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Land Resources Bulletin

Land Resources of the Burnett Region Queensland
Part 3: North Burnett

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and
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Queensland Government
Department of Natural Resources

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This publication is for general distribution. The information in this report is derived from 1:250 0000 scale land resource mapping which is an adequate scale for regional planning purposes. In assessing individual applications for subdivision a detailed assessment of land resources is usually necessary. Explicit evaluation of economic factors such as the size of production units or crop viability have not been included in the land capability assessment as they are not considered relevant to the quality of the land resource (State Planning Policy 1/92).

This report is intended to provide information only on the subject under review. There are limitations inherent in land resource studies, such as accuracy in relation to map scale and assumptions regarding socio-economic factors for land evaluation. Before acting on the information conveyed in this report, readers should ensure that they have received adequate professional information and advice specific to their enquiry.

This publication was prepared by officers of the Department of Natural Resources. It may be distributed to other interested individuals and organisations. National Heritage Trust provided funding for this project and this support is gratefully acknowledged.

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Summary

Land resource information is now available for most of the Upper Burnett River Catchment with the completion of a land resource survey of the North Burnett area. The study area of 1.145 m ha covered the shires of Eidsvold, Monto and Perry. Land systems or areas throughout which there is a recurring pattern of geology, topography, soil and vegetation were mapped at 1:250 000. Within each land system component land units were described in terms of soils, landform attributes and vegetation. One hundred and four land systems were identified and 536 mapping units are shown on the land systems map which accompanies this report. Seven hundred and three land units are described. Land capability classes ranging from class I to VIII as well as the limitations which affect the use of the land are also given for each land unit. A land capability map showing the dominant and subdominant land classes was produced for the 536 mapping units.

The survey was conducted primarily to improve the land resource information available for the area. The information will assist in planning and development of strategies to assist strategic and regional planning, resource management, environmental impact assessment, development control, infrastructure planning and nature conservation for all forms of government and other authorities. It will assist landcare groups and other community groups in developing suitable management strategies to reduce degradation, salinity and erosion.

This land resource information is available in electronic format (Geographical Information System, GIS), printed maps and this report. A database which includes information on each mapping unit is attached to the GIS. Another database which provides information for the 703 land units is also accessible to clients. These databases allow for rapid data manipulation and provide flexibility in the presentation of information such as maps, tables and specific enquiries for a wide range of uses and clients.

The area was divided into eight broad geological groups including: (1) Alluvial systems (occupying 33 007 ha); (2) Deeply weathered, sediments and basic volcanic rocks (31 572 ha); (3) Deeply weathered, duricrusted sediments and acid intrusive rocks (200 849 ha); (4) Basic and intermediate intrusive and extrusive igneous rocks (147 951 ha); (5) Acid volcanic rocks (53 243 ha); (6) Acid intrusive rocks (270 149 ha); (7) Sedimentary rocks (389 509 ha); and (8) Metamorphic rocks (18 729 ha). Further subdivision based on landform and vegetation identified the 104 land systems.

Twenty three land systems have brigalow and associated species or “softwood scrub” species as their dominant vegetation. The other land systems are dominated by a range of eucalypt communities.

Plains, rises, low hills, hills and plateaus are the major landform patterns of the area. Modal slopes vary from level (<1%) on the alluvial plains to steep slopes (32–56%) on the hills. Many plateaus with a range of sizes exist throughout the area.

Soils vary considerably throughout the area due to the wide range of geological formations and landforms. Cracking clays (Vertosols) and non cracking clays (Dermosols) are common on the alluvial plains as well as on the basic and intermediate igneous rocks. These soils are also common on many of the land systems derived from sedimentary rocks.

Deep red soils (Ferrosols) have developed on many of the deeply weathered land systems of geological groups 2 and 3. Ferrosols are also important soils on some of the land systems of group 4.

Sodic duplex soils (Sodosols) and other duplex soils, often with deep subsoils high in sodium (Chromosols) are common on land systems formed on acid intrusive rocks and some land systems derived from sedimentary rocks. These soils are less common on the acid volcanic rocks, the alluvial plain and the metamorphic rocks. Shallow soils (Tenosols and Rudosols) are common on land

systems derived from metamorphic rocks as well as on the crests, upper and midslopes of areas with higher terrain.

About two thirds of the area is land capability class 6 or land well suited to pastoral use. About 14% of the area is suitable either for continuous or occasional cultivation. Less than 4% of the area is regarded as unsuitable for agricultural use of any kind. The major limiting factors influencing the use of the land in the area are plant available water capacity and steep slopes.

Although not extensive, land degradation in varying degrees has occurred in the area. The major forms of degradation are erosion, tree and scrub regrowth, pasture degradation, weed infestations and salinity.

Overgrazing, excessive clearing, inappropriate land use and inadequate erosion protection measures are the major causes of erosion in the area. Degradation by erosion is common on the sodic duplex soils and the overcleared steep slopes.

Salinity is not widespread and affects only small isolated areas. Wattle, eucalypt and brigalow regrowth have occurred in areas where control measures have not been implemented. Pasture degradation has occurred mainly due to poor seasons with subsequent overgrazing. Infestations of creeping lantana are occurring and are severe in some areas. Wire grass has decreased productivity in some areas. Cotton bush has invaded overgrazed pastures especially on sodic duplex soils.

Introduction

The Upper Burnett Region of South East Queensland covers an area of approximately 3 m ha. In 1977, a program by the Department of Primary Industries was initiated to map and describe the land resources of this region due to a paucity of adequate land resource data (Vandersee and Kent, 1983). The region was divided into three subregions, namely South Burnett, Central Burnett and North Burnett.

The land resource surveys of the subregions of South Burnett (Vandersee and Kent, 1983) and Central Burnett (Kent, unpublished) have been completed. The North Burnett area is the subject of this report. These studies have been completed at the reconnaissance level (1:250 000). The location of these subregions is shown in Figure 1. Smith and Kent (1993) mapped the resources of the Inland Burnett District which includes the three subregions at 1:500 000 scale. More detailed studies within the North Burnett area have been completed in the Ceratodus area (Kent *et al.,* 1989) and the Three Moon Creek catchment (Donnollan and Searle, 1998).

Objectives

The major objectives of the project were to:

- undertake a land resource survey at 1:250 000 and produce a land systems map for the area;
- describe the individual land units of the land systems;
- prepare an agricultural land capability map;
- document the information on appropriate databases for use by a range of clients; and
- prepare a technical report.

The information collected for the survey will:

- complete the documentation of land resources of the Upper Burnett River Catchment in order to contribute to the development of sustainable land use for the whole catchment;
- provide appropriate information to assist government departments and other authorities in regional planning;
- assist local government authorities with infrastructure planning and development control;
- assist community groups such as Integrated Catchment Management groups, producer groups, and water advisory committees in developing appropriate management strategies in subcatchments to arrest any form of degradation;
- assist landcare groups and landholders by enhancing the information available for the property management planning process;
- promote the use of resource data by educating the community/landholders/students of the importance of using the resources with appropriate management strategies to develop sustainable farming systems; and
- complement other projects being undertaken in the area.

The land resource information is available in electronic format (Geographical Information System, GIS, databases), printed maps and this report. GIS and database packages can be used to interrogate the digital data to obtain more specific land resource information than this report and the included land system and land capability maps can provide. The digital data as well as hard copies of other maps are available from the Department of Natural Resources in Bundaberg.

The North Burnett area comprises an area of 1.145 m ha and includes the shires of Eidsvold, Monto and Perry. The Burnett Highway is the major road link through the area and passes through or near the major centres of the area, namely Eidsvold and Monto. The Eidsvold–Theodore Road and the

Monto–Mt Perry Road are other important road links through the area. A railway line extends from the south through Eidsvold and Monto to Gladstone.

The total population of the three shires is 4243. Monto is the largest town with a population of 1288. Eidsvold has 519 people and Perry Shire a population of 351.

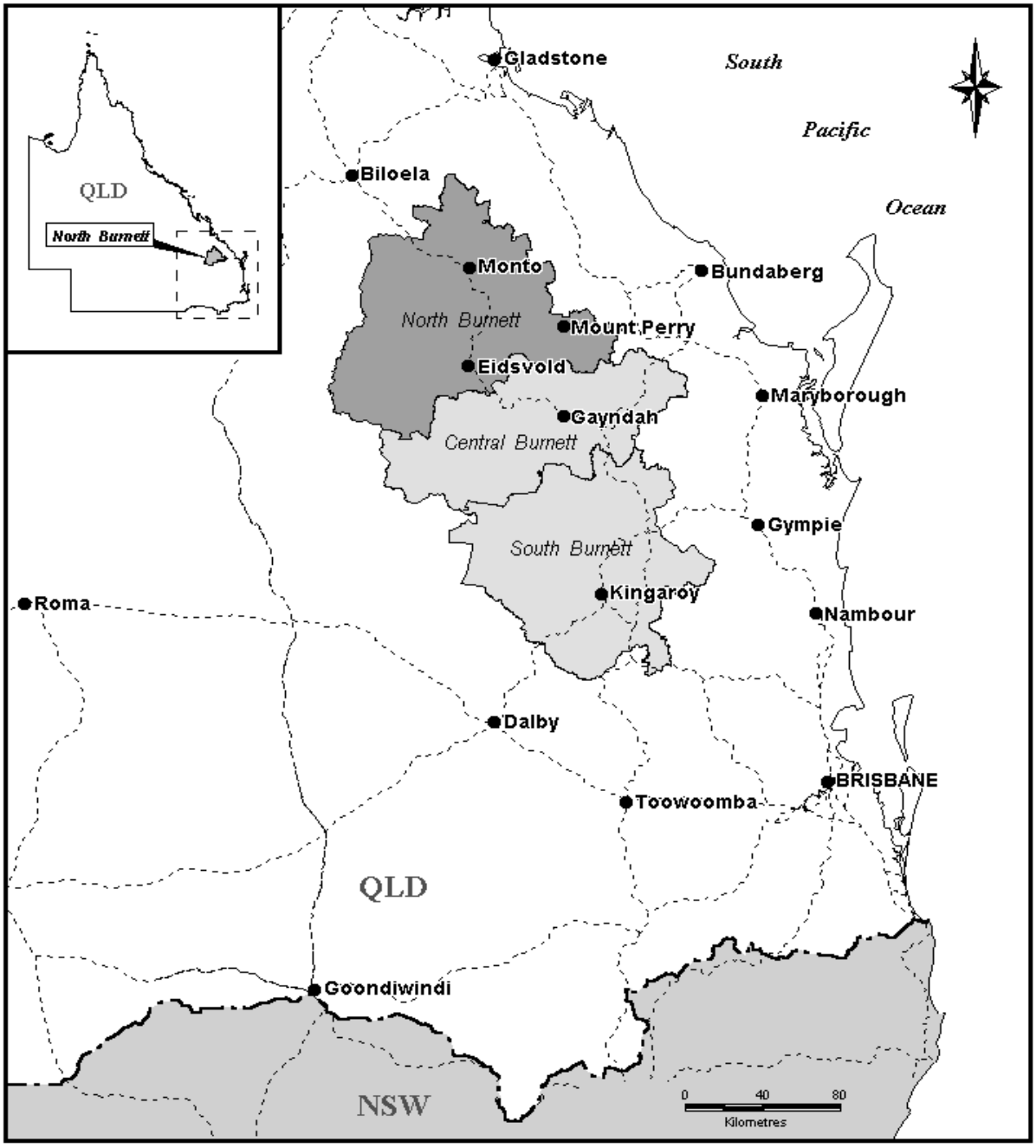

Figure 1. Location of the study area in relation to the Central and South Burnett study areas

Survey methods

The land system approach was used to map and describe the area. A land system is defined by Christian and Stewart (1953) as an area or group of areas throughout which there is a recurring pattern of topography, soils and vegetation. Land systems are composed of one or more land units.

Following a relevant literature review and reconnaissance of the area, aerial photo interpretation was undertaken on 1:83 000 scale black and white photos. Interim land systems based on differences in geology, vegetation and landform were identified from this interpretation.

Detailed descriptions of soils, vegetation and site characteristics were made at over 1100 sites along field traverses to confirm the land system boundaries and to define land units. Site density was greatest in the more intensively farmed areas of the Three Moon Creek catchment where a more detailed survey was undertaken (Donnollan and Searle, 1998). Site density was low in the more inaccessible parts of the survey area. A reliability diagram of the intensity of investigations is shown with the land systems map.

The sites were located using a global positioning system accurate to 30–50 m. A coloured photograph was taken at many of these sites. Information taken at each site was recorded on a computer database. Eighty soil profiles were selected and sampled for the standard suite of chemical analyses. Surface samples from a further eighty five sites were analysed for nutrients.

Land system nomenclature

One hundred and four land systems were identified in the area and a land system map at a scale of 1:250 000 was prepared to show the extent and location of these land systems over 536 mapping units. Individual land systems are briefly described in terms of landform and geology, dominant vegetation and major soils in the reference for the map. For ease of interpretation, the land systems have been grouped into eight broad geological units. Land systems within these broad geological units were further subdivided using landform and vegetation composition.

Landform pattern characterised by relief and modal slope (Table 5 in Speight, 1990) was the major criteria used for subdivision by landform. Land systems with vegetation usually dominated by brigalow or "softwood scrub" species were separated from those dominated by eucalypt species.

Usually the land system was named after the major geological unit on which it occurred. However, other names were selected if the names of the geological units were not appropriate or if the geological unit name was used for other land systems for other surveys.

A number after the name identified those land systems of the same geological formation but with either a different landform, vegetation or suite of soils. Usually lower numbers were assigned to those land systems with brigalow or "softwood scrub" vegetation. Higher numbers identified land systems with greater relief and/or eucalypt vegetation. For instance, five land systems are named *Caswell,* which are formed on a number of early Carboniferous sediment formations, one of the more important ones being the Caswell Creek Group. The undulating hills to rolling hills of *Caswell 1* is dominated by "softwood scrub" forest. The other four land systems support a eucalypt woodland. The landform of *Caswell 2* consists of undulating low hills while *Caswell 3* has the higher relief of rolling low hills. Undulating hills to rolling hills dominate the landscape of *Caswell 4* while *Caswell 5* has rolling hills to steep hills.

Land units

Seven hundred and three land units for the 104 land systems were described in terms of landform element, soils, remnant vegetation and land capability. Soils were described in terms of Northcote (1979) and classified using the new Australian Soil Classification (Isbell, 1996). The limitation subclasses were assessed for each land unit and the land capability classes were subsequently derived for each land unit. An estimate of the percentage of area of the land system occupied by each land unit is also given in the land system description. A two-dimensional diagram is provided to identify the position of the land unit within the land system. A description of the land units of each land system is given in Appendix I.

A land capability map at 1:250 000 derived from the dominant and subdominant land capability class for a particular land system was prepared for each mapping unit. However, a land system often contains more than two classes so care must be taken in using this map. A more accurate land capability assessment for a particular land system can be obtained from the land unit descriptions in Appendix I as well as from the land unit database.

Physical resources

Climate

The climate of the North Burnett area is subtropical with hot summers and mild winters. Mean annual rainfall decreases in a westerly direction. Rainfall is summer dominant and is extremely variable. Mean summer maximum temperatures are about 30°C with winter temperatures about 10°C lower. Average minimum temperatures range from 16 to 19°C in the summer months to 4 to 6°C in the winter months. Evaporation ranges from 6 to 8 mm/day during summer to about 3 mm/day during winter. Climate data has been obtained from Australian Rainman (Clewett *et al.,* 1994).

Rainfall

Rainfall stations within the area are located at Mt Perry, Goondicum, Monto, Narayen and Eidsvold. Record periods range from 90 years at Monto to 114 years at Narayen. Mean annual rainfall is 956 mm at Mt Perry, 752 mm at Goondicum, 734 mm at Eidsvold, 726 mm at Monto and 703 mm at Narayen.

All stations receive similar average annual rainfall except for Mt Perry which receives over 200 mm more. Mt Perry is the most easterly station at longitude 151°39' compared to Narayen, the most westerly station, at 150°51'. In addition a series of mountain ranges occur in the vicinity of Mt Perry which may also account for the higher precipitation at this station. The mean monthly rainfall for the five rainfall stations in the area is shown as histograms in Figure 2.

Rainfall variability is high, for instance the highest annual rainfall at Monto is 1415 mm and the lowest 178 mm. The highest and lowest rainfall figures for Mt Perry are 2207 mm and 397 mm respectively. Standard deviations from the annual rainfall for the stations of Goondicum, Eidsvold and Narayen are about 200 mm.

Temperature

Climate stations at Monto, Kalpowar and CSIRO Narayen Research Station were used as a data source for temperature and evaporation. The monthly, maximum and minimum temperatures are shown for these stations in Figure 3.

The maximum monthly temperatures for Monto and Narayen are similar while those for Kalpowar are slightly lower due to the more easterly location and the higher elevation. The average number of days in which the temperature exceeds 35°C in Monto is six days during both December and January. The highest temperature on record for all stations exceeds 40°C.

The mean minimum temperatures for Monto ranges from 19.1°C in January to 5.1°C in July and for Narayen from 19.5°C to 6.2°C for the same months. Again the mean minimum temperatures at Kalpowar are slightly lower from 18.6°C in December to 3.6°C in July.

Kalpowar is more likely to receive frosts during winter than the other stations. Frosts are more likely to occur in July than in the months of June and August. Heavy frosts, where temperature is less than 0°C, are expected on an average of 7 days, 4 days and 1 day in July for stations Kalpowar, Monto and Narayen respectively.

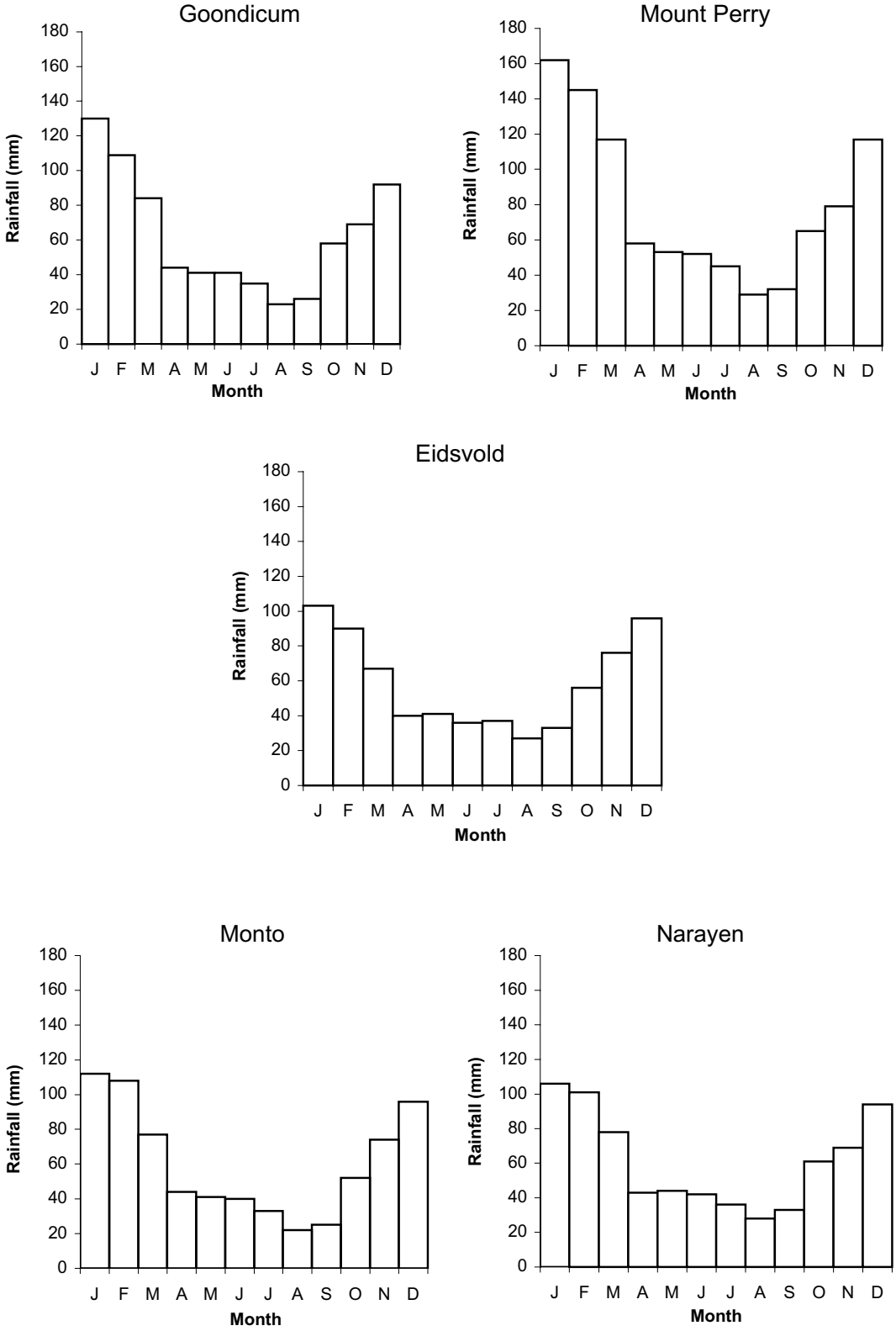

Figure 2. Mean monthly rainfall for stations Goondicum, Mt Perry, Eidsvold, Monto and Narayen in the North Burnett area

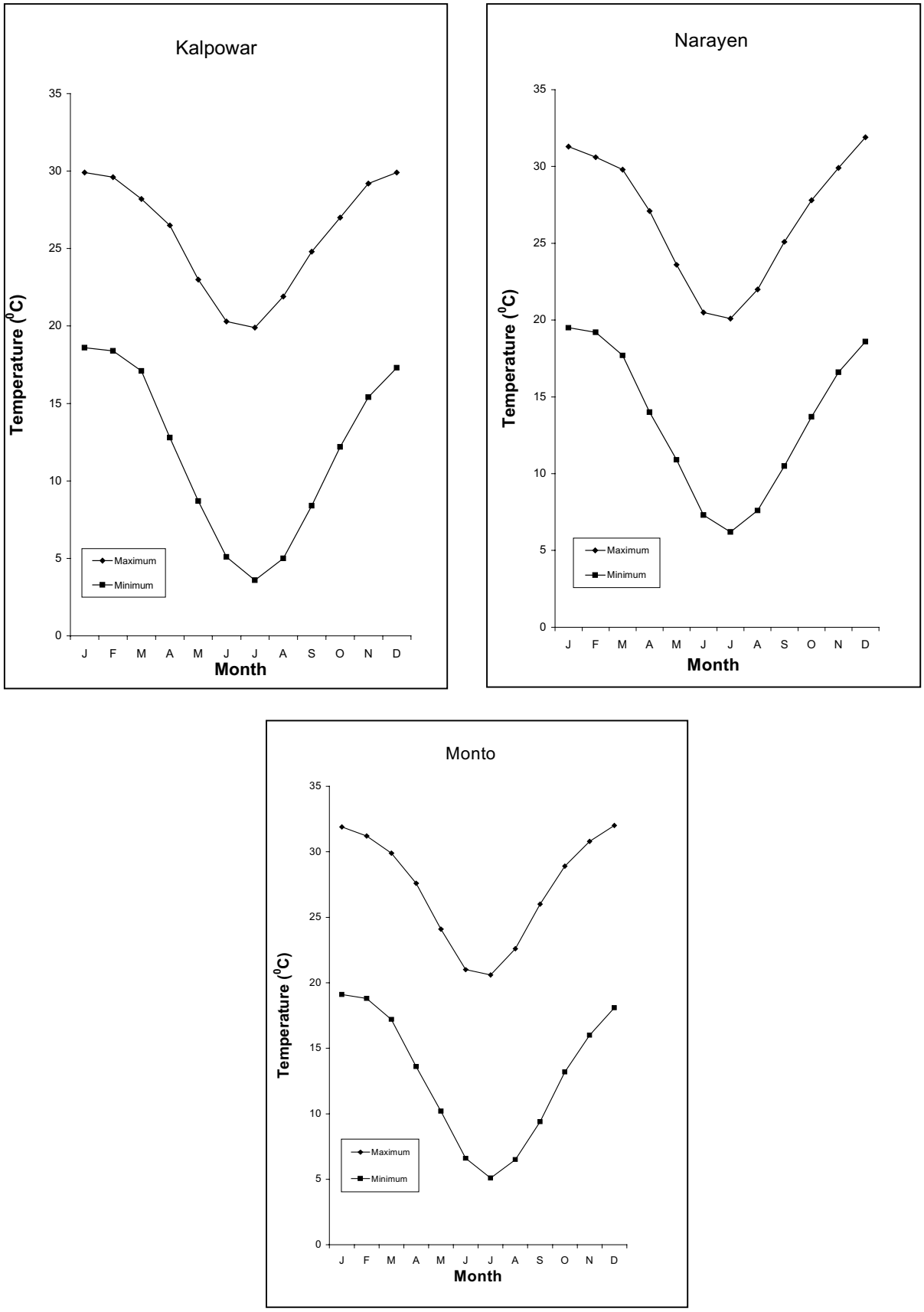

Figure 3. Mean monthly maximum and minimum temperatures for stations Kalpowar, Narayen and Monto in the North Burnett area

Evaporation

Mean monthly pan evaporation in mm/day is shown for the recording stations of Kalpowar, Monto and Narayen in Table 1. Mean pan evaporation exceeds mean rainfall in all months throughout the year. Monto has the highest evaporation rates with Kalpowar the lowest.

