courses.

**UNFOSSILIFEROUS:** Strata without fossils.

**UNIFIED SOIL GROUP:** Unified Soil Groups are an engineering soil classification based on soil texture and plasticity. They indicate the likely stability of soil for such activities as construction of foundations, roads and embankments. A summary of the classification is given below:

Group Symbol	Typical Names
GW	Well graded gravel, gravel and sand mixtures, little or no fines (less than 5%)
GP	Poorly graded gravel, gravel and sand mixtures, little or no fines (less than 5%)
GM	Silty gravel, gravel, sand and silt mixtures
GC	Clayey gravel, gravel, sand and clay mixtures
SW	Well graded sands, gravelly sands with little or no fines (less than

Group Symbol	Typical Names
SP	5%) Poorly graded sands, gravelly sands with little or no fines (less than 5%)
SM	Silty sands, sand and silt mixtures
SC	Clayey sands, sand and clay mixtures
ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts with slight plasticity
CL	Inorganic clays or low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays, low liquid limit
OL	Organic silts and organic silty clays of low plasticity
MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
CH	Inorganic clays of medium to high plasticity, organic silts
PT	Peat and other highly organic soils

**UNIFORM SOIL:** Soils with small if any textural grade difference throughout the profile.

**UNIVERSAL SOIL LOSS EQUATION (USLE):** A predictive model for determining the amount of soil which may be lost through wind or water erosion from a given area of land under a particular use.

**VERY GENTLE SLOPES:** Sloping terrain with gradients ranging from 1% - 30%. Generally part of a continuum into steeper gradient slopes. Similar in relief to the Gentle Slopes.

**WATERLOGGING CLASS:** Defined upon the presence of a seasonal water table. This phenomenon occurs in areas low in the landscape and where an impermeable soil layer impedes the downward movement of water. Waterlogging classes were determined by observation of depth to water table in saturated soils and by inferences drawn from profile characteristics in soils which were dry when inspected.

Waterlogging classes	Definition
Nil	Water table drops below 1 m within 24 hours after heavy rain.
Temporarily ponded	Local areas of minor ponding persist for several days after rain – little, if any inhibition of plant growth.
Temporarily waterlogged	Water table perches on an impermeable soil layer causing waterlogging which may persist for a week or so after heavy rain. Plant growth may be inhibited to a limited extent.
Seasonally waterlogged	Water table within pasture root zone for about one month after heavy rain. Surface ponding common. Plant growth may be inhibited to some extent.
Water table seasonally at surface	Water at soil surface for several months during winter. Plant growth is inhibited.