Table 1. Average daily pan evaporation (mm/day) for stations Kalpowar, Monto and Narayen

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Kalpowar	6.0	5.2	4.1	3.8	2.9	2.7	2.9	3.7	4.8	5.7	6.6	6.6
Monto	7.4	6.4	5.1	4.3	3.2	3.0	3.3	4.1	5.4	6.7	7.6	8.1
Narayen	6.8	5.8	5.3	4.3	3.3	3.0	3.2	3.8	4.9	6.1	7.1	8.0

Geology

A detailed description of the geological formations including distribution and history, is contained in the reports and accompanying maps covering the Maryborough 1:250 000 sheet (Ellis, 1968) the Monto sheet (Dear *et al.*, 1971) and the Mundubbera sheet (Whitaker *et al.*, 1974).

History

The oldest rocks of the area are considered to be the Wandilla Formation of the Curtis Island Group which may be pre-Devonian and is part of the Yarraman Block. These sedimentary rocks are fine grained, unfossiliferous and appear to represent an offshore, deep, water marine species. This formation occurs in the eastern part of the survey area.

During the Upper Devonian, marine sedimentation on the Yarraman Block was restricted to a narrow shelf along the western margin of the block. This trough represents the initial subsidence along the western side of the Yarrol Basin. Within the trough, a thick sequence of Upper Devonian marine sediments and volcanics of the Kroombit Beds, Channer Creek Beds and Dawes Range Formation were deposited.

At the end of the Devonian, continued folding elevated the western margin of the Yarrol Basin generating further subsidence on the Yarraman Block. Marine conditions prevailed in the Yarrol Basin depositing the Lower Carboniferous Crana Beds, Cania Formation and Caswell Creek Group sediments. With a return to terrigenous conditions during the Upper Carboniferous-Lower Permian the volcanics and volcanoclastics of the Torsdale Beds were deposited. Marine conditions return to the eastern margin of the Yarrol Basin during the Upper Carboniferous depositing the Boiling Creek Group volcanoclastic sediments and limestone. The Goodnight Beds were deposited in a marine environment to the east of the Yarrol Basin.

During the upper Carboniferous, the Moocoorooba Adamellite, Glandore Granodiorite and Kilbeggan Adamellite were emplaced during the uplifting which initiated the Surat Basin to the west. These plutons intrude the Torsdale Beds. During the Lower Permian, the marine to terrestrial Nogo Beds and Narayen Beds consisting of andesites and volcanoclastic sediments were deposited. Terrestrial conditions existed further north along the western margin of the Yarrol Basin with the deposition of the fluvioglacial Youlambie Conglomerate, consisting of conglomerate and siltstone sequences.

After the deposition of the Youlambie Conglomerate the western portion of the Yarrol Basin returned to marine conditions in which the Yarrol Formation limestone and submarine andesitic volcanics of the Owl Gully Volcanics were deposited. Volcanism spread across the Yarrol Basin depositing the

submarine spilitic flows of the Rockwood Volcanics. These basalts interfinger to the east with the fine grained sediments of the Rannes Beds in the deeper marine section of the trough. To the west the Rookwood Volcanics spread out westerly as wedges of Camboon Andesite which become progressively terrestrial.

Sedimentation within the Yarrol Basin had ceased by the late Lower Permian with the initiation of intermittent folding, thrusting and uplift of the Yarrol Basin sediments during the Middle Permian Hunter-Bowen Orogeny. Tenningering Granodiorite, Wolca Granodiorite and Mingo Granite intruded during this tectonic event. Complex faulting associated with a thrusting event occurred during the Upper Permian uplifting the western margin of the Yarrol Basin. Towards the end of the Orogeny, the Mount Perry complex consisting of adamellite and granodiorite intrusions were emplaced. This was followed by two post-orogenic intrusive events. The initial phase was represented by the Eidsvold Complex, Wateranga Gabbro, Yenda Granodiorite, Briggs Granodiorite, Crystalvale Adamellite, Wingfield Adamellite and Goondicum Gabbro during the Upper Permian and the Glassford Complex during the final phase in the Lower Triassic. The second event is represented by late stage intrusions such as the Boolgal Granite emplaced during the Middle Triassic and Hogback Granite during the late Triassic.

Tectonism continued into the lower Triassic which developed several basins including the Mulgildie Basin in which the Lower-Middle Triassic Muncon Volcanics were deposited. Muncon volcanics consist of intermediate and basic volcanics and agglomerate as well as siltstone. Further south, Cynthia Beds consisting predominately of boulder conglomerate and minor rhyolite were deposited. To the east of the Mulgildie Basin, the Aranbanga Beds consisting of rhyolitic, dacitic and andesitic flows and pyroclastics were extruded. To the west, the Mount Eagle Beds consisting of rhyolites were extruded into the Rawbelle batholith. Subsidence of the Mulgildie Basin continued during the Lower-Middle Jurassic in which the Precipice Sandstone, Evergreen Formation, Hutton Sandstone and Mulgildie Coal Measures were deposited. These units consist of freshwater fluvial quartzose sandstone, lacustrine siltstone/mudstone and local sequences. Middle Jurassic-Upper Tertiary movement along the Mulgildie and Anyarro faults produced a downthrown block between the faults preserving the Mulgildie Coal Measures and warping the Triassic-Jurassic sediments of the Mulgildie Basin in a gentle asymmetrical syncline. The Anyarro Fault is a north-south trending fault which runs between Monto and Anyarro and is probably the main structural control for Three Moon Creek (Jensen Gary, *pers. comm.).*

Tertiary basalt cappings occur throughout the region with some extensive areas occurring in the Rawbelle-Mount Hindmarsh areas in the north west of the area as well as in the Kalpowar area. Cainozoic deep weathering producing a lateritic profile over a large proportion of the study area. Much of this profile and modifications of it have since been removed by erosion. Relicts of the deep weathering profile are best preserved in the Yarrol and Mulgildie plateaus and the Coominglah Range.

Associated with this deep weathering profile are duricrusted sandstone, siltstone and claystone often exposed as mesas and cuestas but appears as a peneplain on the Auburn Plateau in the south west of the study area.

Quaternary alluvial gravels, sands and muds are deposited along the present day drainage systems.

Land systems

Geological formations were used as the basis for defining the land systems of the area. Further refinement was made using differences in landform, vegetation and soils. One hundred and four land

systems were identified in this manner. Five hundred and thirty six mapping units were defined for the area.

For ease of interpretation the land systems have been divided into eight groups based on broad, geological or geomorphological groups. These broad groups are:

Group 1. Alluvial systems;
Group 2. Deeply weathered sediments and basic volcanic rocks;
Group 3. Deeply weathered duricrusted sediments and acid intrusive rocks;
Group 4. Basic and intermediate intrusive and extrusive igneous rocks;
Group 5. Acid volcanic rocks;
Group 6. Acid intrusive rocks;
Group 7. Sedimentary rocks; and
Group 8. Metamorphic rocks.

Group 1. Alluvial systems

The alluvial land systems occupy 33 007 ha. Plains, levees, fans and backplains are common elements associated with these level to gently undulating alluvial plains. Two land systems, *Three Moon* and *Ceratodus,* are formed on more recent alluvia associated with the major creeks namely, Three Moon and Splinter Creeks and the Burnett River. Other rivers and major creeks of the area have narrower alluvial deposits, too small to map at the 250 000 scale. These small areas have been included in the description of the major land system through which these streams flow.

Cracking and non cracking clays are the major soils of the floodplains and drainage depressions of these land systems while on the levees, fans and backplains, gradational soils and non cracking clays, uniform coarse and medium textured soils, and sodic duplex soils are more common. The original eucalypt woodland of these land systems has largely been cleared. Some areas are not utilised to their full agricultural potential and improved or native pastures are grown under dryland conditions.

Dairying on irrigated pastures is a major enterprise carried out on these land systems. Lucerne hay production is also important. Beef cattle grazing and grain cropping with supplementary irrigation is also undertaken.

The other two land systems of this alluvial group are derived from older alluvial deposition. These systems usually are located on a higher level adjacent to the recent alluvium. The vegetation of the *Hollywell* land system was predominantly brigalow forest or shrubby eucalypt woodland while *Grosvenor* was predominantly eucalypt woodland. Cracking clays and sodic duplex soils are the major soils of these land systems. Grazing of beef cattle on native and improved pastures is the dominant enterprise associated with these land systems. Horticultural crops, mainly tree crops, as well as grain crops occupy small areas.

Group 2. Deeply weathered sediments and basic volcanic rocks

Five of the six land systems in this subdivision which occupy 31 572 ha are plateaus with associated bounding slopes. *Mulgildie* and *Yarrol* land systems are named after well known plateaus in the district. *Coominglah* land system includes the Coominglah Range north west of Monto. *Hungry Hills* is located in the south eastern part of the study area. *Hurdle* is located on footslopes and includes the cliffs of the sedimentary rocks of the Evergreen Formation. Land system *Glenleigh* is formed on deeply weathered basalt while the other land systems are derived from deeply weathered sediments.

The landform on the plateau surfaces of these land systems ranges from plains to rolling low hills. The bounding slopes of these plateaus are usually moderately inclined (15 to 30%).

The major soils of these land systems are deep, red, gradational soils and non cracking clays. Associated soils include massive earths and non sodic and sodic duplex soils.

Eucalypt woodland to forest is the major vegetation formation with "softwood scrub" species prominent in land systems *Hurdle, Yarrol* and *Mulgildie.*

Mulgildie and *Yarrol* land systems and the freehold areas of *Coominglah* are extensively cropped or grazed on the gentler slopes. The vegetation on *Coominglah* and *Hungry Hills* is only slightly disturbed as these areas are under the control of the Queensland Department of Primary Industries' Forestry Division. Most of *Hurdle* is also under the control of Department of Primary Industries or the Department of Environment and is largely undisturbed. Some areas of *Glenleigh* have been cleared and cultivated but now eucalypt regrowth is common and the major enterprise is grazing of beef cattle.

Group 3. Deeply weathered, duricrusted sediments and acid intrusive rocks

The five land systems in this subgroup are on deeply weathered parent materials associated with duricrusted mesas, cuestas and peneplains and occupy 200 849 ha.

Three land systems are derived from granitic parent material. *Lonepine 1* is located on gently undulating rises while *Lonepine 2* consists of rolling hills to steep hills. These land systems are confined to the south western portion of the study area. *Wingfield 2* adjoining the deeply weathered land system *Coominglah* is located on deeply weathered Wingfield Adamellite.

The two *Clonclose* land systems on duricrusted sediments have been divided on landform. *Clonclose 1* is on gently undulating rises to undulating rises and is located in the south-west of the study area. The larger mapping units of *Clonclose 2* consists of undulating low hills to rolling low hills. Thirty small mapping units of *Clonclose 2* have been identified and these consist of relict mesas and cuestas scattered throughout the study area.

The most common soils of these land systems are brown, yellow and grey sodic duplex soils, red and brown non sodic duplex soils, and red and brown structural gradational soils.

The land systems support a spotted gum, narrow-leaved ironbark open forest to woodland with an understory of "scrub" species.The degree of clearing has largely been influenced by landform and soils. Although of similar landform, *Lonepine 1* has been cleared more extensively than *Clonclose 1* due to the more suitable soils. Generally, limited clearing has been undertaken on the other land systems due to landform constraints. Most of the area covered by these land systems is used for beef cattle grazing with some areas within forestry reserves.

Group 4. Basic and intermediate, intrusive and extrusive igneous rocks

Twenty-one land systems occupying 147 951 ha have been identified in this group based on eleven different geological formations. Where appropriate further subdivision of these geological units was based on vegetation and landform.

The dominant vegetation on six of the land systems is brigalow and associated species and "softwood scrub" species usually on undulating rises. The other land systems support a eucalypt forest to woodland with landform varying from undulating rises to rolling hills and steep hills.

The *Hindmarsh* land systems are formed from Tertiary basalt either fresh or deeply weathered. *Hindmarsh 1* and *Hindmarsh 2* are located in the central west section of the study area, *Hindmarsh 3* near Kalpowar in the north east while *Hindmarsh 4* consists of a number of remnant plateaus usually in the north. These land systems except *Hindmarsh 1* are dominated by silver-leaved ironbark and narrow-leaved ironbark communities. The vegetation of *Hindmarsh 1* is dominated by belah-"softwood scrub" species.

The major soils of the above land systems are cracking clays and non cracking clays with red structured gradational soils and non cracking clays on the deeply weathered material. The major enterprise on these basaltic land systems are beef cattle grazing, usually of native pastures, with minor grain cropping.

Gabbro is the major rock type of the land systems *Goondicum, Delubra 1* and *2* and *Wateranga 1* and *2.* The distinct circular rimmed basin of the *Goondicum* land system is located in the north east. *Delubra* land systems are in the south western section while *Wateranga* land systems lie in the south eastern corner.

The landform of *Delubra 1* and *2* and *Wateranga 1* varies from undulating rises to undulating low hills. Rolling hills to steep hills are more frequent on land systems *Goondicum* and *Wateranga 2*.

Ironbark forest to woodland are common communities on the land systems except for *Delubra 1* which is dominated by brigalow, belah and "softwood scrub" forest.

Cracking clays and non cracking clays are the major soils of the land systems formed on gabbro.

Some grain cropping is undertaken on the lower sloping areas of these land systems but usually these slopes are extensively cleared and used for beef cattle grazing of native or improved pastures. The steeper sloping areas usually have little disturbance with beef cattle grazing the main enterprise.

The other land systems of this subdivision have mixed geologies with basic and intermediate lava and tuff the most common. *Greenbank* land system is formed on quartz diorite.

Nogo 1, 2 and *3* and *Narayen* land systems are located in the central to south western parts of the study area. *Brumby, Kariboe, Owlgully* and *Muncon 3* land systems are located in the north west and northern parts. *Greenbank* lies in the north-west while *Muncon 1* and *2* are more common in the central section north and north east of Monto.

Landform of these land systems varies from undulating rises and undulating low hills to rolling low hills and hills to steep hills. Brigalow and "softwood scrub" species are the dominant vegetation of *Muncon 1, Nogo 1, Narayen* and *Brumby* land systems. Ironbark forest to woodland are the major communities of the other land systems.

Cracking clays, gradational soils and non cracking clays, and non sodic and sodic duplex soils are the major soils of these land systems. Shallow, stony medium textured soils over rock are often found on the higher crests and ridges of the steeper land systems such as *Owlgully 2* and *Muncon 3.*

Generally, limited clearing has been undertaken on the steeper land systems although some extensive clearing has been undertaken in the *Greenbank* and *Kariboe* land systems. Some grain cropping is undertaken on the lower sloping lands but grazing of native and improved pastures is a more

common enterprise. Beef cattle grazing is the major enterprise associated with the steeper land systems. Much of the *Muncon 3* land system is under State Forest and is logged for native timber.

Group 5. Acid volcanic rocks

Three different geological formations are associated with this broad geological grouping which comprises seven land systems and occupies 53 243 ha. One of these formations, the Aranbanga Volcanic Group, has been divided into five land systems based on differences in landform, vegetation and soils. Land system *Torsdale* is located in the south-western portion of the study area while *Eagle* is closer to the central western area. The *Aranbanga* land systems are confined more to the south east.

The landform of the *Torsdale* land system formed mainly from acidic tuff varies from undulating low hills to rolling low hills. Spotted gum open forest to woodland, often with a shrubby understory, is the major vegetation formation associated with this land system.

The rolling hills of the *Eagle* land system are on rhyolitic and dactitic flows and pyroclastics. The dominant species of the eucalypt woodland to open woodland are narrow-leaved ironbark, spotted gum and bloodwoods, often with a shrubby understory.

The rolling hills and steep mountains of *Aranbanga 1* support a "softwood scrub" forest. The landforms of land systems *Aranbanga 2* to *5* range from undulating to rolling low hills to rolling hills and steep hills. The vegetation formation usually consists of narrow-leaved ironbark woodland to open forest.

Non sodic and sodic duplex soils, gradational soils and non cracking clays are common soils of these land systems. Shallow, fine to coarse textured soils over rock are often associated on the steeper land systems such as *Eagle* and *Aranbanga 5.*

Although limited clearing has been undertaken on the steeper land systems *Aranbanga 1, 4* and *5*, *Torsdale* and *Eagle,* some small areas have been extensively cleared. The other land systems have been extensively cleared. Beef cattle grazing is the major enterprise of these land systems. Some areas are under State Forest and an area of *Aranbanga 1* a Natural Park.

Group 6. Acid intrusive rocks

Twenty four land systems which occupy 270 149 ha have been identified on acid intrusive rocks, namely granite, granodiorite and adamellite.

Four of the geological units were further subdivided into eight land systems based on differences in landform. These land systems are scattered throughout the study area with a greater concentration in the north east and central western parts.

Landform varies from undulating rises to undulating low hills through to rolling hills and steep hills.

The land system *Moocoo* is dominated by brigalow while *Glandore* has areas of "softwood scrub" forest. The other land systems have eucalypt open forest to woodland, some with a shrubby understory. The major eucalypt species of most of these land systems is narrow-leaved ironbark.

The major soils of these land systems are sodic and non sodic duplex soils with coarse textured surface horizons as well as some uniform coarse textured soils.

The undulating rises to undulating low hills have been extensively cleared for grazing. Although the steeper landforms such as the rolling hills to steep hills have had limited clearing, some of the rolling low hills, especially those of *Perry 1, Nour, Wingfield 1* and *Briggs 1,* have also been extensively cleared. The major enterprise carried out on these land systems is the grazing of beef cattle on native pastures. Minor forestry reserves are associated with this grouping.

Group 7. Sedimentary rocks

Thirty-one land systems have been identified on the wide range of sedimentary rocks of the area. These land systems occupy 389 509 ha.
Different landforms, vegetation and soil sequences were used to subdivide the twelve different geological formations recognised.

These land systems are distributed throughout the central part of the study area with minor occurrences in the central north west, south west and eastern sections.

Eleven land systems support a brigalow or "softwood scrub" forest often with a eucalypt shrubby woodland associated.

An ironbark, spotted gum or poplar box woodland, sometimes with a shrubby understory is common on the other land systems.

Ten land systems have been identified on the Evergreen geological formation. Undulating low hills is the major landform of the *Evergreen* land systems although the undulating to rolling rises of *Evergreen 1* is on a plateau. The higher and steeper country of *Evergreen 5* and *10* ranges from rolling low hills and hills to steep hills.

Cracking clays are an important soil group in these land systems occurring as major or minor component in fifteen of the land systems. Cracking clays occur on the whole *Monto* land system on the Mulgildie Coal Measures. They make up a large proportion of *Evergreen 2, 3* and *5* as well as *Trapyard, Cynthia* and the land system *Cannindah* which is formed on limestone. Other important soils on these land systems include gradational soils and non cracking clays as well as sodic and non sodic duplex soils. Much of the steeper lands such as land systems *Youlambie, Caswell 3, Caswell 4* and *5, Evergreen 10, Bania 2* and *Precipice* have very shallow to shallow, stony, medium textured soils over rock. Shallow to deep, uniform, coarse textured soils are the only soils present on *Evergreen 1*.

A large proportion of the land systems supporting brigalow or "softwood scrub" species on undulating low hills are completely cleared and are under cultivation or improved pastures. These land systems include *Evergreen 2* and *3, Monto, Trapyard, Kapaldo, Evergreen 4* and the lower slopes of *Caswell 1* and *Evergreen 5.* Much of the lower sloping land systems on undulating rises supporting a eucalypt woodland, have been extensively or completely cleared especially where non cracking and cracking clays are prominent.

Those land systems with rolling low hills and steeper lands generally have had limited clearing with some extensive clearing on the lower slopes. Most are used for cattle grazing. A large proportion of *Bania 1* and *2* are within State Forest land. Some of the mapping units of the *Precipic*e land system are under the control of State Government Departments with the Cania Gorge and the Cania Dam popular tourist attractions. Cultivation for dryland cropping has largely been abandoned on the lower

slopes due to high soil erosion losses especially on the sodic duplex soils of *Hutton 1* and *2* and *Caswell 2.* Most of these lands are now under native or improved pastures and used for beef cattle grazing.

Group 8. Metamorphic rocks

Seven land systems have been identified on metamorphic rocks namely Goodnight Beds and an undivided Formation of the Curtis Island Group. These land systems are located on the eastern part of the survey area and occupy 18 729 ha. Five land systems were described on Goodnight Beds, the subdivisions being based on vegetation and landform. *Goodnight 1* supports a "softwood scrub" community while *Goodnight 2* to *5*, which support a eucalypt forest, are subdivided on landform ranging from undulating low hills to rolling low hills to steep hills.

Both *Curtis* land systems support a eucalypt woodland but *Curtis 1* is on lower relief of undulating low hills to rolling low hills while *Curtis 2* occurs on rolling low hills to steep hills.

Shallow, stony, medium textured soils over rock are common soils of the land systems except for *Goodnight 1* and *Goodnight 4*. Sodic duplex soils, gradational soils and non cracking clays are also present. Land systems *Goodnight 1* and *4* have a higher proportion of brown and red gradational soils and non cracking clays.

Limited clearing has occurred on land systems *Goodnight 1, Goodnight 4* and *5* and *Curtis 2.* Extensive clearing has been undertaken on the other land systems. Beef cattle grazing of native pastures is the major enterprise carried out on these land systems.

Vegetation

The vegetation of Mt Perry, Monto, Scoria, Biloela and Calliope 1:100 000 sheets have been mapped by the Department of Environment. The vegetation of the Narayen Research Station has been described by Coaldrake *et al.* (1972). Forest vegetation has been recorded at a range of intensities in the State Forest areas. The dominant vegetation formation and the major species have been described for each land system and are given in the map reference. The same information has been given for each land unit in the land system descriptions. The formation and up to four of the vegetation species have been recorded on the computer database for each land unit. The common names and the botanical names for the major species recorded in the area are listed in Appendix II. In areas which are completely or extensively cleared the descriptions are based on remnants of the original communities.

The range of disturbances of the natural vegetation throughout the area varies from limited clearing to complete clearing. An estimate of the disturbance, based mainly on field observations from 1992–94, using the ratings as described in McDonald *et al.* (1990) has been made for each mapping unit. This estimate has been recorded on the computer database.

About 540 000 ha or 47% of the area is estimated to have limited clearing. Extensive clearing has been undertaken over about 40% of the area. Complete clearing with native or improved pastures occurs over 4% of the area. An area of 35 000 ha is estimated to be used for cultivation under rainfed or irrigated conditions. State Forest Reserves occupy about 175 263 ha or about 16% of the area with grazing rights over much of this area. A Hoop pine plantation has been established near Kalpowar.

Where possible, land systems dominated by brigalow or "softwood scrub" species have been separated from land systems dominated by eucalypt species. The vegetation of some land systems is

dominated by eucalypt scrubby woodland that is a eucalypt woodland with a scrub understory of "softwood scrub" species. However, many of the land units within land systems dominated by eucalypt or scrub species have mixed communities.

Brigalow and "softwood scrub" communities

Brigalow forest or "softwood scrub" forest are the dominant vegetation community on twenty three land systems. Brigalow and associated species such as belah, wilga and bottle tree dominate the land systems of *Monto, Evergreen 2* and *3, Hollywell, Trapyard, Narayen, Moocoo, Delubra 1, Nogo 1, Kapaldo, Evergreen 4* and *Hutton 1*. "Softwood scrub" species occupy most of the land systems of *Hurdle, Goodnight 1, Aranbanga 1, Bania 1, Brumby, Muncon 1, Hindmarsh 1, Caswell 1, Evergreen 5, Mulgildie* and *Yarrol*.

Eucalypt communities

Eucalypt woodland is the most common eucalypt formation. Eucalypt open forest is less common while eucalypt open woodland is usually only present on the lower parts of the landscape.

Narrow-leaved ironbark open forest to woodland

This community occurs throughout the area and is usually associated with crests and upper and midslopes. Pure stands are not common and the most common species occurring with narrow-leaved ironbark are spotted gum, bloodwood species, silver-leaved ironbark and Moreton Bay ash.

Narrow-leaved ironbark is the dominant species in about 30% of the land units described. It occupies more than 40% of the vegetation of the land systems usually of higher relief such as *Aranbanga 5, Eagle, Hogback, Hungry Hills, Perry 2, Raspberry 2, Wolca 2, Goodnight 3, Goodnight 4, Muncon 3, Precipice, Curtis 2, Wingfield 2, Clonclose 2* and *Evergreen 10*. Many other land systems have significant areas of this community.

Spotted gum open forest to woodland

This community is usually associated with narrow-leaved ironbark and occurs on similar landscapes to those with narrow-leaved ironbark communities. Other species that may be associated include bloodwood species, Moreton Bay ash and gum topped box.

Bloodwood woodland

The more common bloodwood species occurring in the area include pink bloodwood, brown bloodwood, long-fruited bloodwood, and gum topped bloodwood. These species, usually occurring with narrow-leaved ironbark and silver-leaved ironbark, are found on many of the land systems developed on basic and intermediate intrusive and extrusive rocks.

Silver-leaved ironbark woodland

Pure stands of silver-leaved ironbark have been recorded in land units of land systems *Harrami, Hindmarsh 2, Owlgully 1* and *2, Wingfield 1, Delubra 2* and *Muncon 2*. However this species is more

commonly associated with bloodwood species, narrow-leaved ironbark, Moreton Bay ash and Queensland blue gum. Those land systems developed on basic and intermediate, intrusive and extrusive igneous rocks are more likely to have vegetation communities dominated by silver-leaved ironbark. However land systems on acid intrusive rocks such as *Glandore, Cheltenham, Mingo* and *Coonambula* have significant areas together with *Cannindah, Caswell 2* and *3, Harrami* and *Hutton* on the sedimentary rocks.

Gum topped box woodland

Gum topped box occurs on the lower slopes and valley flats of many of the land systems especially those developed on sedimentary rocks. Other species occurring in association include narrow-leaved ironbark, spotted gum, poplar box and Moreton Bay ash.

Poplar box woodland

Poplar box is common on the alluvial plains of the alluvial land systems such as *Grosvenor* and *Ceratodus* as well as the lower slopes and drainage lines of many of the other land systems. The more common species associated with this community include Moreton Bay ash, Queensland blue gum, silver-leaved ironbark and gum-topped box. Wilga and false sandalwood are common scrub species associated with it.

Queensland blue gum open woodland

Queensland blue gum is the dominant species on about 10% of the land units especially on the lower slopes and valley flats.

This species occurs over a whole range of land systems. Rough bark apple and Moreton Bay ash are the most commonly associated species.

Landform and Drainage

Landform

Generally the landform of the area is controlled by the nature of the underlying rock units, intensity of weathering and their varying resistance to erosion. The area may be divided into two sections by a line running north–north west from east of Eidsvold through the Wuruma Dam exiting from the study area about 5 km east of the Burnett highway. To the east of this line the topography is hilly with areas of lower relief along and adjacent to the major streams. West of this line the topography is much gentler.

Landform for the area is described in the terms used by McDonald *et al.* (1990). The relief of the area ranges from extremely low to high or from plains to hills and mountains in terms of erosional landform pattern. Model slope class varies from level (<1%) on the alluvial plains to steep slopes (32–56%) on the hills and mountains. Many plateaus with a range of sizes exist throughout the area.

The five landform patterns of the area namely plains, rises, low hills, hills and mountains and plateaus are discussed below.

(a) Plains

Level to gently undulating plains on the four alluvial land systems occupy about 33 000 ha or 3% of the area. The main landform elements within these alluvial plains are levees, plains, backplains, drainage depressions and fans.

(b) Rises

Rises which have relative relief varying from 9–30 m include gently undulating rises (slopes from 1–3%), undulating rises (3–10%) and rolling rises (10–32%).

Gently undulating rises of mapping units *Lonepine 1* and *Clonclose 1* occupy about 80 000 ha. The undulating rises of mapping units *Brumby, Clonclose 1, Cynthia, Hindmarsh 1, Hindmarsh 2, Lochabar, Mingo, Muncon 1,* complexes of *Muncon 1* and *Muncon 2, Narayen, Nogo 1, Nogo 2* and *Wateranga 1* occur on about 72 000 ha. Rolling rises occur on only two mapping units in the area. Mapping unit 478 *(Hindmarsh 1)* occupies 2327 ha while mapping unit 58 *(Lochabar)* occupies 615 ha.

(c) Low hills

Low hills which have relief varying from 30–90 m include undulating low hills which are gently inclined (3–10%) and rolling low hills which range in slope from 10–32%.

About 43 387 ha of the area is occupied by undulating low hills with a further 233 780 ha occupied by rolling low hills.

(d) Hills and mountains

Undulating hills (3–10% slope) rolling hills (10–32%) and steep hills (32–56%) describe areas with relative relief between 90 and 300 m. Small areas with greater than 300 m relative relief (mountains) also occur.

Only seven mapping units including those of *Boolgal* and *Caswell 1* occur as undulating hills and occupy 9700 ha. Rolling hills are much more prominent and occupy 253 276 ha. Steep hills with slopes between 32–56% only occupy 19 500 ha over seven mapping units and include the land systems of *Hindmarsh 4, Monal 2, Precipice* and *Perry 2*.

(e) Plateaus

A plateau is a level to rolling landform pattern of plains, rises or low hills standing above a cliff, scarp or escarpment that extends around a large part of its perimeter (McDonald *et al.* 1990). Gently undulating, undulating and rolling modal slope classes occur within the plateaus.

About 50 000 ha occur as plateaus within the study area. The many mapping units of *Clonclose 2* occur on small plateaus or mesas throughout the area. Other land systems with mapping units occurring as plateaus include *Coominglah, Glenleigh, Hungry Hills, Mulgildie, Yarrol* and *Hindmarsh* land systems.

Drainage

The Burnett River is the major river in the area into which all streams flow. The Auburn, Nogo and Perry Rivers are minor rivers of the area.

The major rivers and creeks of the North Burnett area are shown in Figure 4.

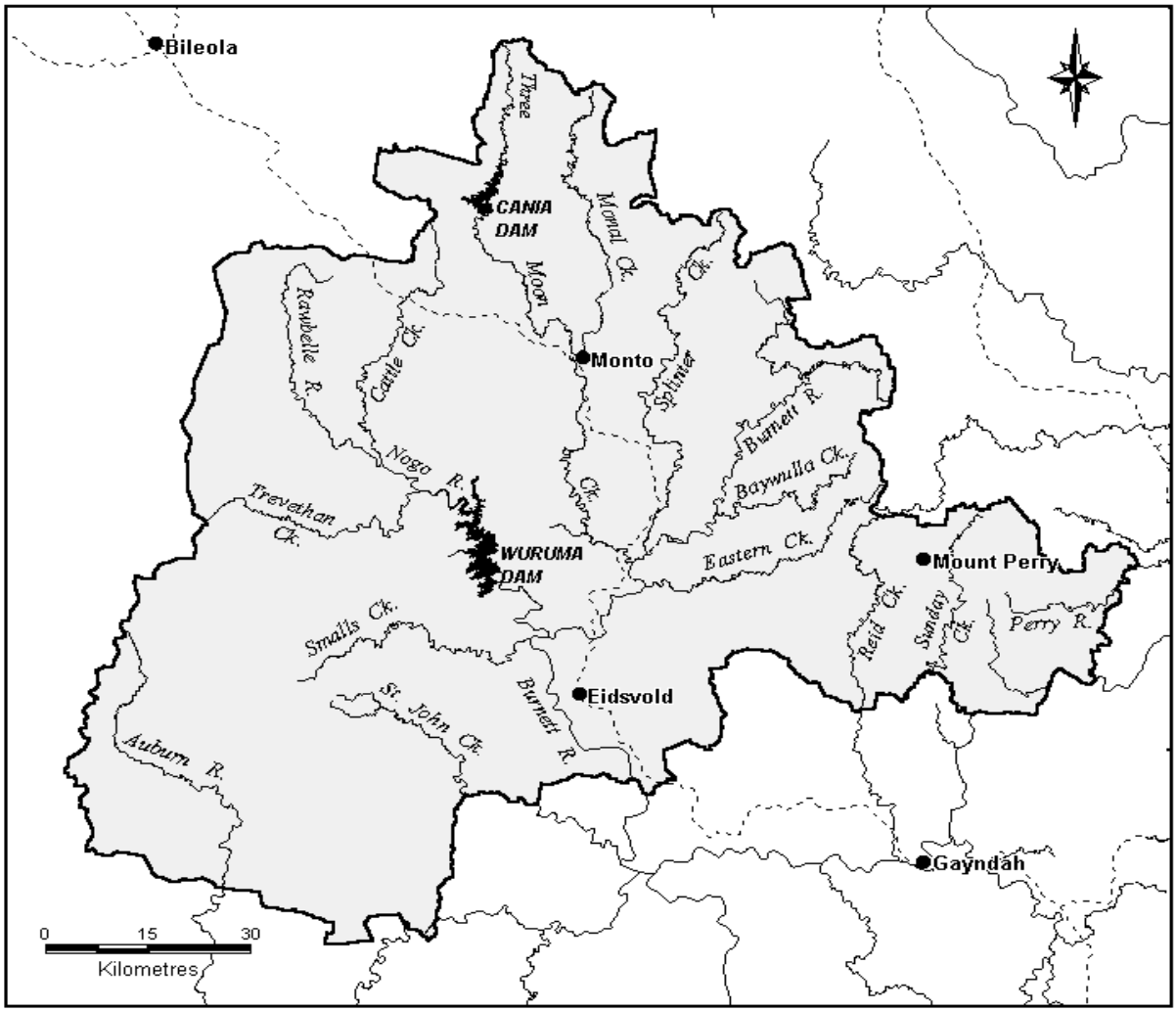

Figure 4. Major rivers and creeks of the North Burnett area.

The Burnett River commences in the north part of the survey area, south west of Kalpowar and drains in a southerly direction towards Mundubbera in the Central Burnett area. The Boyne River which drains the South Burnett area and the Auburn River flow into the Burnett River just west of Mundubbera which then flows in an easterly direction towards the coast.

The Auburn River drains the south western corner of the study area. St John Creek which commences near the Eidsvold–Theodore road east of Clonclose Homestead flows eastwards directly into the Burnett River. The Nogo River with its headwaters in the north west near Harrami drains into Wuruma Dam and then flows in a southerly direction to join the Burnett River north of Eidsvold. Trevethan, Smalls and Cattle Creek are the major tributaries of the Nogo River.

In the north, Three Moon Creek feeds into Cania Dam, and flows southwards into the Burnett River below Abercorn. Monal Creek flows into Three Moon Creek north of Monto while Splinter Creek which commences south of Kalpowar drains southwards directly into the Burnett River.

Baywulla and Eastern Creeks flow in a westerly direction into the Burnett River and drain part of the north eastern area. Reid Creek, Sunday Creek with its headwaters near Mt Perry and Outside Creek flow southwards into the Burnett River.Perry River with its headwaters east of Mt Perry drains eastwards into the Burnett River.

The major dams of the area are the Cania dam in the north and the Wuruma dam in the central portion of the area. Cania dam on Three Moon Creek has a capacity of 89 000 Ml and is used mainly to recharge the aquifer along Three Moon Creek for irrigation uses. Wuruma dam situated on the Nogo River has a capacity of 165 400 Ml and supplies water for irrigation as well as for town water supplies along the Burnett River below the Nogo River junction.

Soils

Morphology

Introduction

Broad scale mapping of this area was undertaken by Isbell *et al.* (1967) for the Atlas of Australian Soils at a scale of 1:2 000 000. Maher (1993) and Smith and Kent (1993) described the land resources of the region at 1:500 000. About 4260 ha at the junction of the Burnett River and Three Moon Creek, near the railway siding of Ceratodus has been mapped at 1:50 000 scale by Kent *et al.* (1989), Donnollan and Searle (1998) mapped the soils in the Three Moon Creek Catchment at a range of scales. Thompson (1998) described the soils, of the Narayen Research Station especially those supporting brigalow and "softwood scrub" species.

Soil classification

The Australian Soil Classification System (Isbell, 1996) was used to classify the soils of the area. Other terms using more common soil terminology are included for ease of interpretation. A brief description of the Soil Orders of the Australian Soil Classification is given in Table 2.

Table 2. A brief description of the soil orders of the Australian Soil Classification

Soil Order	Common names	Brief description
Chromosols	Non sodic duplex soils and sodic duplex soils (sodic at depth).	Soils with strong texture contrast between A and B horizons. The latter are not strongly acid and are not sodic in the upper B horizon but may be sodic at depth.
Dermosols	Non cracking clays and structured gradational soils.	Soils with structured B horizons and lacking strong texture contrast between A and B horizons soils with negligible pedologic organisation.
Ferrosols	Structured gradational soils and non cracking clays with high free Fe content.	Soils with B2 horizons which are high in free iron oxide and which lack strong texture contrast between the A and B horizons.
Kandosols	Massive gradational soils.	Soils which lack strong texture contrast, have massive or only weakly structured B horizons, and are not calcareous throughout.
Rudosols	Shallow medium and coarse textured soils over rock.	Soils with negligible pedologic organisation.
Sodosols	Sodic duplex soils.	Soils with strong texture contrast between the A horizons and B horizons which are not strongly acid but are sodic in the upper 0.2 m.
Tenosols	Shallow medium and coarse textured soils over rock.	Soils with weak pedologic organisation apart from the A horizons.
Vertosols	Cracking clays	Soils with clay content >35% with shrink-swell properties that exhibit strong cracking when dry and at depth have slickensides and/or lenticular structure.

In the description of the land systems, the soils have been described in terms of depth to parent material and type of profile. A more detailed description of the soils is given in the land unit descriptions, including the depth of soil, the condition of the surface, thickness and texture of the A horizons, texture of the B horizons and soil reaction trend. Classification to the suborder level of Isbell (1996) is also given. These detailed soils descriptions are given in Appendix I.

Land system subdivisions

The broad geological group into which the land systems were subdivided contain a wide range of soils. However, dominant soils groups occur in most subdivisions. The most diverse soil groups occur in the large sedimentary rock diversion of group 7. The major and minor soils of the land system subdivisions as well as some comments on their distribution are shown in Table 3.

Soil orders

Vertosols

The order Vertosols in the Australian Soil Classification (Isbell, 1994) is subdivided into suborders by colour, namely red, brown, yellow, grey and black. The symbol Ug identifies Vertosols in the Factual key of Northcote (1979). In the great soil group classification system, (Stace *et al.,* 1968) they are termed grey, brown and red clays and black earths.

Due to their high clay content (>35%) and shrink swell properties Vertosols have a number of unique properties. Vertosols usually have high plant available water capacity (PAWC) so are important soils for storing water for subsequent crop growth. Vertosols are usually imperfectly drained with the Red Vertosols the better drained and the grey Vertosols the poorer drained. Vertosols have a specific moisture content range during which tillage can successfully be carried out as they smear when too wet and shatter when too dry. Strong self mulching surfaces usually found on the Vertosols of *Three Moon, Hindmarsh, Narayen, Nogo, Delubra, Monto* and *Muncon* land systems offer fewer problems with germination and emergence than the weak self mulching to hardsetting surfaces associated with cracking clays of other land systems. Most of the Vertosols of the study area have an alkaline soil reaction trend although some soils in *Monto, Hindmarsh 1* and *Trapyard* land systems have acid subsoils.

Black Vertosols are important soils of the alluvial land systems (group 1), especially of *Three Moon*, *Hollywell* and *Grosvenor*. Black Vertosols are also an important group of soils in many of the land systems of geological group 4 including *Hindmarsh 2*, *Nogo 2, Delubra 2, Hindmarsh 1* and *3, Nogo 1* and *Wateranga 1*. Nine land systems including *Monto, Evergreen 3, Cynthia, Cannindah* and *Trapyard* within the sedimentary rock geological subdivision (group 7) also have significant areas of Black Vertosols.

Grey Vertosols are the dominant soils in some of the land units of nine land systems. Most of these land systems are within group 7 although *Muncon 1* (group 4) and *Hollywell* (group 1) have 35% and 25% of their area occupied by Grey Vertosol.

Brown Vertosols are important soils of some of the land systems of geological group 7 and group 4 with over 50% of *Monto, Trapyard, Evergreen 4, Kapaldo* and *Muncon 1* occupied by Brown Vertosols. They occupy minor areas of the *Grosvenor and Hollywell* land systems in group 1.

Table 3. Major and minor soils of the eight subdivisions of the land systems

Land system subdivision	Major soils	Minor soils	Comments
Alluvial systems (group 1)	Cracking clays (Vertosols) Sodic duplex soils (Sodosols) Non cracking clays and gradational soils (Dermosols)		Vertosols and Dermosols are more common on the younger alluvium systems (Three Moon and Ceratodus) while Sodosols and Vertosols are the major soils of the older alluvia (Grosvenor and Hollywell)
Deeply weathered sediments and basic volcanic rocks (group 2).	Red gradational soils and non cracking clays with high free iron content(Ferrosols).	Duplex soils (Sodosols and Chromosols). Massive gradational soils (Kandosols). Structured gradational soils and non cracking clays (Dermosols).	
Deeply weathered, duricrusted sediments and acid intrusive rocks (group 3).	Sodic duplex soils (Sodosols and Chromosols). Non sodic duplex soils (Chromosols). Massive gradational soils (Kandosols.) Structured gradational soils (Dermosols).		
Basic and intermediate, intrusive and extrusive igneous rocks (group 4).	Cracking clays (Vertosols). Non cracking clays (Dermosols). Non sodic duplex soils (Chromosols). Sodic duplex soils (Sodosols and Chromosols).	Shallow medium and coarse textured soils over rock (Tenosols and Rudosols). Gradational soils and non cracking clays with high free iron content (Ferrosols).	The Tenosols and Rudosols are usually present on some of the steeper and higher land systems. Ferrosols present on deeply weathered parent materials. Vertosols are more common on land systems with lower relief.
Acid volcanic rocks (group 5).	Non cracking clays and gradational soils (Dermosols). Non sodic duplex soils (Chromosols). Sodic duplex soils (Sodosols and Chromosols). Shallow, medium and coarse textured soils over rock (Tenosols and Rudosols).		Tenosols and Rudosols are prominent soils on the crests and upper slopes of land systems with higher relief.
Acid intrusive rocks (group 6).	Sodic duplex soils (Sodosols and Chromosols). Non sodic duplex soils (Chromosols).	Uniform coarse textured soils (Tenosols and Rudosols). Structured gradational soils (Dermosols).	The Sodosols and Chromosols usually have sandy textured A horizons.
Sedimentary rocks (group 7).	Cracking clays (Vertosols). Gradational soils and non cracking clays (Dermosols). Sodic and non sodic duplex soils (Sodosols and Chromosols).	Shallow medium and coarse textured soils over rock (Tenosols and Rudosols).	Surface textures of the duplex soils are usually loamy to clay loamy. Some land units with the land systems *Evergreen 1, Hutton 3* and *Precipice* have sandy textures. Tenosols and Rudosols are often found on the crests and upper slopes of the land systems with higher relief.
Metamorphic rocks (group 8).	Medium textured soils over rock (Tenosols and Rudosols). Sodic duplex soils (Sodosols and Chromosols).	Gradational soils and non cracking clays (Dermosols). Cracking clays (Vertosols). Massive gradational soils (Kandosols).	The Tenosols and Rudosols are common soils on the higher crests and slopes. Sodosols and Chromosols usually occur on mid and lower slopes. Dermosols are common soils of *Goodnight 1* but are rare in other land systems.

Red Vertosols, although not common throughout the area, are important soils on *Muncon 2* (45%), *Harrami* (30%), and *Evergreen 7* (20%).

Land systems shown in Table 4 have greater than 25% of their estimated area occupied by Vertosols.

Table 4. Estimated areas of land systems with greater than 25% occupied by Vertosols in the North Burnett area

Soils	Land System	Percentage of land system	Area (ha)
Black Vertosols	Hindmarsh 2	85	13563
	Nogo 2	60	7068
	Narayen	50	6886
	Three Moon	50	7238
	Evergreen 3	40	584
	Grosvenor	40	2117
	Hollywell	40	568
	Delubra 2	35	3249
	Monto	35	3578
	Wateranga 1	35	615
	Hindmarsh 1	32	4256
	Cannindah	30	273
	Cynthia	30	679
	Evergreen 2	30	1270
	Hindmarsh 3	30	464
	Nogo 1	30	635
Brown Vertosols	Trapyard	65	1197
	Monto	60	6134
	Evergreen 4	55	2272
	Kapaldo	50	2481
	Muncon 1	50	1159
	Nogo 1	40	847
	Cannindah	30	273
	Delubra 1	30	3190
Grey Vertosols	Evergreen 5	69	2007
	Muncon 1	35	811
Red Vertosols	Muncon 2	45	3359
	Harrami	30	6753

Dermosols

Dermosols lack a clear or abrupt textural B horizon, do not have free iron oxide content greater than 5% Fe, are not calcareous throughout and have moderate to strongly structured B2 horizons. The suborders are differentiated by colour, namely red, brown, yellow, grey and black. In terms of Stace *et al.* (1968), prairie soils and some red and yellow podzolic soils qualify as Dermosols. In the Factual key (Northcote, 1979), a wide range of Gn3 and Gn4 soils together with Um4.4, Um6.3 and Uf6.3 soils are Dermosols. Chromosols, Vertosols and Sodosols are often found associated with Dermosols. Rudosols and Tenosols are also associated with the shallower Dermosols when B horizons have not developed.

Most Dermosols of the study area have clay loam to light clay surface horizons, 0.2 to 0.4 m thick and the surfaces set hard which may present some problems with germination and emergence. Most soils are moderately deep to deep but some shallow soils may be found on the crests, upper and midslopes of many of the land systems. These soils are usually imperfectly drained to moderately

well drained with the Red Dermosols the better drained of the group. Most have a neutral to alkaline soil reaction trend.

Red Dermosols are common in land systems within geological group 7 and some of the land systems of group 4, 5 and 8, with minor occurrences in the other geological group. Red Dermosols occupy all of *Brumby* land system and are also important in land systems *Aranbanga 1, Wateranga 2* and *Goodnight 4* with 90%, 70% and 70% respectively.

Brown Dermosols are the dominant soils over 80% of *Caswell 1* land system and are common (>25%) in land systems *Cannindah, Caswell 2, Evergreen 6* and *7* of geological group 7. *Wateranga 2* (group 4) and *Goodnight 1* (group 8) also have large areas of Brown Dermosols.

Black Dermosols occupy about 50% of the area of land systems of *Aranbanga 2* and *3* of group 5. They are also common in land systems *Wateranga 1* and *Hindmarsh 4.* The alluvial land systems *Ceratodus* and *Three Moon* also have significant areas of Black Dermosols.

Yellow and Grey Dermosols are not common in the area although about 20% of *Bania 2*, 40% of *Kapaldo* and 20% of *Scalper* land systems are occupied by these soils.

Land systems shown in Table 5 have greater than 25% of their estimated area occupied by Dermosols.

Table 5. Estimated areas of land systems with greater than 25% occupied by Dermosols in the North Burnett area

Soils	Land System	Percentage of land system	Area (ha)
Red Dermosols	Brumby	100	660
	Aranbanga 1	90	1029
	Goodnight 4	70	1291
	Wateranga 2	70	211
	Evergreen 6	40	2245
	Monal 2	40	1706
	Scalper	40	835
	Bania 1	30	2039
	Delubra 1	30	3190
	Goodnight 1	30	155
	Precipice	30	6738
Brown Dermosols	Caswell 1	80	9666
	Goodnight 1	65	335
	Cannindah	40	364
	Evergreen 7	40	580
	Caswell 2	30	10547
	Evergreen 6	30	1347
	Wateranga 2	30	90
Black Dermosols	Wateranga 1	50	878
	Aranbanga 2	48	1807
	Aranbanga 3	46	3451
	Hindmarsh 4	30	1388
	Three Moon	30	4343
Grey Dermosols	Kapaldo	40	1488

Chromosols

Chromosols are soils with strong texture contrast between A and B horizons and the major part of the upper 0.2 m of the B horizons is not sodic and not strongly acid. However, the lower B horizons may be sodic but this property is not distinguished until the subgroup level of the Australian Soil Classification. Many non calcic brown soils, some red brown earths and range of podzolic soils of Stace *et al.* (1968) may be called Chromosols. Chromosols are represented by D in the Factual key of Northcote (1979) and are further subdivided by the colour of the B horizons.

In this report, the soil terms non sodic duplex soils and sodic duplex soils (soils are sodic at depth) have been used to describe Chromosols. The suborders of the Chromosols are separated on colour.

Many Chromosols in this area especially in land systems from group 6 have sandy loam to sandy clay loam horizons 0.3 to 0.6 m thick. Soils with loamy A horizon textures (loam to clay loam) are usually thinner. Bleached A2 horizons are common in these soils but are not always present. The B horizons of those soils with bleached A2 horizons are less permeable than those without. The moderately to well drained Red Chromosols were often found on the crests and upper slopes. Most Chromosols in this area have acid to neutral soil reaction trends. Those soils alkaline at depth are sodic at depth and in this report are called sodic duplex soils.

In this area, Chromosols are often associated with Sodosols and Dermosols. Tenosols and Rudosols are associated with the shallower Chromosols. Kandosols and Ferrosols are minor soils associated with the Chromosols.

Red Chromosols are common soils in all geological groups except groups 1, 2 and 8.

Of group 6, Red Chromosols are common in *Glandore*, *Eidsvold*, *Lochabar*, *Cheltenham*, *Rawbelle*, *Wolca 1* and *Wolca 2*. For group 4, *Kariboe*, *Delubra 2*, *Greenbank*, *Nogo 3* and *Delubra 1* have large proportions of their areas occupied by Red Chromosols.

Caswell 4, *Evergreen 9*, *Monal 1* and *Monal 2* of group 7 also have Red Chromosols as a dominant soil group.

Red Chromosols are also common in land systems *Aranbanga 3*, *Lonepine 2* and *Wingfield 2*.

Brown Chromosols are important soils of land systems in groups 6, 7, 5 and 4. Land systems with a high proportion of Brown Chromosols include *Aranbanga 2* and *4*, *Briggs 1* and *2*, *Cheltenham*, *Coonambula*, *Gaeta*, *Glandore, Goodnight 4*, *Hutton 1*, *Lochabar*, *Muncon 2*, *Nour*, *Raspberry 1* and *2*, *Torsdale* and *Wingfield 1*.Many of these Brown Chromosols become sodic at depth.

Yellow, Grey and Black Chromosols are less common throughout the area than that of the other Chromosols. Black Chromosols are dominant in only one land unit, namely land unit 7 of *Narayen.* Yellow and Grey Chromosols occupy 20% of *Briggs 1,* 15% of *Coominglah,* and 25% of *Hutton 3*. Smaller proportions of these Chromosols occur in other land systems.

Land systems shown in Table 6 have greater than 25% of their area occupied by Chromosols.

Ferrosols

Ferrosols are deep, well drained, usually strongly structured soils. However in this area, especially in the deeply weathered sediments, Ferrosols have massive to weakly structured, thick to very thick A and B1 horizons, overlying a well structured B2 horizon.

Table 6. Estimated areas of land systems with greater than 25% occupied by Chromosols in the North Burnett area

Soils	Land System	Percentage of land system	Area (ha)
Red Chromosols	Glandore	75	6577
	Wolca	65	7209
	Kariboe	60	2073
	Delubra 2	55	5106
	Eidsvold	55	2208
	Greenbank	55	675
	Lonepine 2	55	16569
	Evergreen 9	50	1325
	Monal 2	50	2133
	Monal 1	45	670
	Rawbelle	40	15389
	Wingfield 2	40	1008
	Cheltenham	35	2105
	Owlgully 1	35	2025
	Aranbanga 3	30	2251
	Mingo	30	1049
	Nogo 3	30	2513
Brown Chromosols	Raspberry 2	85	1215
	Briggs 2	75	1845
	Raspberry 1	70	1235
	Torsdale	70	5137
	Wingfield 1	68	7341
	Nour	65	616
	Briggs 1	60	1657
	Coonambula	60	9641
	Wonbah	60	1559
	Aranbanga 4	50	4939
	Gaeta	45	590
	Aranbanga 2	40	1506
	Cheltenham	40	2405
	Hutton 1	40	1268
	Goodnight 5	35	1421
	Lochabar	35	259
	Muncon 2	35	2612
	Evergreen 9	30	795
	Greenbank	30	368
	Wolca	30	3327

Red Ferrosols are the major soils of the deeply weathered land systems of group 2. These land systems include *Mulgildie, Yarrol, Glenleigh, Coominglah, Hungry Hills* and *Hurdle*. These soils are also important components of some land systems in geological group 4 including *Hindmarsh 1, 3* and *4* and *Goondicum.*

Brown Ferrosols occupy about 30% of the *Goondicum* land system.

Land systems shown in Table 7 have greater than 25% of their area occupied by Ferrosols.

Table 7. Estimated areas of land systems with greater than 25% occupied by Ferrosols in the North Burnett area

Soils	Land System	Percentage of land system	Area (ha)
Red Ferrosols	Mulgildie	85	1734
	Yarrol	80	6193
	Glenleigh	75	670
	Coominglah	58	7630
	Hungry Hills	50	1334
	Hindmarsh 4	50	2313
	Goondicum	45	1505
	Hurdle	40	20210
	Hindmarsh 1	36	4788
	Hindmarsh 3	35	541
Brown Ferrosols	Goondicum	30	1003

Kandosols

Kandosols are soils that lack a clear or abrupt texture B horizon, are not calcareous throughout, and the B horizons are massive or only weakly structured and clay content exceeds 15%. These soils are close equivalents to the red, yellow and calcareous red earth groups of Stace *et al.* (1968) and Gn2 and many of the Um 5.2–5 soils of Northcote (1979).

These soils are not common in the area but *Bania 1* and *Wingfield 2* have significant areas of Red Kandosols with *Evergreen 1* (20%), *Torsdale* (20%) and *Hurdle* (20%) with smaller areas. *Goodnight 3* (25%) and *Clonclose 2* (40%) have significant areas of Grey Kandosols.

Land systems shown in Table 8 have greater than 25% of their area occupied by Kandosols.

Table 8. Estimated areas of land systems with greater than 25% of their area occupied by Kandosols in the North Burnett area

Soils	Land System	Percentage of land system	Area (ha)
Red Kandosols	Bania 1	70	4759
	Wingfield 2	40	1008
Grey Kandosols	Clonclose 2	40	33183

Sodosols

Sodosols are soils with clear or abrupt textural B horizons and in which the major part of the upper 0.2 m of the B2 horizon is sodic (ESP >6) and not strongly acid (pH <5.5). Suborders within the order Sodosols are also separated by colour. These soils have been described as sodic duplex soils in this report although this terminology also includes Chromosols which are sodic at depth. As other soil classification systems have used surrogate features instead of a quantitative measure of sodicity levels it is difficult to compare equivalent soils from other systems. However, solonetz, solodised solonetz and solodic soils as well as some soloths are the major groups from Stace *et al*. (1968) that are similar. Some of the duplex soils (D – primary profile forms) with conspicuously bleached A2 horizons may be equivalent in the system of Northcote (1979).

Sodosols usually have a number of adverse properties such as high ESP, high pH and high salinity levels which severely restrict infiltration rate, PAWC, ease of crop establishment and nutrient

availability with subsequent poor crop growth. The sodic horizons are readily dispersible and so these soils are prone to erosion. High management inputs are required to effectively use these soils for both cropping and pasture production.

Soils often associated with Sodosols in this area include Chromosols and Dermosols.

Brown Sodosols are the most common suborder of the Sodosols. Some of the land systems developed from sedimentary rocks (group 7) have Brown Sodosols as their major component. These include *Caswell 3, Hutton 1*, *Hutton 2*, *Hutton 3* and *Youlambie*. Brown Sodosols are also common on those land systems formed from metamorphic rocks (group 1) and include *Goodnight 2*, *Goodnight 5* and *Curtis 1*. Some of the systems on geological group 3 are also dominated by Brown Sodosols. These include *Clonclose 1*, *Clonclose 2* and *Lonepine 1*. Land systems *Crystalvale* (20%), *Raspberry*, *Moocoo* and *Mingo* developed on acid intrusive rocks (group 6) also have significant proportions of Brown Sodosols.

Yellow and Grey Sodosols dominate the land systems of *Perry 1*, *Perry 2*, *Evergreen 8* and *Goodnight 3*. Other land systems which have 20% or more of Yellow and Grey Sodosols include *Briggs 1, Cheltenham, Clonclose 1, Evergreen 4* and *Mingo*.

A limited number of land units have Red Sodosols as their major component. *Culcraigie, Caswell 2* and *Lonepine 1* are the only land systems with more than 20% of Red Sodosols with *Culcraigie* having about 50%.

Only seven land units within seven land systems have Black Sodosols as their dominant soil. The land units, usually in lower positions are part of land systems *Gaeta, Hindmarsh 4, Hutton 2, Monal 1, Nogo 3, Perry 1* and *Caswell 4.*

Land systems shown in Table 9 have greater than 25% of their area occupied by Sodosols.

Table 9. Estimated areas of land systems with greater than 25% occupied by Sodosols in the North Burnett area

Soils	Land System	Percentage of land system	Area (ha)
Brown Sodosols	Curtis 1	80	4854
	Goodnight 2	75	1818
	Hutton 2	70	14629
	Hutton 3	67	9887
	Lonepine 1	60	17971
	Clonclose 1	50	27648
	Clonclose 2	50	41479
	Goodnight 5	45	1827
	Caswell 3	40	21323
	Hutton 1	40	1268
	Ceratodus	35	3783
	Grosvenor	30	1588
	Raspberry 1	30	529
Yellow Sodosols	Perry 2	80	2270
	Perry 1	75	4280
	Rawbelle	40	15389
	Mingo	35	1224
Grey Sodosols	Evergreen 8	85	1876
	Goodnight 3	60	1447
	Evergreen 3	50	730
Red Sodosols	Culcraigie	50	10781

Tenosols and Rudosols

Tenosols and Rudosols are usually shallow soils with negligible or weak pedologic organisation. Rudosols grade to Tenosols but Tenosols in comparison to Rudosols have either a more than weakly developed A1 horizon and A2 horizon or a weakly developed B horizon. In Stace *et al.* (1968) Tenosols and Rudosols equate to lithosols, siliceous sands and alluvial soils. Some Uc, Um and Uf classes in the Factual key (Northcote, 1979) would be classified as Tenosols and Rudosols.

The Leptic suborder of Rudosols is most common in this area describing soils which have a massive or weakly structured A horizon over hard or partially weathered rock.

The most common suborder of Tenosols are Bleached-Leptic, Leptic, Orthic and Bleached-Orthic. Basically in this area, the Leptic suborder refers to soils with a structured A1 horizon over rock while the Bleached-Leptic has a bleached A2 horizon. The Orthic suborder refers to soils with a weakly developed B2 horizon or a B horizon with 15% clay or less while the Bleached-Orthic suborder is similar but contains a conspicuously bleached A2 horizon.

The Rudosols and Tenosols are usually found on the crests, upper and midslopes of the land systems with higher terrain and steeper slopes.

Leptic Rudosols occupy 25% or more of the land systems of *Boolgal*, *Caswell 4*, *Caswell 5*, *Curtis 2*, *Eagle*, *Evergreen 10*, *Lochabar*, *Muncon 3* and *Precipice*.

Bleached-Leptic Tenosols are important soils of *Aranbanga 3* (22% of the land system), *Aranbanga 5* (65%), *Caswell 5* (35%), *Gaeta* (20%), *Goodnight 2* and *5* (20%) and *Perry 2* (20%). Leptic Tenosols are common on land systems *Youlambie*, *Owlgully 2* and *Caswell 3*. Other land systems with these soils include *Nogo 3* (22%), *Ceratodus (*25%), *Caswell 1* (20%) and *Gaeta* (15%). Orthic Tenosols are the dominant soils of land systems *Hogback, Culcraigie* and *Evergreen 1*. Bleached-Orthic Tenosols are the dominant soils in 30% of land system *Evergreen 1* and *Hogback* (20%).

Land systems shown in Table 10 have greater than 25% of their area occupied by Tenosols and Rudosols.

Table 10. Estimated areas of land systems with greater than 25% occupied by Tenosols and Rudosols in the North Burnett area

Soils	Land System	Percentage of land system	Area (ha)
Leptic Rudosols	Boolgal	85	7281
	Eagle	75	5459
	Muncon 3	60	8230
	Curtis 2	60	843
	Evergreen 10	50	11045
	Precipice	30	6738
	Caswell 4	30	6757
Bleached-Leptic Tenosols	Aranbanga 5	65	10620
	Caswell 5	35	5996
Leptic Tenosols	Youlambie	60	4741
	Owlgully 2	50	1478
	Caswell 3	28	14926
Orthic Tenosols	Hogback	75	10244
	Evergreen 1	50	83
	Culcraigie	45	9703
Bleached-Orthic Tenosols	Evergreen 1	30	50

Chemical and physical attributes

Introduction

Profile chemical analyses were completed on 80 profiles throughout the survey area. Surface samples from a further 85 sites were analysed for fertility attributes.

Soils sampled for profile analyses were usually sampled at depths of 0–0.1, 0.2–0.3, 0.5–0.6, 0.8–0.9 and 1.1–1.2 m but when an important soil horizon boundary occurred within these intervals the depth of sampling was adjusted accordingly to avoid sampling across horizons. Shallower soils were sampled at the appropriate depths above the decomposing rock. A bulk sample from 8 to 10 surface samples to 0.1 m depth was collected near each site for nutrient analysis from both the sites selected for complete profile analyses as well as the additional sites for fertility analyses. Complete analytical results for the analysed sites can be obtained from DNR in either Bundaberg or Brisbane.

The samples were analysed by the Analytical Centre, Resource Sciences Centre, Indooroopilly according to the methods described by Bruce and Rayment (1982). Selected results of other analysed profiles from other projects within the study area including (Kent *et al.,* 1989) and (Smith and Kent, 1993) are included in the discussions where appropriate.

For comparison purposes, the analysed soil profiles were grouped into those eight broad geological or geomorphological divisions into which the land systems were subdivided. However, some sites from group 4 were placed with soils from group 2 as they were sampled from deeply weathered material and had greater than five percent free iron (citrate dithionate). Within these primary groups, the soil profiles were then placed in more homogenous groups based mainly on orders of the Australian Soil Classification System (Isbell, 1996).

The more relevant chemical and physical attributes of the soils are discussed. These attributes include nutrients [organic carbon (OC), nitrogen (N), phosphorus (P), potassium (K), copper (Cu), zinc (Zn)], pH, sodicity, salinity and plant available water capacity (PAWC). PAWCER, a computer model developed by Littleboy (1997), was used to estimate PAWC. The model uses -1500 Kpa moisture, clay %, silt %, coarse sand %, fine sand % and the percentage of rock in the profile to estimate the amount of water present in the soil profile available for plant growth. Effective rooting depth was taken to be 1 m or to rock if no other restrictions occurred within the profile. The influence of accumulated salt levels and the presence of high levels of sodicity were considered when determining effective rooting depth where applicable.

The attributes of the soils within the eight broad geological or geomorphological groups are discussed below. The general ratings (for example, low, medium, high) used throughout this section are from Bruce and Rayment (1982).

Group 1.	*Soils of the alluvial plains of the Burnett River, and Three Moon and Splinter Creeks including cracking clays (Vertosols) and gradational soils and non cracking clays (Dermosols) of the more recent deposits and Vertosols and sodic duplex soils (Sodosols) of the older alluvium.*

The cracking clays (Vertosols) on the more recent alluvium (*Three Moon* and *Ceratodus* land systems) have an alkaline profile trend. High salinity occurs below 0.6–0.9 m, associated with sodic to strongly sodic properties (ESP 6 to >15). Profile clay contents are high with clay contents ranging from 36–70% clay. Cation exchange capacity (CEC) of all profiles is high >30 meq/100g with calcium magnesium (Ca/Mg) ratios ranging from greater than 1 on the surface decreasing at depth.

However, profile 3MCS1, a black earth with Poplar box and Belah the dominant vegetation, has a Ca/Mg ratio <1 below 0.3 m associated with strongly sodic subsoil.

Sampled sites from cracking clays of the older alluvium (Kent *et al.,* 1989) associated with the *Grosvenor* land system generally show lower clay content and CEC than those from the more recent alluvium. Salinity is usually high (EC >0.9 dS/m) at depth associated with strongly sodic subsoils. The Ca/Mg ratio is usually greater than 1 although the soil profile class Dalgangal from the Ceratodus study (Kent *et al.,* 1989) has a ratio as low as 0.7 at depth.

pH, electrical conductivity, exchangeable sodium percentages (ESP) and Ca/Mg ratio profiles for Vertosols of group 1 on recent and older alluvium are shown in Figures 5 to 8 respectively.

The clay content in the gradational soils and non cracking clays (Dermosols) sampled on the levees and scrolls of the recent alluvium range from 10–30% for the gradational soils and from 40–50% for the non cracking clays. All profiles have neutral to alkaline subsoils (pH 6.6–8.5) with low salt contents (EC <0.15 dS/m) and most are non sodic (ESP <6) although some sites in the Ceratodus study (Kent *et al.,* 1989) become sodic (ESP 6–15) at depth. The site on sandy alluvium from fans of Hurdle Gully is sodic in the horizon with the greatest clay content.

The Sodosols on the more recent alluvium of the *Ceratodus* land system analysed for the Ceratodus study (Kent *et al.,* 1989) have an alkaline profile trend. High salinity and salt levels (EC >0.98 dS/m) occur below 0.6–0.9 m associated with strongly sodic (ESP >15) subsoils. Calcium is the dominant cation in the upper 0.3 m but the Ca/Mg ratio varies from 0.75 to 1.4 at depth. The Sodosols from the older alluvium are similar with alkaline profile trend, high salinity values at depth, strongly sodic subsoils and Ca/Mg ratios as low as 0.5 at depth.

Fertility levels of the soil of the recent alluvium are generally high with high P, K, OC and medium to high values of Zn. Carbon nitrogen (C/N) ratios of 13 to 15 also indicate high fertility levels. Generally, soils of the older alluvium are less fertile with lower P, K, OC and Zn levels.

A marked decrease in OC, total N, extractable phosphorus (P), exchangeable K and Zn values occurs between a virgin site of a black earth on recent alluvium and cultivated sites of the same soil indicating a run-down in fertility with cultivation.

The results for the surface fertility status between cracking clays on recent and older alluvia and uncultivated and cultivated sites on recent alluvium are shown in Table 11.

Table 11. A comparison of soil fertility status between cracking clays (Vertosols) on recent alluvium and on older alluvium in the North Burnett area

Soil (status)	OC %	Total N %	C/N Ratio	Extractable P µg/g	Exchangeable K	Zn µg/g
Cracking clays (Vertosols) on recent alluvium						
Virgin	3.3	0.24	13	131	1.20	3.2
Virgin	5.3	0.35	15	116	0.98	5.9
Cultivated	2.0	0.12	17	67	0.53	0.8
Cultivated	1.6	0.14	17	31	0.46	0.6
Cracking clays (Vertosols) on older alluvium						
Virgin	1.4	0.12	12	28	0.82	0.4
Virgin	2.5	0.17	15	9	0.63	0.8
Virgin	2.6	0.21	12	15	0.69	1.1

The estimated PAWC for some of the soils in group 1 are shown in Table 12 with the estimated rooting depth.

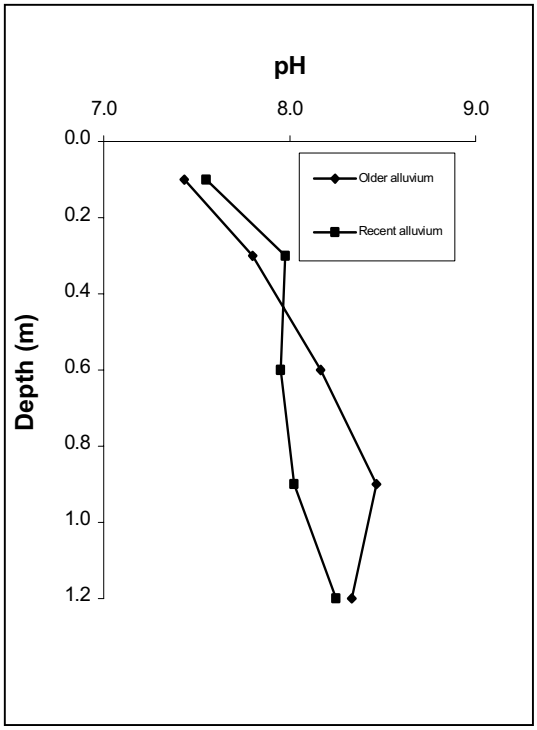

Figure 5. pH profiles for Vertosols of group 1on recent and older alluvium

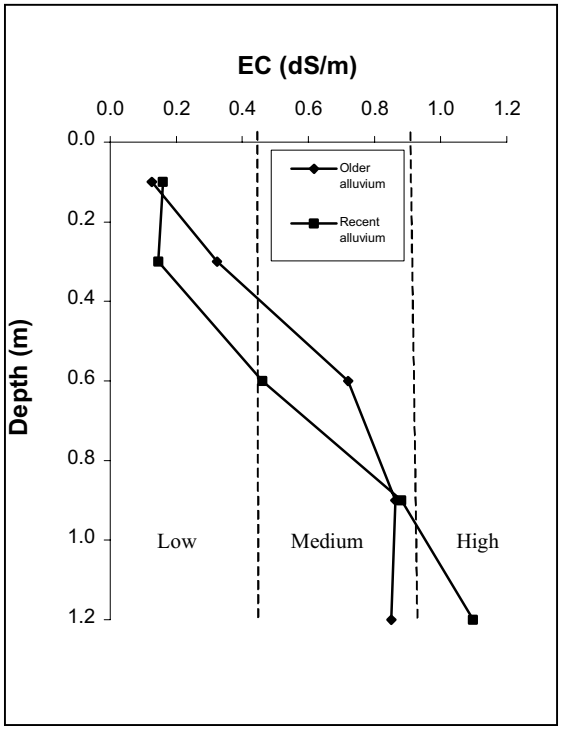

Figure 6. Electrical Conductivity (EC) profiles for Vertosols of group 1 on recent and older alluvium

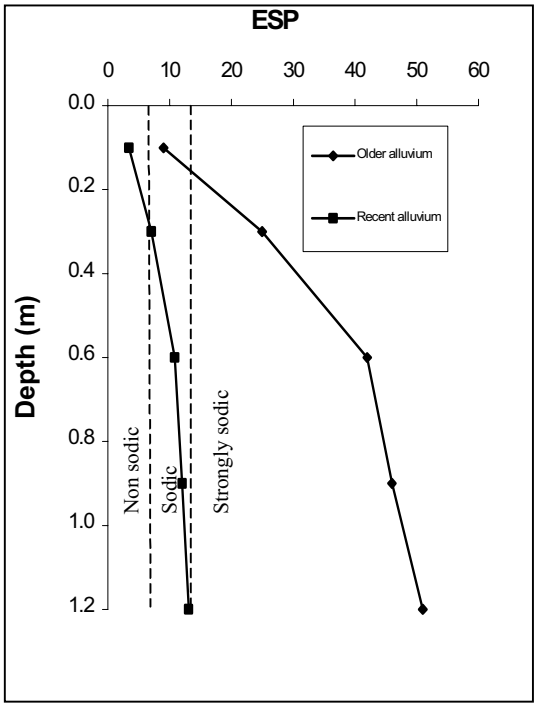

Figure 7. Exchangeable Sodium Percentage (ESP) profiles for Vertosols of group 1 on recent and older alluvium

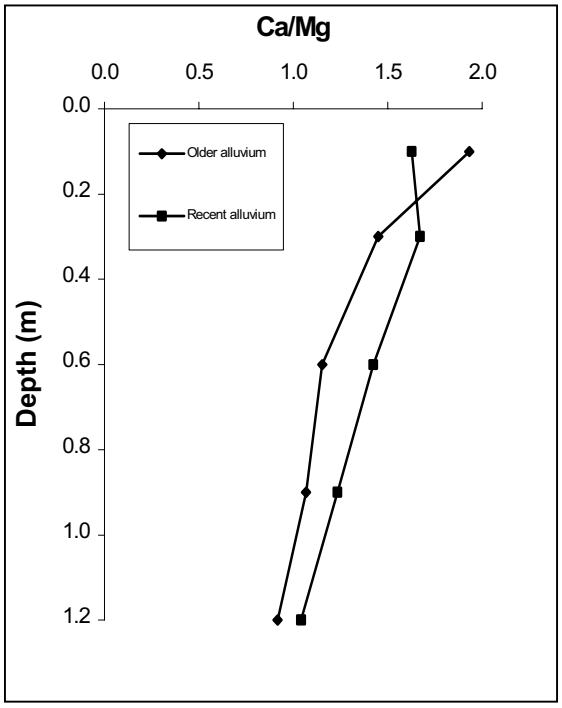

Figure 8. Ca/Mg profiles for Vertosols of group 1 on recent and older alluvium

More water is available to plants in the cracking clays (Vertosols) than the Dermosols due mainly to their higher clay content and clay type. The rooting depth of sites 3MCS1 *(Three Moon*), ABN1 *(Grosvenor)* and ABN3 *(Ceratodus)* is restricted as indicated by the accumulation of salts at these depths. Site 3MC225 *(Three Moon)* has a lower PAWC due to its lighter texture.

Table 12. The estimated plant available water capacity (PAWC) and rooting depths of the sampled sites from group 1 of the North Burnett area

Site	Land system	Principal Profile Form	Australian Soil Classification	Rooting Depth (m)	PAWC (mm)
3MCS1	Three Moon	Ug5.16	Black Vertosol	0.7	131
3MCS5	Three Moon	Ug5.16	Black Vertosol	1.0	154
3MCS2	Three Moon	Uf6.32	Black Dermosol	1.0	122
3MC225	Three Moon	Um6.31	Brown Dermosol	1.0	71
ABN1	Grosvenor	Dy2.13	Grey Dermosol	0.6	100
ABN3	Ceratodus	Gn3.43	Black Dermosol	0.9	114

Group 2. Red and brown Ferrosols (gradational soils and non cracking clays with high free iron content) on deeply weathered sediments and basic volcanic rocks usually on plateaus as well as Ferrosols from group 4.

The sampled sites for this group are all Ferrosols formed from different parent materials. Five profiles were sampled, two on deeply weathered and undifferentiated Tertiary sedimentary rocks, two on deeply weathered Tertiary basalt and one on deeply weathered gabbro.

The sites on *Goondicum* land system (gabbro) and *Glenleigh* land system (basalt) have pH profile trends varying from slightly acid to neutral (pH 6.1–7.3) with very low salinity (EC <1.15 dS/m). Subsoil clay content ranges from 50 to 63%. CEC/clay ranges from 0.45 in the surface to 0.12 in the deep subsoil indicating the presence of 1:1 kaolinitic clays with high iron and aluminium. Calcium is the dominant cation throughout the profile with low ESP. These desirable properties concur with the low values obtained for soil dispersion (R1<0.3).

The *Goondicum* site has extremely high extractable P levels on the surface (298 mg/kg) which has been confirmed by further testing. This is associated with high levels of total P (>0.7%) throughout the profile. Soils on other gabbro parent material have much lower extractable P (18 mg/kg) and profile total P (<0.06%). Phosphorus sorption characteristics would need to be examined to assess the availability of P to the plant. Organic carbon, total N, Zn, Cu and K of this profile are low to adequate for agricultural uses.

The *Glenleigh* site has very low extractable P, with medium to high organic carbon, total N, Zn, Cu and K levels.

A profile sampled on deeply weathered basalt in the *Hindmarsh 3* land system near Kalpowar was extremely acid by 0.6 m (pH 3.7). This is associated with aluminium saturation (Al/CEC%) of 72. This trend continues to depth. High salinity levels are also present below 0.6 m (EC 0.8 to 1.4 dS/m). High clay content in the subsoil ranges from 81 to 89%. Also associated with this depth are strongly sodic properties (>20 ESP). Low Ca/Mg ratios (<0.25) also exist below this depth. pH (measured by both water and $CaCl_2$ methods) below 0.6 m are equivalent which indicates this soil has some positive charge. Fertility level in the surface horizon is high for most nutrients except for Cu which is at a medium level.

Two samples from *Yarrol* and *Coominglah* land systems on deeply weathered siltstone show slightly acid to strongly acid (pH 5.1–6.5) profile trends at depth with very low salinity levels (EC <0.15 dS/m). Surface CEC values range from 8 to 10 meq/100 g at the surface to 2 to 3 meq/100g at 1.2 m. Calcium is dominant at the surface of both profiles with magnesium becoming dominant below 0.3 m to 1.2 m. Sodicity varies from non sodic (ESP<6) to sodic (ESP 6–15) throughout the profile. Fertility of these profiles is also variable (extractable P 8 to 32 mg/kg, Cu 0.17 to 3.4 mg/kg) indicating these soils may need to be tested on a site by site basis.

The PAWC of group 2 varies from 81 mm to 139 mm. The highest PAWC occurs in soils developed on the Tertiary basalt of *Glenleigh* and on gabbro in the *Goondicum* land system. The lowest PAWC is found on soils formed from the deeply weathered siltstone of *Coominglah* and *Yarrol.* Although rooting depth is restricted to 0.6 m in the soil from *Hindmarsh 3* due to the concentration of salts and the high sodicity levels, PAWC remains high (129 mm) due to the high clay content (80%) of this soil.

Table 13. The estimated plant available water capacity (PAWC) and rooting depths of the sampled sites of group 2 of the North Burnett area

Site	Land system	Principal Profile Form	Australian Soil Classification	Rooting Depth (m)	PAWC (mm)
3MCS8	Glenleigh	Uf6.31	Red Ferrosol	1.0	132
ABN194	Coominglah	Gn3.14	Red Ferrosol	1.0	81
ABN243	Yarrol	Gn3.11	Red Ferrosol	1.0	114
ABN436	Goondicum	Gn3.12	Red Ferrosol	1.0	139
ABN491	Hindmarsh 3	Gn3.14	Red Ferrosol	0.6	129

Group 3. *Sodosols and Chromosols (sodic and non sodic duplex soils) and Dermosols (gradational soils and non cracking clays) on deeply weathered and duricrusted granites and sediments on rises or hills.*

The chemistry of the five analysed sites which included Chromosols and Sodosols and Dermosols is very variable. Apart from the non cracking clay, surfaces are sandy.

Surface horizons are strongly to medium acid (pH 5.1–6.0) while the pH of the deep subsoils ranges from strongly acid to neutral (pH 5.1–7.5). Salinity levels are low to very low throughout. CEC is variable and the mean CEC/Clay ratio of 0.24 (range 0.1 to 0.4) indicates kaolonite and illite are the dominant clay minerals. The deep subsoils become non sodic to strongly sodic (ESP range 1.25 to 23.3).

Calcium is the dominant cation in the surface horizon of all soils, except for site ABN102 *(Clonclose 1),* a Sodosol with a coarse sandy surface texture, where magnesium is dominant. With the exception of site ABN99 *(Lonepine 1),* a deep Brown Dermosol growing poplar box, soils become magnesic at depth (Ca/Mg ratio <0.1).

All sites were infertile with very low to low levels of extractable P, Zn and total N and low to medium levels of K, Cu and OC.

Group 4. *Complex of soils dominated by Vertosols (cracking clays) and including Dermosols (gradational soils and non cracking clays) and Sodosols (solodic soils) on basic and intermediate intrusive and extrusive igneous rocks on rises or hills.*

Of the Vertosols (cracking clays) under a eucalypt woodland, three sites were sampled from land systems *Nogo 2,* three from *Muncon 2* and one each from *Delubra 2, Hindmarsh 2* and *Goondicum*.

pH of the cracking clays under eucalypt species ranges from neutral to alkaline on the surface to moderately to strongly alkaline (pH 7.9–9.0) at depth. Salinity levels are low (EC < 0.45 dS/m) in the upper 0.6 to 0.9 m of all profiles and low levels continue to depth in sites from land system *Nogo 2* and *Hindmarsh 2*. Medium salinity levels (EC 0.45–0.9 dS/m) are found at depth in other profiles. Clay content ranges from 42 to 72%. Calcium is the dominant cation to 0.9 m and deeper in most profiles. However, Mg is dominant throughout in site 493S in the *Muncon 2* land system and below 0.3 m in site 41 of the *Nogo* land system. Most soils are non sodic in the upper 0.6 m with only one of the sampled profiles (ABN364, land system *Delubra 2*), being strongly sodic (ESP >15) at depth. Profile dispersion trends are all low except for ABN364 which is moderate (R_1 = 0.65) at depth.

These soils are generally associated with linear gilgai microrelief with all sites sampled in the depression, apart from Site 41 which was sampled from the mound. Nutrient levels including organic C, total N, extractable P, Cu and Zn were all lower on the mound than the depression. However, K levels were higher, 0.72 meq/100 g compared to 0.26 meq/100 g in the depressions. McDonald and Baker (1986) in comparison of mounds and depressions in their Emerald study also showed that extractable P was significantly lower in the mounds than the depressions.

Of the cracking clays growing Brigalow-"softwood scrub" species, two sites were sampled from each of land systems *Narayen* and *Delubra 1*. The fifth site was sampled from *Hindmarsh 1* on Tertiary basalt.

Profile pHs for the four profiles from the *Narayen* and *Delubra 1* land systems range from neutral to moderately alkaline (pH 6.6–8.4) at the surface to strongly alkaline (pH 8.5–9.0) at depth. The soils are non saline (EC <0.45 dS/m) above 0.6 m with medium levels below except for site ABN44 which remains low throughout.

The upper profiles are Ca dominant with Mg increasing at lower depths. Except for site 44, profiles become sodic (ESP 6–15) at 0.3 to 0.6 m and become strongly sodic (ESP >15) below 0.9 m. Site 44 remains non sodic (ESP <6) throughout. This profile also has a higher CEC (>50 meq/100 gm) compared to the other profiles (range 30 to 40 meq/100 gm).

Site ABN301 on the *Hindmarsh 1* land system has a very strongly acid subsoil (pH 5.1–5.5) at 0.9 m and generally shows different properties to the alkaline subsoils described above. This soil has similar clay percentage profile but salinity below 0.3 m is medium to high even though the site was in an upper slope position. Maximum EC was 1.6 dS/m at 0.9 m. Also below 0.3 m this soil is strongly sodic with an ESP of 17 at 0.6 m. CEC/clay (>0.9) indicates high amounts of smectite present in the profile. Calcium levels are high (37 at 0.1 m to 21 at 1.2 m). Ca/Mg ratio decreases from 1.9 at the surface to 0.8 at 1.2 m. This site sampled under a virgin forest has high fertility with high OC, total N, exchangeable P, K and Zn.

Profile differences in pH, EC, ESP and Ca/Mg ratio are shown in Figures 9 to 12 for the site (site 301) with an acid subsoil and the mean of the Vertosols with alkaline subsoils.

Two sites representing Dermosols (non cracking clays) under brigalow-"softwood scrub" species, were sampled, in the *Nogo 1* land system and in the *Hindmarsh 1* land system.

pH values at the surface ranges from 6 to 7 increasing from mildly to strongly alkaline (pH 7.4–9.0) at depth. The soils have low salinity (EC <0.45 dS/m) values throughout. The soils are non sodic at the surface becoming sodic at depth. Calcium is the dominant cation at the surface and at depth for site 326 *(Hindmarsh 1)* while site 331 *(Nogo 1)* becomes magnesium dominant at depth.

The results of the analysis of the two Dermosols under eucalypt vegetation, one on lower slopes of *Delubra 2* and one on the midslopes of *Owlgully 1*, showed that pHs on the surface are neutral and become alkaline at depth. Salinity is very low to low throughout.

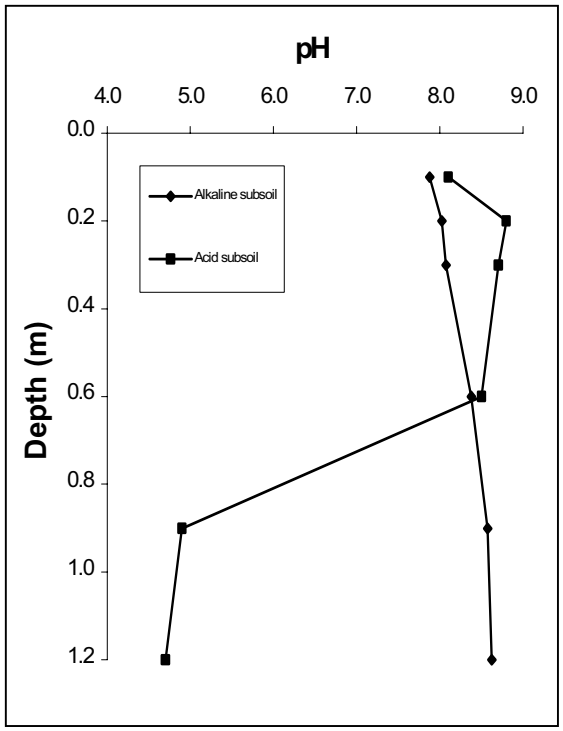

Figure 9. pH profiles for Vertosols of group 4 under "softwood scrub" species with acid and alkaline subsoils

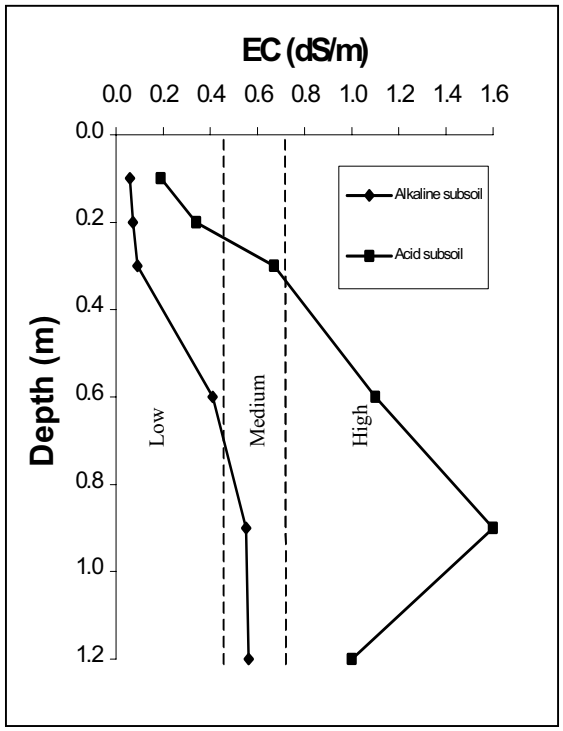

Figure 10. Electrical conductivity (EC) profiles for Vertosols of group 4 under "softwood scrub" species with acid and alkaline subsoils

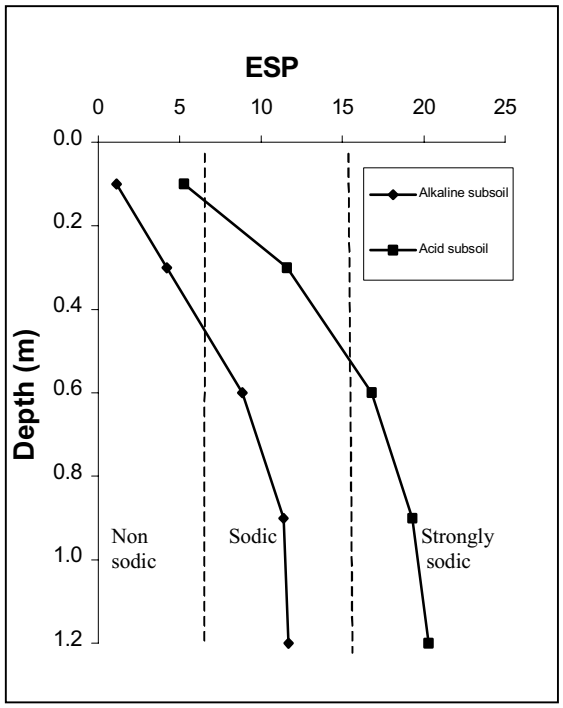

Figure 11. Exchangeable Sodium Percentage (ESP) for Vertosols of group 4 under "softwood scrub" species with acid and alkaline subsoils

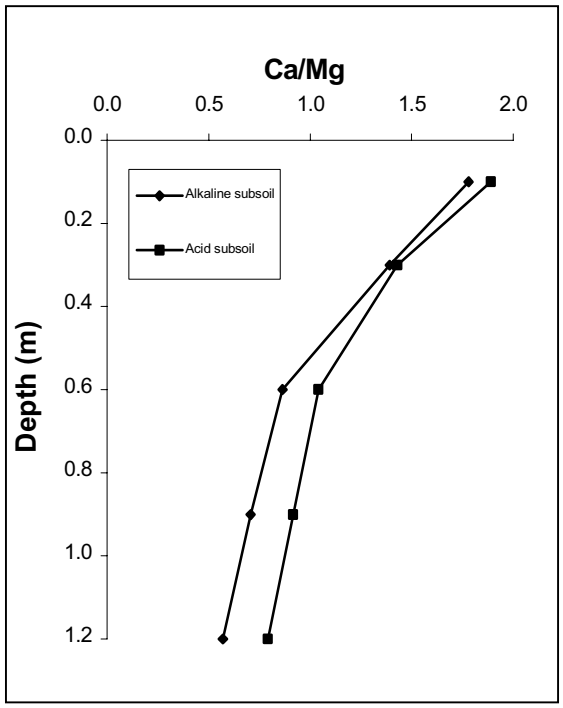

Figure 12. Ca/Mg profiles for Vertosols of group 4 under "softwood scrub" species with acid and alkaline subsoils

Both soils have low sodicity levels although the site from *Delubra 2* becomes sodic (ESP 8.6) at 1.2 m. Although the surfaces of both soils are calcium dominant, magnesium becomes dominant below 0.3–0.6 m.

Three sites representing Chromosols and Sodosols under eucalypt vegetation from land systems *Nogo 2, Delubra 2* and *Narayen* were sampled for analyses.

These soils have neutral to mildly alkaline (6.6–7.8) surface pHs and become strongly alkaline (8.5–9.0) at depth. Salinity levels are low on the surface with low to medium levels at depth. The site from *Narayen* land system with a red subsoil is non sodic throughout while the other two sites become sodic (ESP 6–15) by 0.6 m. With the exception of the *Narayen* site, magnesium is the dominant cation at depth while magnesium is dominant throughout in *Delubra 2*.

Profile differences between Vertosols and Dermosols growing either "softwood scrub" species or eucalypt species and duplex soils (Sodosols and Chromosols) growing eucalypt species for electrical conductivity (EC), exchangeable sodium percentage (ESP) and Ca/Mg ratio are shown in Figures 13 to 15.

Surface samples from 33 sites under eucalypt vegetation and 13 under brigalow-"softwood scrub" species were analysed for fertility status.

Results were extremely variable but generally "scrub" sites and more fertile than those under eucalypt species. Mean values for extractable P, K and Zn with the range and standard deviation (SD) are shown in Table 14.

Table 14. Mean values of extractable phosphorus (P_B), potassium (K) and zinc (Zn) for "scrub" sites and eucalypt sites for soils of group 4, North Burnett area

	P_B µg/g			**K meq/g**			**Zn µg/g**		
	Mean	**Range**	**SD**	**Mean**	**Range**	**SD**	**Mean**	**Range**	**SD**
"Scrub" sites	63	8–116	43	1.3	0.33–2.3	0.5	4.4	0.5–15	4.0
Eucalypt sites	29	2–90	27	0.71	0.05–0.19	0.38	1.6	0.02–7.3	1.6

Although variability is high, the mean value of 63 mg/kg for extractable P for the "scrub" sites is much higher than the mean value of 29 mg/kg for the eucalypt sites. Of the 13 "scrub" sites only four have very low to low values (<10–20 mg/kg) compared to 21 sites from the 33 sites analysed for the eucalypt sites.

The variability for K is less than that for P as only two sites have less than medium levels of K (>0.2 meq/100 g) for both the "scrub" and eucalypt sites. Twenty two eucalypt sites have high values (0.5–1.0 meq/100 g) while 10 of the 13 "scrub" sites sampled have very high values (>1.0 meq/100g).

"Scrub" sites have medium to high OC levels with a mean of 3.3% (range 2 to 4.4%) while sites under eucalypt species had a mean of 2.1% (range 1 to 4.4%). Total N is also higher in the "scrub" sites with a mean of 0.27% (range 0.16 to 0.41%) compared to the eucalypt sites with a mean of 0.15% (range 0.03 to 0.28%).

The trace elements Zn and Cu are usually in the medium to high range for both groups with some low values for Zn in the soil under eucalypt species.

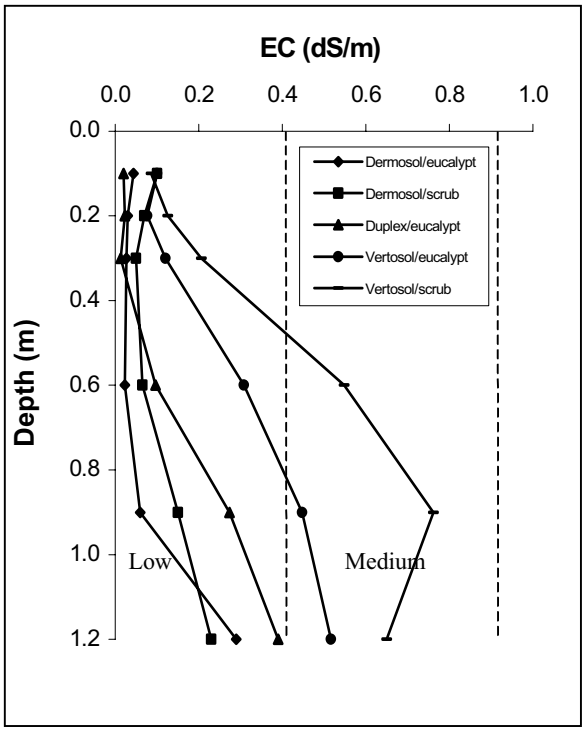

Figure 13. Electrical conductivity (EC) profiles for Vertosols and Dermosols under "softwood scrub" species and eucalypt species and duplex soils (Sodosols and Chromosols) under eucalypt species

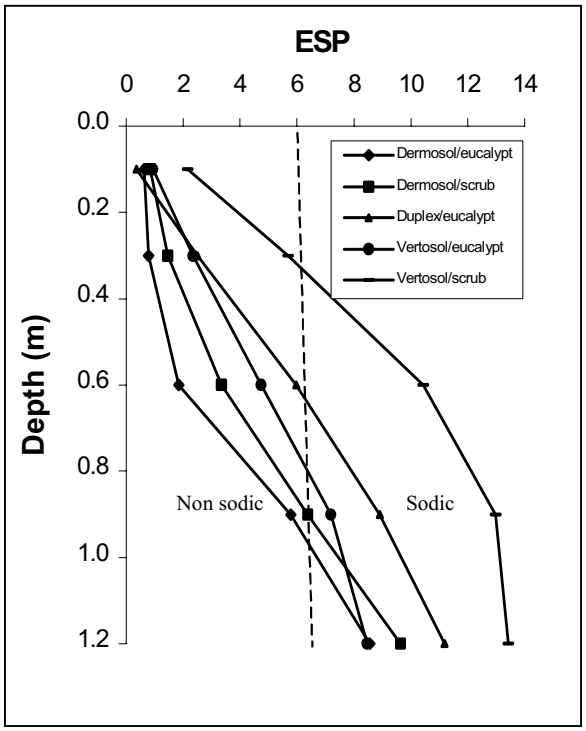

Figure 14. Exchangeable Sodium Percentage (ESP) profiles for Vertosols and Dermosols under "softwood scrub" species and eucalypt species and duplex soils (Sodosols and Chromosols) under eucalypt species

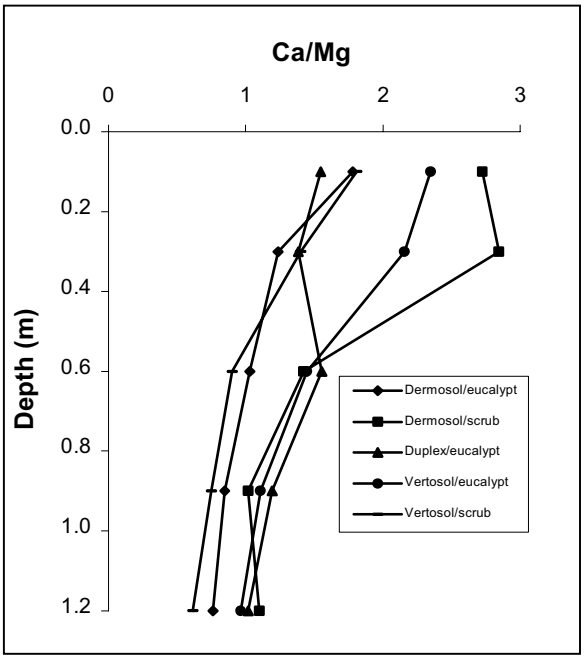

Figure 15. Ca/Mg profiles for Vertosols and Dermosols under "softwood scrub" species and eucalypt species and duplex soils (Sodosols and Chromosols) under eucalypt species

The estimated PAWC is shown for a range of Vertosols (cracking clays) covering a number of land systems from group 4 in Table 15. PAWC ranges from 80 mm to 163 mm, the lower values due usually to the shallower rooting depth. Although ABN161 has a rooting depth of 1.0 m, the lower clay content below 0.6 m (17%) contributed to the lower PAWC. The depth to which water penetrates in some of these soils is indicated by the accumulation of salts and/or accompanied by high sodicity levels. Site ABN301 has high salt levels by 0.4 m, hence restricting rooting depth, while ABN23 and 364S have rooting depths of 0.6 m.

Table 15. Estimated plant available water capacity (PAWC) and rooting depths for Vertosols of group 4 of the North Burnett area

Site	Land system	Principal Profile Form	Australian Soil Classification	Rooting depth (m)	PAWC (mm)
ABN19	Narayen	Ug5.16	Black Vertosol	0.7	120
ABN23	Narayen	Ug5.13	Black Vertosol	0.6	89
ABN41	Nogo 2	Ug5.34	Black Vertosol	1.0	148
ABN42	Nogo 2	Ug5.16	Black Vertosol	1.0	156
ABN80	Nogo 2	Ug5.15	Black Vertosol	1.0	142
ABN93	Delubra 1	Ug5.34	Brown Vertosol	1.0	159
ANB161	Nogo 1	Ug5.14	Black Vertosol	1.0	103
ANB170	Hindmarsh 2	Ug5.15	Black Vertosol	1.0	160
ABN301	Hindmarsh1	Ug5.28	Grey Vertosol	0.4	80
ABN430	Goondicum	Ug5.16	Black Vertosol	0.9	163
ABN364S	Delubra 2	Ug5.15	Black Vertosol	0.6	103
ABN493S	Muncon 2	Ug5.1	Black Vertosol	1.0	150

Group 5. Complex of soils dominated by Dermosols (non cracking clays and gradational soils) and Sodosols and Chromosols (sodic and non sodic duplex soils) on acid volcanic rocks.

No sites were sampled for full laboratory characterisation but detailed analysis of surface samples were completed on sites from land systems *Torsdale* and *Aranbanga 1, 2, 3* and *5*.

Surface textures range from loamy sand to light clay. Cation exchange capacity is usually related to texture, with the light clay surfaces having a CEC of 14 meq/100 g, and sandy loam to loamy sand surfaces CEC of 2 to 4 meq/100 g. The soils with clay loam surfaces ranged from 4 to 8 meq/100 g.

The pHs of the surface samples are medium to slightly acid (pH 5.6–6.5) with very low salinity (EC <0.15 dS/m). Calcium is the dominant cation. The samples are non sodic.

Site 806 from *Aranbanga 1* under "softwood scrub" species is more fertile than the other sites. Exchangeable P is very low for all sites except site 806 which has high levels (27 meq/g). Site 806 has medium carbon levels (1.8%) while the other sites have low to medium levels. It also has medium levels of total N while the others have very low to low levels. Copper and zinc (Zn) is low to medium in all sites (0.66 meq/100 g). Most sites have medium levels of K although site 51 of *Torsdale* land system was low and site 806 high.

Group 6. Tenosols (siliceous sands), and Chromosols and Sodosols (sodic and non sodic duplex soils) on acid intrusive rocks.

The eighteen sites sampled on acid intrusive rocks were either duplex soils (Sodosols or Chromosols) or siliceous sands (Tenosols). Land systems in which the sites were sampled included *Rawbelle, Cheltenham, Coonambula, Eidsvold, Culcraigie, Wingfield, Briggs 1, Wolca 1, Perry 1, Crystalvale*

and *Nour*. All soils had sandy surface textures with clay content ranging from 8 to 12% except for site 766 *(Wolca 1)* and 830 *(Crystalvale)* with clay contents of 23% and 21% respectively. Except for the Tenosols (from *Rawbelle* and *Culcraigie* land systems) clay content increased in the B horizons which commenced at an average depth of 0.42 m with a range between 0.15 to 0.8 m. The particle size analyses showed that the clay content difference between the A and B horizons, often only 10–15%, did not always correspond to the field texture determinations which were usually higher in clay estimation. Clay percentages in the B horizons of the duplex soils ranged from 22 to 63%.

The pHs range from medium acid to neutral (pH 5.6–7.3) at the surface but strongly acid to strongly alkaline (pH 5.1–9.0) at depth. Low to very low salt levels occur throughout the profile. Ten of the 16 duplex profiles analysed become sodic to strongly sodic (ESP 6–>15) at depth, seven profiles by 0.6 m.

Calcium is the dominant cation on the surface of all soils and remains dominant throughout for six sites including the two Tenosols. Four profiles (Sites ABN111 *[Culcraigie]*, ABN766 *[Wolca 1]*, ABN16 *[Rawbelle]* and ABN37 *[Coonambula]*) become strongly magnesium dominant (range 0.11 to 0.15) at depth.

Of the 36 samples analysed for nutrients, 25 were low to very low in exchangeable P (<20 mg/kg) with 15 very low (<10 mg/kg). The other 11 sites had a mean value of 32 mg/kg with a range between 23 and 58 mg/kg.

Zinc values ranged from 0.2 to 6.5 μg/g with 86% of the sites lying in the range 0.2 to 2.0 μg/g. Copper values ranged, from 0.1 to 13 μg/g; however, only three sites ABN828, 787 and 751, all from land system *Wonbah,* had values >6 μg/g. Low to medium levels of organic carbon were present in the samples with one site having very high levels (site 787). Total N varied from 0.03 to 0.13% with site 787 having the higher value of 0.39%. Most sites had medium levels of extractable K (0.2–0.5%) with five sites having low values and nine sites with high values.

The PAWC of the soils sampled in group 6 is given in Table 16.

PAWC of this group of soils is generally lower than that of other groups. Factors which have an influence on PAWC of these soils include the sandy textures, deep A horizons, shallow depth to granite and the accumulation of salts, accompanied by high sodicity levels. Except for site ABN766, PAWC ranges from 58 mm to 80 mm and rooting depths from 0.7 to 1.0 m. The B horizon texture of site ABN766 is much heavier (clay >50%) than the other sites and begins at a much shallow depth (0.15 m) which influences the PAWC at this site.

Group 7. *Complex of soils dominated by Vertosols (cracking clays) and Dermosols (non cracking clays) and Sodosols and Chromosols (sodic and non sodic duplex soils) on sedimentary rocks.*

Vertosols are an important group of soils within this broad geological grouping and support brigalow-"softwood scrub" species and eucalypt species. Vertosols with alkaline subsoils and those with acid subsoils under brigalow-"softwood scrub" species are present in this geological group and were sampled for comparison.

Two sites with alkaline subsoils were sampled on land system *Monto* with one each from *Evergreen 4* and *5*. Another site from Smith and Kent (1993) in the *Monto* land system is included in the discussion of the soils with alkaline subsoils.

Table 16. Estimated plant available water capacity (PAWC) and rooting depths of the sampled sites from group 6 in the North Burnett area

Site	Land System	Principal Profile Form	Australian Soil Classification	Rooting Depth (m)	PAWC (mm)
ABN16	Rawbelle	Dg3.43	Grey Sodosol	0.7	70
ABN29	Cheltenham	Dy2.42	Brown Chromosol	1.0	72
ABN32	Cheltenham	Dy3.41	Grey Chromosol	1.0	64
ABN37	Coonambula	Db2.43	Brown Sodosol	0.7	61
ABN39	Coonambula	Db2.42	Brown Chromosol	1.0	80
ABN86	Eidsvold	Dr2.42	Red Sodosol	0.8	63
ABN113	Rawbelle	Uc4.11	Orthic Tenosol	1.0	64
ABN119	Culcraigie	Uc4.12	Orthic Tenosol	1.0	65
ABN151	Wingfield 1	Db1.22	Brown Chromosol	0.9	63
ABN153	Wingfield 1	Dy3.22	Brown Chromosol	0.8	62
ABN749	Briggs 1	Dy2.42	Yellow Sodosol	0.8	62
ABN766	Wolca 1	Dr2.11	Red Chromosol	0.9	122
ABN768	Wolca 1	Dy2.42	Brown Chromosol	0.9	72
ABN812	Perry 1	Dg2.41	Grey Sodosol	0.7	58
ABN830	Crystalvale	Db1.33	Brown Chromosol	0.8	78

Two sites with acid subsoils were sampled in the *Monto* land system. One from the *Trapyard* land system had a neutral subsoil by 1.2 m but it was suspected to become acid below. This was supported by a shallower site nearby which became acid (pH 5.8) at 1.2 m.

The pHs of the surface of the acid group are neutral to mildly alkaline (pH 6.6–7.8) while the surface pH of the alkaline subsoil group are more variable and range from slightly acid to moderately alkaline (pH 6.1–8.4). The soils with alkaline subsoils have low to medium salinity levels (EC 0.15–0.9 dS/m) throughout the profile associated with non sodic surfaces with sodic levels at depth. The soils with acid subsoils have high to very high salinity levels (EC 0.9–>2 dS/m) below 0.6 m, at least sodic by 0.3 m and strongly sodic below (maximum ESP of 44).

The soils with alkaline subsoils are usually calcium dominant throughout (*Evergreen 4* becomes magnesium dominant at depth), while the soils with acid subsoils have strong magnesium dominance by 0.3–0.6 m.

The differences between the major properties of Vertosols with acid subsoils and alkaline subsoils are shown in Figures 16 to 19.

Vertosols formed from sedimentary rocks under eucalypt species were sampled from land system *Cannindah* (limestone) and the *Harrami* land system. The Harrami site was only 0.55 m to decomposing rock, while the Cannindah site was deep (>1.5 m). These soils were neutral on the surface and moderately to strongly alkaline (pH 7.0–9.0) at depth. Both soils had low salinity levels (EC 0.15–0.45 dS/m) although the deeper profile had medium salinity levels at depth.

The shallow soil is non sodic (ESP <6) throughout while the deeper profile becomes sodic by 0.9 m. Both soils are strongly calcium dominant.

Five Sodosols (sodic duplex soils) were sampled in this soil group. Two profiles from each of land systems *Caswell 2* and *Hutton 2* were on hillslopes while site ABN677 was in a valley flat of *Caswell 4.*

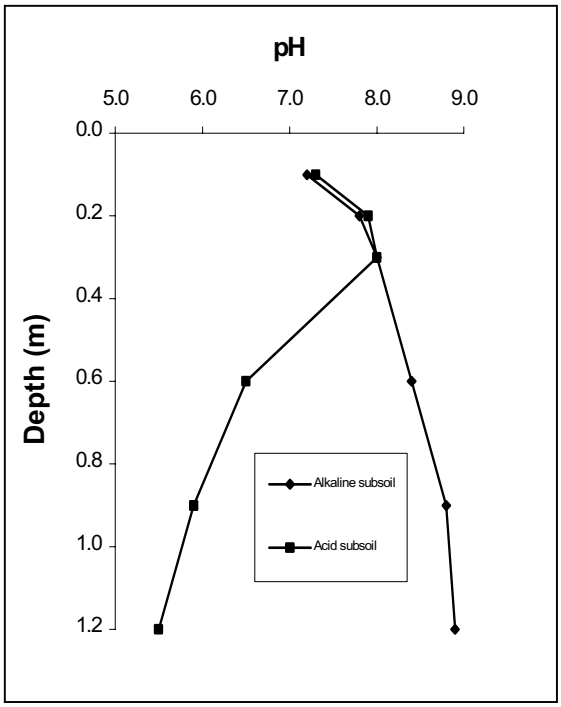

Figure 16. pH profiles for Vertosols of group 7 for *Monto* and *Trapyard* land systems with acid and alkaline subsoils

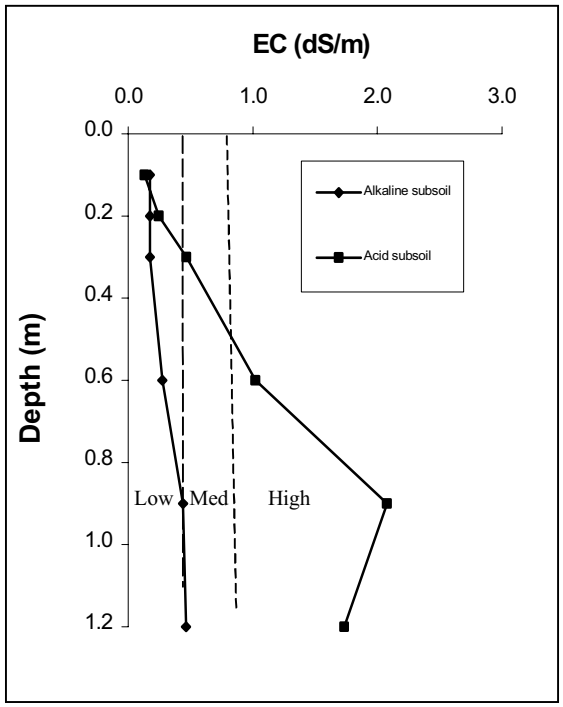

Figure 17. Electrical conductivity (EC) profiles for Vertosols of group 7 for *Monto* and *Trapyard* land systems with acid and alkaline subsoils

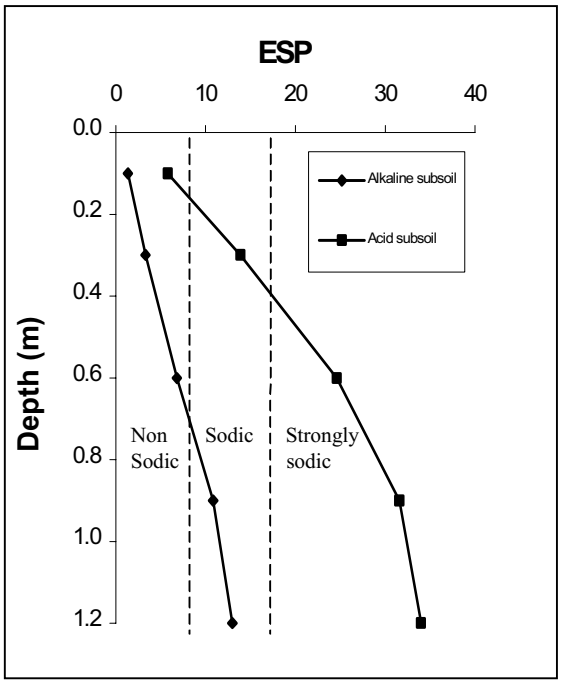

Figure 18. Exchangeable Sodium Percentage (ESP) profiles for Vertosols of group 7 for *Monto* and *Trapyard* land systems with acid and alkaline subsoils

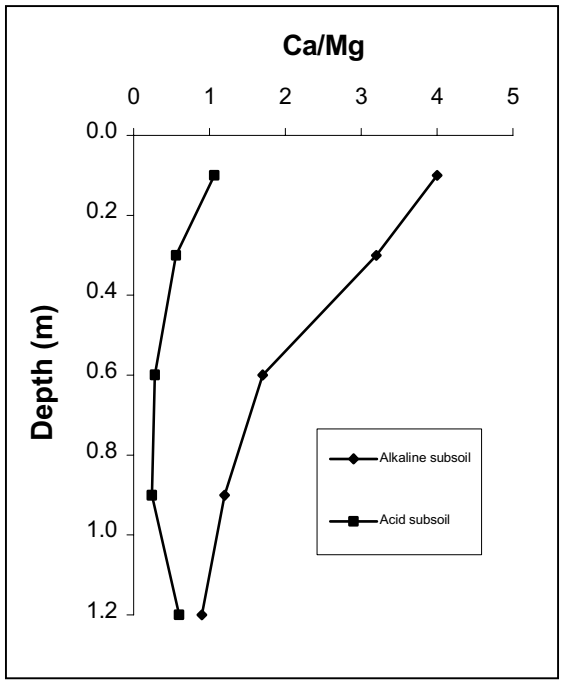

Figure 19. Ca/Mg profiles for Vertosols of group 7 for *Monto* and *Trapyard* land systems with acid and alkaline subsoils

pHs in the deep subsoils range from mildly alkaline (pH 7.4–7.8) on the shallower, steep (15%) hillslope site *(Caswell 2)* to strongly alkaline (pH 8.5–9.0). Low to medium levels of salinity (EC 0.15–0.9 dS/m) are encountered below 0.3 m. The upper B horizon of all sites is sodic (ESP 6–14) increasing to strongly sodic (ESP >15) at depth in all sites except the site on the valley flat. Those soils on the *Hutton* land system have the highest ESP level at depth (ESP >40). Magnesium is the dominant cation in the B horizon of all soils except for the Black Sodosol on the valley flat in which calcium is dominant throughout.

Two sites representing Dermosols supporting "softwood scrub" species were sampled on *Caswell 1* land system, one supporting Brigalow on *Kapaldo* land system, one on mixed eucalypt-"softwood scrub" species from the *Evergreen 6* land system and the fifth site was from the *Caswell 2* land system supporting Poplar box.

The sampled sites showed large variations in properties even within the same land systems.

A Brown Dermosol on the *Caswell 1* land system (site 250) showed an alkaline profile trend with low salinity and low sodicity levels throughout the profile. Calcium is strongly dominant on the exchange complex. These properties were similar to the shallower site (site 669) on the *Evergreen 6* land system.

The pH trend of the other site (ABN410) on the *Caswell 1* land system as well as the Grey Dermosol on *Kapaldo* land system (3MCS6) ranges from mildly to strongly alkaline (pH 7.4–9.0). Salinity levels are high to very high (EC 0.9–>2.0 dS/m) by 1.2 m associated with strongly sodic properties. Calcium is the dominant cation to 0.6 to 0.9 m with magnesium dominant below this depth. Similar properties were shown by ABN site 264S growing Poplar box on *Caswell 2* land system.

The mean of some of the chemical properties of sites 410, 3MCS6 and 264S (Dermosols A on graphs) with those of sites 250 and 669 (Dermosols B on graphs) as well as those for the Sodosols (excluding ABN677 on valley flat of *Caswell 4*) are shown in Figures 20 to 23 to show their contrasting chemical properties.

Fifteen sites from soils growing brigalow-"softwood scrub" species and 26 sites growing eucalypt species were selected for nutrient analyses.

Large variations occurred in the results even within the same land systems and this is demonstrated in Table 17 which gives the mean values, range and standard deviations (SD) for some of the nutrients for both the "scrub" and eucalypt sites.

Table 17. Mean values of extractable P (P_B), potassium (K), and zinc (Zn) for "scrub" sites and eucalypt sites for soils of group 7, North Burnett area

	P_B µg/g			**K µg/g**			**Zn µg/g**		
	Mean	**Range**	**STD**	**Mean**	**Range**	**STD**	**Mean**	**Range**	**STD**
"Scrub" sites	69	25–143	41	1.3	0.78–2.3	0.5	7.5	2.6–28	6.2
Eucalypt sites	22	2–84	21	0.7	0.19–2.1	0.4	4.5	0.85–31	6.3

Generally, the "scrub" sites are more fertile than those sites under eucalypt species. Although large variations occur, the range is not as wide in the "scrub" sites. The mean values for the "scrub" sites for P, Zn, Cu and K are 69 µg/g, 7.5 µg/g, 2.2 µg/g and 1.4 µg/g respectively. This compares with values of 22 µg/g, 4.5 µg/g, 16 µg/g and 0.7 µg/g for the same elements for the eucalypt sites. Organic C and Total N values range from 1.3–5.1% and 0.12–0.48% respectively for the "scrub" sites and 1.1–5.1% and 0.5–0.23% for the eucalypt sites.

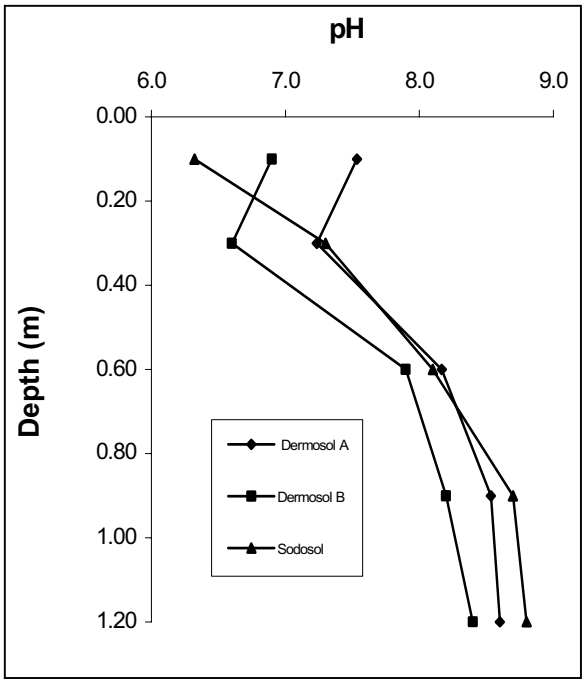

Figure 20. pH profiles for contrasting Dermosols and Sodosols of group 7

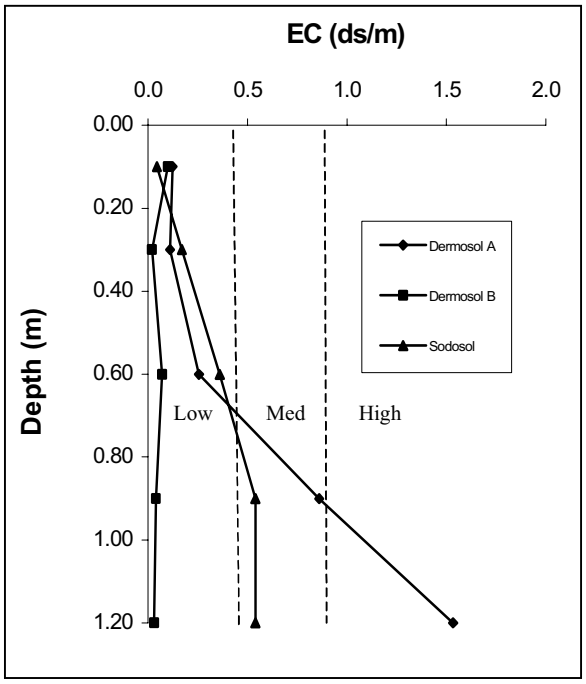

Figure 21. Electrical conductivity (EC) profiles for contrasting Dermosols and Sodosols of group 7

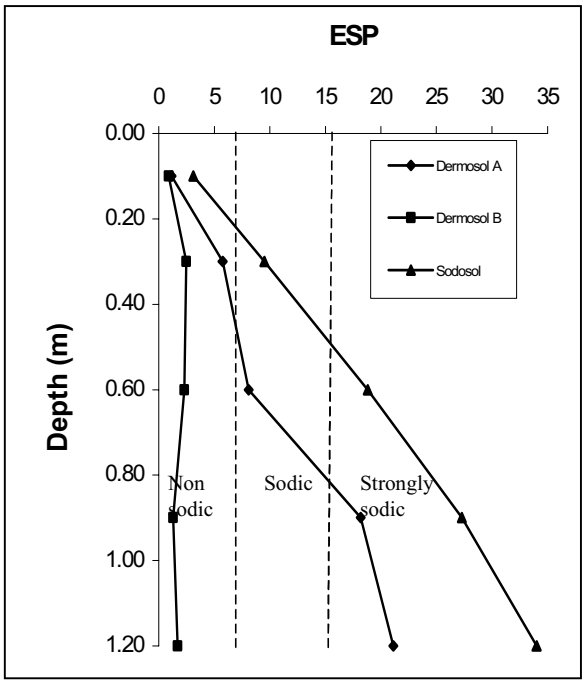

Figure 22. Exchangeable Sodium Percentage (ESP) profiles for contrasting Dermosols and Sodosols of group 7

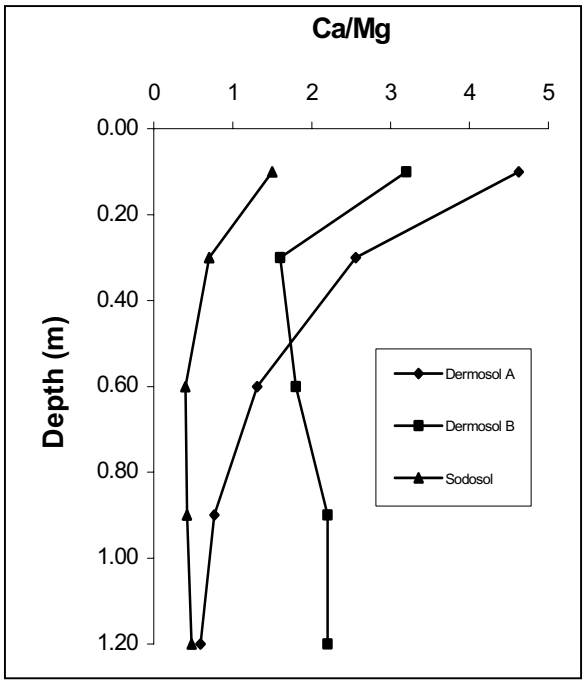

Figure 23. Ca/Mg profiles for contrasting Dermosols and Sodosols of group 7

PAWC for Vertosols, Dermosols and Sodosols for group 7 are shown in Table 18.

Table 18. Estimated plant available water capacity (PAWC) and rooting depths of the sampled sites from group 7 of the North Burnett area

Site	Land System	Principal Profile Form	Australian Soil Classification	Rooting Depth (m)	PAWC (mm)
3MCS6	Kapaldo	Uf6.33	Brown Dermosol	0.6	82
ABN250	Caswell 1	Uf6.31	Brown Dermosol	1.0	106
ABN264S	Caswell 2	Uf6.31	Brown Dermosol	0.7	102
ABN410	Caswell 1	Uf6.31	Brown Dermosol	0.8	107
ABN669	Evergreen 6	Uf6.34	Brown Dermosol	0.6	77
3MC219	Hutton 2	Dy2.43	Grey Sodosol	0.4	59
ABN251	Caswell 2	Db1.43	Brown Sodosol	0.7	89
ABN663	Caswell 2	Db1.42	Brown Sodosol	0.4	62
ABN673	Caswell 4	Dd1.43	Black Sodosol	1.0	142
ABN831	Hutton 2	Db1.43	Brown Sodosol	0.4	57
3MCS3	Monto	Ug5.22	Grey Vertosol	1.0	137
3MCS4	Evergreen 5	Ug5.33	Brown Vertosol	1.0	154
3MCS7	Monto	Ug5.24	Grey Vertosol	0.4	81
3MC153	Cannindah	Ug5.1	Black Vertosol	1.0	144
3MC187	Monto	Ug5.33	Brown Vertosol	1.0	135
ABN228	Monto	Ug5.24	Grey Vertosol	0.6	87
ABN355	Harrami	Ug5.37	Red Vertosol	0.6	111
ABN637	Evergreen 4	Ug5.33	Brown Vertosol	0.8	122
ABN829	Trapyard	Ug5.25	Grey Vertosol	0.4	80

For the Vertosols, PAWC varied from 80 mm to 154 mm. The lower PAWC of about 80 mm for site 3MCS7 and ABN829 is due to the shallow rooting depth of 0.4 m. These sites have an accumulation of salts at this depth and associated ESP indicating the depth to water penetration. The sites with a rooting depth of 1 m have no restrictions in the profile. Site ABN355, although only 0.55 m deep to rock, have a comparatively high PAWC (111 mm) due to the high clay content (>70%).

Estimated PAWC of the Dermosols varied from 77 mm to 107 mm. The low PAWC of site ABN669 (77 mm) is due to the shallow depth to sandstone (0.6 m). The rooting depths of 3MCS6, ABN264S, ABN410 are estimated to be less than 1 m due to the accumulation of salts.

The depth to accumulated salts and associated high ESP levels determined the rooting depth of Sodosols. These depths ranged from 0.4 to 0.7 m except for site ABN673. Site ABN673 was sampled in the valley flat of land system *Caswell 4* in which water accumulates. No restrictions to the rooting depth was apparent at this site as sodicity levels were lower than the other sites and no salt bulge occurred within the profile. PAWC of other sites ranged from 59 to 89 mm due to the shallower rooting depth indicated by the accumulation of salts at 0.4 and 0.7 m.

Group 8. *Tenosols (shallow uniform medium textured soils) and Sodosols (sodic duplex soils) on metamorphic rocks.*

Two sites on midslopes were fully analysed in Group 8 on land systems *Goodnight 2* and *Curtis 1*. A further two sites were sampled for nutrient analyses from *Goodnight 1* ("softwood scrub") and *Goodnight 5* and a further site for cations from *Curtis 1*.

The soils sampled were sodic duplex soils (Sodosols) with strongly sodic (ESP >15) B horizons. Surface horizons were medium acid to neutral (pH 5.6–7.3) and become mildly to moderately alkaline (pH 7.4–8.4) at depth. Salinity is very low to low throughout.

The mean ratio of Ca/Mg in the B horizon is 0.037. The dominance of Na and Mg on the exchange complex indicates their poor physical properties although the R1 ratio (a measure of dispersion) of 0.88 and 0.56 was expected to be higher.

With the exception of site ABN840 *(Goodnight 1)* on "softwood scrub", the soils have low to very low levels of OC, total N and exchangeable P and low to medium levels of K, Cu and Zn. In comparison, ABN840 has high values of OC, exchangeable P and medium levels of total N, Zn and Cu.

Land capability

Introduction

The land capability classification of Rosser *et al.* (1974) was used to assess the land units of each land system for agricultural, pastoral and non agricultural uses. Agricultural use implies cultivation and rainfed cereal cropping while pastoral use implies grazing of stock on improved or native pasture. Land Resources Branch Staff (1990) recommends this classification system for studies where evaluation for a wide range of agricultural land uses is required at a small scale (1:250 000 or smaller). The limiting factors of Rosser *et al.* (1974) were replaced by limitations and given the code similar to those described in Land Resources Branch Staff (1990).

The system uses eight classes with limitations and hazards to agricultural and pastoral use becoming progressively greater from Class 1 to Class VIII. The land class descriptions are shown in Table 18.

Thirteen limitations were regarded as important for the broad agricultural uses being assessed for the study. Diagnostic attributes were selected to measure or estimate each of the relevant limitations. For each limitation, critical values of the diagnostic attributes were established in order to rank the effects of the limitations in terms of increasing degree of severity. These limitation subclasses ranged from the least severe to the most severe on a scale ranging from one to eight. The capability was determined on a 1 to 8 scale usually by the most severe limitation subclass. The limitations, the diagnostic attributes and the limitation subclasses are described in Table 19. A more detailed description follows in the text.

Limitations of the land units

The limitations and subclasses were assessed for each land unit of the land systems and the land class was subsequently determined. Most land units had two classes (rarely three) due to the wide range of soil and land attributes present. The limitation subclasses and land classes for the land units are given in the description of the land systems in Appendix I. These data are also recorded on a computer database which is available at DNR, Bundaberg. The dominant and subdominant land classes for the land units of the land systems as well as the estimated percentage of the land system occupied by each land unit are shown in Appendix III.

The major limitations affecting land capability in the area are water availability (m) and erosion (e).

Water availability (m)

Crop production is highly dependent on the amount of water available to plants. Water availability refers to the limitation placed on crop yield by restriction of soil water supply. Under dryland conditions climatic and soil factors are the major determinants of the amount of water available to the crop. Climatic factors include the amount, distribution and intensity of rainfall as well as temperature, radiation and evaporation. The storage capacity of a soil is influenced by texture, structure, surface condition, soil depth, horizonation and other impediments to water entry or to plant root development.

Shields and Williams (1991) developed subclasses for plant available water capacity (PAWC) for their study in the Kilcummin area and these criteria were used in this study. PAWCs were estimated for a number of analysed sites using the model of Littleboy (1997) and are shown earlier in this document. These values were useful to estimate the moisture limitation for the land units.

Table 19. A description of the eight land capability classes used in classifying land in the North Burnett area

Land Class	Description
Class I	Land suitable for all agricultural and pastoral uses. Land is suited to a wide range of crops and is highly productive. Land presents no limitations to use of machinery or choice of implements Wind and water erosion hazard are low even under intensive cultivation.
Class II	Land suitable for all agricultural uses but with slight restrictions to use for cultivation in one or more of the following categories: Land with some limitation to the choice of crops and/or slight restrictions to productivity. Land with some impediment to the use of cultivation machinery which limits the choice of implements or restricts the conditions for successful operation. Land which under cultivation requires simple conservation practices to reduce soil loss to an acceptable level. These include agronomic practices such as contour working, strip cropping, stubble mulching.
Class III	Land suitable for all agricultural uses but with moderate restrictions to use for cultivation in one or more of the following categories: Land with moderate limitations to the choice of crops and/or moderate restrictions to productivity. Land with moderate impediment to the use of cultivation machinery which limits the choice of implements or restricts the conditions for successful operation. Land which under cultivation requires intensive conservation practices to reduce soil loss to an acceptable level. These include contour banking systems and intensive residue management involving specialised machinery.
Class IV	Land primarily suited to pastoral use but which may be safely used for occasional cultivation with careful management. Land on which the choice of crops is severely restricted and/or conditions is such that productivity under cropping is severely limited. Land with severe impediment to the use of cultivation machinery which limits the choice of implements or severely restricts the conditions for successful operation. Land which cannot be used safely for permanent cultivation. If cropped, a pasture phase must be the major component in the cropping program to limit soil loss to an acceptable level.
Class V	Land which in all other characteristics would be arable but has limitations which, unless removed, make cultivation impractical and/or uneconomical.
Class VI	Land which is not suitable for cultivation but is well suited to pastoral use and on which pasture improvement involving the use of machinery is practicable.
Class VII	Land which is not suitable for cultivation but on which pastoral use is possible only with careful management. Pasture improvement involving the use of machinery is not practicable.
Class VIII	Land which has such severe limitations that it is unsuited for either cultivation or grazing.

Effective soil depth (pd)

All crops require an adequate depth of soil to provide physical support to a plant. The effective soil depth is often the depth to hard rock but impeding layers such as hard pans, impermeable subsoils, high salinity zones and acid subsoils affect the proliferation of root growth. Effective soil depth <0.25 m was regarded as too shallow for arable land and had a limitation of pd6. Soil depths between 0.25 and 0.5 m had a pd4 limitation while those from 0.5 to 1 m had a pd3 limitation.

Surface condition (ps)

The establishment of a uniform stand of desired density is important for successful crop and improved pasture production. Germination, seedling emergence, crop establishment and the spread of introduced pastures may be affected by adverse physical conditions of the soil surface. The adverse climatic conditions especially during the summer crop planting period necessitates that adequate seed soil contact is available to prevent desiccation prior to germination and establishment.

Table 20. A brief description of the diagnostic attributes used to determine the limitation subclasses

Limitation subclasses	Diagnostic attributes
m2	>130 mm Plant available water capacity (PAWC)
m3	100–130 mm PAWC
m4	75–100 mm PAWC
m6	<75 mm PAWC
pd3	0.5–1 m effective soil depth
pd4	0.25–0.5 m effective soil depth
pd6	<0.25 m effective soil depth
ps2	Surface conditions which provide minor limitation to germination, seedling emergence and crop establishment
ps3	Moderate limitation
ps4	Severe limitation
nd2	Moderate nutrient status in the virgin state, especially phosphorus
nd3	Low nutrient status, especially phosphorous
pm2	Clay soils with a narrow appropriate soil moisture range for successful cultivation, i.e. light clay surfaces
pm3	Clay soils with a minimal soil moisture range for successful cultivation, i.e. medium to heavy clay surfaces
sa2	Moderate to high salinity levels (>0.45 dS/m) between 0.6–0.9 m or below
sa3	Moderate to high salinity level <0.6 m
sa4	Discharge areas which may become salinised
sa6	Areas affected by secondary salinisation
ts4	Short steep slopes or gullies that prevent machinery use
ts6	Slopes 15–20%
ts7	Slopes 20–45%
ts8	Slopes >45%
r2	Few surface gravel or rock outcrop
r3	Common surface rocks or rock outcrop (10–20%)
r4	Moderate or many surface rocks or rock outcrop (20–50%)
r5	Abundant surface rock or rock outcrop (>50%)
tm2	Vertical interval of gilgai between 0.1 and 0.3 m
tm3	Vertical interval >0.3 m
w4	Low lying areas seasonally wet
w5	Seep areas usually permanently wet
e2	Suitable for cultivation with simple erosion control practices, i.e. slopes <2% for Sodosols, 2–5% other soils
e3	Suitable for cultivation with intensive erosion control methods, i.e. slopes 2–5% for Sodosols, 5–10% other soils
e4	Marginal soils for cultivation even with intensive control methods, i.e. slopes 10–12% on soils other than Sodosols
e6	Continuous pasture required to reduce erosion losses but cultivation acceptable to establish pasture, i.e. Slopes 5–10% for Sodosols, 12–20% for other soils
e7	Continuous pasture required to reduce erosion losses with high management input, i.e. Slopes 10–20% for Sodosols 20–45% for other soils
e8	Grazing not recommended, i.e. slopes >20% for Sodosols and >45% for other soils
f2	Flooding occurs but only minimal to moderate damage to crops
f3	Flooding may cause severe damage to crops
x6	Areas normally suitable for cultivation but due to inaccessibility, small areas or other restrictions cause the area to be downgraded

Self mulching surfaces, especially those with a fine self mulch, present fewer problems with germination and emergence than those that set hard. Most of the cracking clays in the area have self mulching surfaces with those of the *Three Moon* land systems and the land systems in group 2 (basic and intermediate, intrusive and extrusive igneous rocks) having the finer properties.

The surfaces of most other soils have hardsetting properties and would present problems with germination and establishment especially those with loam to clay loam surfaces. Secondary spread of introduced grass species can be restricted by the hardsetting surface of soils with sandy loam to clay loam textures (Cavaye *et al.,* 1989).

Narrow moisture range (pm)

Cracking clays have a specific moisture content, usually present for a limited time, during which tillage can successfully be carried out (Ahmad, 1984). The most opportune time to till these soils is approximately at the lower plastic limit (Utomo and Dexter, 1981). If wetter the soil will smear and if drier clods will be produced.

Timing of cultivation is an important consideration in cropping areas especially for planting operations for summer crops. The high evaporation rates narrow the time period considerably for the most opportune time for broad acre planting. Subjective assessment of this limitation has been made based largely on the clay content of the surface of these cracking clays with the heavier clays (medium to heavy clays) being assessed as having a narrower opportune time for cultivation than those with lighter clay surfaces.

Salinity (sa)

The presence of soluble salts in the soil solution can affect crop growth by reducing the water available to the crop (osmotic effect) and by increasing the concentration of certain ions that have a toxic effect on plant metabolism (specific effect) (FAO 1985). Salinity may be an inherent attribute of the soil and may also occur as the consequence of agricultural practices or clearing of native vegetation (Shields and Williams, 1991).

Soils with moderate to high salinity levels (EC >0.45 dS/m) below 0.6 m are expected to provide a minor limitation to production while those soils with high levels above 0.6 m are expected to cause moderate limitation to productivity.

Many of the soils, especially Sodosols on the alluvial land systems and on the lower slopes of land systems from group 7, have negligible to moderate (EC >0.45 dS/m) salinity limitations. Vertosols on *Monto, Trapyard, Cynthia, Evergreen 2, 6* and *8* of group 7 and *Ceratodus, Grosvenor* and *Hollywell* of group 1 have similar salinity limitations.

Discharge areas within the *Monto* land system below the Mulgildie plateau, the valley flats of *Caswell 4* and some of the lower slopes of *Wonbah* may become salinised or are presently affected and have been assessed as having a sa4 to sa6 limitation.

Topography limitation (ts)

Topography affects the use of machinery for cultivation and harvesting and very steep slopes may affect the accessibility of this land to grazing animals. Areas with short steep slopes or with gullies that prevent safe machinery use are assessed as having a topography limitation of ts4 or a severe limitation to cropping.

Slopes between 15 and 20% are regarded as being too steep for continuous cultivation but may be used for occasional cultivation in preparing land for improved pasture. Slopes within this range are given a ts6 limitation subclass. Steeper slopes between 20–45% (ts7) are regarded as too steep for any form of machinery use and lands with these slopes are only suitable for native pasture production. Slopes >45% have a subclass limitation of ts8 as these slopes are regarded as too steep for effective grazing and have access limitations for mustering.

Rockiness limitation (r)

The term rockiness refers to rock outcrop and coarse fragments (McDonald *et al.,* 1990). Coarse fragments or outcrop on the surface or in the cultivated zone may interfere with cultural and harvesting operations and may damage machinery. This limitation does not consider the effects of rockiness on properties such as soil water storage capacity or infiltration and erodibility. The limitation is based on the percentage of coarse fragments of various sizes on the surface or in the plough layer.

Few surface gravel or rock outcrop was regarded as offering a slight restriction to farming operations and given a subclass of r2. Areas with abundant rock or outcrop >50% prevent machinery use and have a subclass of r5. Subclass r4 is allocated to those lands with 20–50% rock outcrop or surface stone which would provide a severe restriction to the use of machinery. Land with 10 to 20% surface rock or surface stone would present a moderate impediment to the use of machinery.

Microrelief (tm)

Microrelief refers to relief up to a few metres above the plane of the land surface (McDonald *et al.,* 1990). The limitation considers the effect of microrelief on the cultivation and trafficability of machinery.

Normal or linear gilgai with vertical interval of 0.3 m or less is common on the Vertosols of many of the land systems. This microrelief is considered to cause only a slight restriction to the use of machinery.

Land with normal gilgai of vertical interval greater than 0.3 m is regarded as having a greater impediment to the use of machinery and successful operation and establishment of crops and is allocated a tm3 subclass.

Wetness (w)

The wetness limitation considers the affects of excess water on crop production and on effective machinery operation. In this study, wetness refers to areas which have excess water on the soil surface or within the profile as a result of rainfall or run-on from surface water or from seeps. This excess water remains on the surface or in close proximity due to poor soil permeability or restricted surface drainage.

Two subclasses have been defined in this area. Only limited areas which are usually permanently to seasonally wet from seepages are present in the area. Seep areas that are permanently wet prevent cultivation being carried out and severely limit crop production from these areas. These areas have been given a w5 subclass. Other areas which are wet seasonally have been given a subclass of w4 due to fewer restrictions on the use of that land. However most land units with a wetness limitation have seasonally or permanently wet areas and therefore have been allocated w4 and w5 subclasses.

Land systems with the wetness limitation include *Hogback, Caswell 4, Perry 1, Evergreen 1* and *Aranbanga 2.*

Water erosion (e)

Erosion causes soil deterioration and reduces productivity by removing plant nutrients and organic matter. As erosion increases, cultivation becomes more difficult, depth of soil decreases and if erosion continues unabated, productivity may be reduced to zero.

Climatic factors (amount, distribution and intensity of rainfall), landform (gradient and shape of slope), edaphic factors (infiltration rate and soil erosivity), vegetative cover and management practices are major factors influencing water erosion. Slopes, soils and management practices for the climatic conditions of the area were the criteria used for subclass determination. Sodic duplex soils (Sodosols) are more erosive then other soils so effective erosion control cannot be achieved on similar slopes as those on other soils.

Increased management inputs are required as slope increases with marginal arable land (class IV) assessed as having slopes of 10–12% on all soils except Sodosols with intensive erosion control methods. Land with a subclass e6 will need to have continuous pasture as the major enterprise to reduce erosion losses although cultivation is acceptable for pasture establishment with 5–10% slopes for Sodosols and with slopes of 12–20% for other soils.

Grazing is not recommended on slopes >20% for Sodosols and >45% for other soils and land with those attributes has a subclass of e8.

Flooding (f)

Crop damage due to flooding is a result of both moving water or submersion by standing water. Submersion can cause damage by depriving the plant of oxygen while flowing water can flatten the crop, expose roots, cover the crop with silt or cause stream bank erosion and damage infrastructure.

The flooding limitation is only applicable to land adjacent to rivers and major creeks. Subjective assessment based on an estimate of damage to crops has been used as the criteria for subclass determination.

Land complexity (x)

This limitation refers to areas that may be suitable for a particular enterprise but due to inaccessibility may not be able to be used for that purpose. In this study area only one limitation subclass is used (x6) to downgrade areas normally suitable for cultivation but become unsuitable due to a range of restrictions.

Land classes

A range of land capability classes may be assigned for each mapping unit depending on the land classes evaluated for the land units. The dominant land class and subdominant land class (where applicable) for the mapping units are recorded on the computer database and are also represented on the land capability map which accompanies this report. Other land classes may be present but the dominant and subdominant land class range usually represents greater than 70% of the mapping unit.

Areas of the dominant and subdominant land class combinations and the number of mapping units are shown in Table 21.

Table 21. Areas of the dominant and subdominant land capability classes with the number of mapping units for the North Burnett area

Dominant land class	Subdominant land class	Number of mapping units	Area (ha)
II	III	4	14 476
III	III	2	11 116
III	IV	48	94 551
III	VI	11	26 992
III	VII	2	2 700
IV	III	10	39 805
IV	VI	42	33 404
VI	III	10	10 156
VI	IV	52	79 355
VI	VI	90	352 991
VI	VII	55	210 701
VI	VIII	1	4 266
VII	VI	59	139 408
VII	VII	104	36 362
VII	VIII	24	65 346
VIII	VI	13	14 996
VIII	VII	5	6 581
VIII	VIII	2	1 803

No land systems have class I land. The *Three Moon* land system, one of the alluvial land systems, has some areas of class II and class III. Only mapping units 488 (*Hurdle*) and 330 (*Aranbanga 1*) are class VIII.

The dominant and subdominant land classes of the mapping units are shown in Appendix IV.

Land Uses

Agricultural, pastoral, horticultural and forestry industries are important enterprises in the area. The production from the major crops and the number of livestock for the shires of Monto and Eidsvold is shown in Table 22. Beef cattle production is the major industry in the Perry Shire. The Bania State Forest lies within the Perry Shire and is a major source of native timber products in the shire.

Table 22. Production from the major enterprises for the Eidsvold and Monto Shires between 1989 and 1997

EIDSVOLD								
Enterprise	**1989-90**	**1990-91**	**1991-92**	**1992-93**	**1993-94**	**1994-95**	**1995-96**	**1996-97**
Lucerne Hay (T)	1 544	1 969	2 005	1 699	2 090	1 865	1 655	1 489
Hay other than lucerne (T)	1 566	1 989	2 257	130	2 277	2 050	1 910	295
Wheat for grain (T)	759	312	52	174	188	18	215	426
Barley for grain (T)	99	70	67	97	86	108	133	449
Sorghum for grain (T)	241	428	611	246	1459	482	664	1 051
Citrus fruit (T)	504	406	2 408	2 975	3 109	3 583	2 635	3 000
Dairy cattle (No.)	325	204	79	100	138	175	150	110
Beef Cattle (No.)	57 703	58 393	57 163	61 110	64 004	60 699	63 455	65 799
Pigs (No.)	1 420	1 628	1 618	1 584	1 641	1 591	1 149	868
MONTO								
Lucerne Hay (T)	10 725	10 873	13 788	12 835	15 953	11 674	8 520	10 955
Hay other than lucerne (T)	677	1 044	1 175	617	17	573	1 147	799
Wheat for grain (T)	7 538	6 304	1 643	5 146	3 650	1 022	800	4 903
Barley for grain (T)	1 499	1 057	182	612	942	265	193	544
Sorghum for grain (T)	4 057	5 911	7 588	4 785	8 665	4 560	6 535	5 546
Citrus fruit (T)	--	--	--	--	--	--	--	--
Dairy cattle (No.)	6 315	5 925	5 798	5 990	6 350	6 590	6 405	6 194
Beef Cattle (No.)	87 668	88 205	88 117	90 687	93 511	86 457	78 896	83 200
Pigs (No.)	18 362	16 778	15 332	16 643	16 395	17 556	15 609	16 199

T = tonnes No. = Number (Source: Bureau of Statistics, Agricultural)

Agriculture

Crop production is important in the Monto Shire with some cropping for grain or fodder in the Eidsvold Shire. Major crops include lucerne grown for hay with sorghum and barley grown for grain. Other crops grown in the area for grain include oats, maize, millet, panicum and soybeans. Pastures (excluding lucerne) as well as forage sorghum are also cut for hay.

The major cropping enterprises are carried out on land systems *Three Moon* and *Monto*.

Lucerne is an important crop in the Monto Shire where more than 10 000 tonnes of hay is produced annually. This crop is produced under irrigation in the *Three Moon* land system. Other crops such as wheat, barley and sorghum grown in the *Three Moon* land system are often supplemented by irrigation.

The fluctuations in grain production for the different time periods as shown in Table 21 are usually the result of rainfall variability.

Pastoral enterprises

Beef cattle production is the major enterprise of the three shires of the study area while milk production from dairy cattle is important in the Monto Shire.

Beef cattle

More than 180 000 beef cattle are presently run in the area with Monto Shire grazing over 80 000 head, Eidsvold about 65 000 head and Perry Shire about 35 000 head. Beef production is based primarily on native pastures throughout the whole area. However, improved pastures such as rhodes grass (*Chloris gayana*), green panic (*Panicum maximum*) and buffel grass (*Cenchrus ciliaris*) have increased carrying capacities on the "softwood scrub" and brigalow country. Land systems on which improved pastures have been introduced include *Monto, Kapaldo, Caswell 1, Muncon 1, Nogo 1, Brumby, Hindmarsh 1* and *Evergreen 2, 3* and *5*.

Grazing crops, such as oats and forage sorghums are also grown in some areas to supplement native or improved pastures and to finish off cattle for market.

Dairy cattle

Milk production is important in Monto Shire where 39 suppliers produced 20.2 m litres of milk in 1996–97. Dairy cattle numbers have fluctuated between about 5800 and 6500 over the period between 1989–90 and 1996–97 (Table 22).

The dairy industry is generally concentrated on the alluvial land system of *Three Moon* where irrigated perennial and annual pastures are the major food source for the dairy cattle.

The milk is either transported to Gladstone or to the Monto factory for production of butter or casein.

Pigs

Several intensive large piggeries are located in the area particularly in the Monto Shire. The number of pigs in the Monto Shire has varied between 15 500 and 18 000 over the nine year period between 1989 and 1998. The number of pigs in the Eidsvold Shire has been decreasing from about 1500 in the early 90s to less than 1000 in 1996–97 period.

Horticulture

Citrus production including oranges, mandarins and limes is important in Eidsvold Shire. Some grapes are also grown in the area.

Total production is now about 3000 tonnes increasing substantially from 406 tonnes in 1990–91 to 2500 tonnes in 1991–92. A large increase in tree plantings occurred in the late 1980's. About 29 000 trees were producing fruit in 1992, almost double the number from the previous year.

Forestry

Twenty three State Forests (SF) are located in the area varying in size from 1.42 ha to the largest of 41 043 ha. Coominglah SF in Monto Shire is the largest while Bania SF in Perry Shire occupies 32 718 ha. There also two timber reserves in the area, both in Perry Shire.

A beech scientific area of 350 ha is located in Monto Shire while another scientific area of 120 ha is preserved in Perry Shire. Kalpowar SF, part of which is in the Monto Shire, has an area of 2735 ha planted to hoop pine.

Native timber logged from the State Forests in the area is processed at five mills located near Eidsvold and Monto. Timber logged from Bania State Forest in Perry Shire supplies other mills outside the area.

Land Degradation

Land degradation has occurred to various degrees in the area. The major forms of degradation are soil erosion, tree and scrub regrowth, salinity, pasture degradation and weed infestations.

Erosion

Degradation by erosion has occurred on sloping lands on both the intensively cropped lands and grazing land. The relatively high adoption of mechanical methods of erosion control such as contour banks has decreased erosion losses on much of the sloping cropped lands. However, maintenance of these structures has been neglected in many areas with subsequent higher risks of erosion losses. A series of low rainfall years has also resulted in poor crop growth which provides little protection to erosion when storm rains commence.

In grazing land, gully erosion is a serious problem in many of the mapping units especially those with a large proportion of their area occupied by Sodosols. Inappropriate land uses on these soils up to 50 years previously has been the major factor in their deterioration. Overgrazing with resultant poor ground cover has also influenced this degradation.

Gully erosion is severe in some areas of mapping units 375 and 475 of land system *Hutton 2* as well as other mapping units of the same land system. Land systems of *Caswell 2* including mapping units 213, 414, 432, 440 and 443 have areas with severe gully erosion. Patches of severe erosion have also occurred in mapping units of *Caswell 3* and *4*.

Complete clearing of land systems with moderately inclined slopes (10–32%) has resulted in severe gully erosion along drainage lines. These include many of the land systems on acid intrusive rocks in the eastern part of the study area such as *Wonbah, Wolca, Perry 1, Nour* and *Briggs 1* land systems. Often similar land systems on steeper slopes with less clearing have fewer gullies. However, deep gullies are also present in parts of other areas such as mapping unit 399 of *Coominglah* land system where little disturbance has occurred. Severe gully erosion has occurred on mapping unit 472 on land system *Scalper*.

Salinity

Smith (1987) reported that only small salinity outbreaks have occurred in the area. Due to a period of dry years during the 1990's no increase of salinity outbreaks has been observed. Searle and Baillie (in press) indicate that fringe areas at the contact between highly weathered basalt flows or other lateritic areas and less permeable underlying material are areas likely to become salinised. A number of these landforms exist throughout the area. The most serious outbreaks of salinity in this situation are below the Mulgildie Plateau at the contact between the deeply weathered material of the plateau and the impermeable clay derived from the Mulgildie Coal Measures. Saline water seepages at this contact have developed a number of scalded areas. Water in a dam near one of these seepage areas had extremely high salinity levels with an electrical conductivity reading of 24 dS/m in 1994. Land unit 8 of the *Monto* land system may have small areas affected by these outbreaks.

A similar landscape situation occurs below the Yarrol plateau and salt affected areas may develop below this plateau.

Other small isolated patches affected by salinity have been identified in low-lying areas mainly in the *Hutton* and *Caswell* land systems. Smith (1987) has identified small patches of salinity near Bancroft, Eidsvold and Mt Perry.

Alluvial aquifers, which are used for agricultural and town water supply purposes in the Three Moon Creek land system, between Monto and Mulgildie have deteriorated since the 1970s. Increased rates of groundwater extraction since the 1970s have resulted in reduction in water levels and in some places increasing salinity levels. Electrical conductivity measurements of greater than 4 dS/m of aquifer water are common in this area with some bores as high as 20 dS/m (Water Resources Internal Report).

Tree and scrub regrowth

Eucalypt, wattle and scrub regrowth have occurred throughout the area following clearing of the natural vegetation where regrowth control measures have not been implemented. Regrowth of eucalypt species is often aided by heavy stocking rates which eliminates competition between the grass species and the seedling trees and scrubs.

Fire, especially a slow one with adequate fuel, will keep eucalypt seedlings up to 1 m tall under control by destroying the top growth and is the cheapest form of control (Daniel *et al.,* in press). Usually a good fire after pulling a stand of mature trees will reduce the incidence of woody plant regrowth.

Good pasture maintenance and spraying to control regrowth of brigalow suckers is also an important issue on land systems originally supporting brigalow.

Wattle regrowth is common on many of the shallower, often stony, soils on hillcrests and ridge lines and steeper sloping areas. Often these areas should not have been cleared originally so often the protection now offered to erosion by this regrowth is more beneficial than that of the poor native pasture production from these soils.

Pasture degradation

Pasture degradation has occurred throughout the area and is related to a number of factors such as excessive grazing pressure, indiscriminate use of fire and poor seasons. Decreased soil fertility is also seen as a major factor in pasture degradation especially nitrogen decline. Sown pastures have declined at Brian Pastures Research Station, Gayndah at such a rate that after 10 years, production is likely to be little or no better than native pastures (Anon, 1986). The incorporation of legumes into pasture and the use of fire is expected to reduce the rate of run down of pastures.

Wiregrass has decreased productivity of black speargrass pastures in some areas especially on mapping units 256 and 365. Inappropriate land uses as well as overstocking and poor pasture management are the most likely factors causing this degradation. Daniel *et al.,* (in press) recommends that burning needs to be repeated annually and stocking rate needs to be reduced considerably to reduce the wiregrass population. Reduced stocking rate is necessary to allow the speargrass to seed as well as increasing the fuel load to support a good fire.

Infestation of creeping lantana has occurred in the area and S. Flannery *(pers. comm.)* in her study on the extent of creeping lantana within Queensland identified Monto and Perry Shires with a major creeping lantana problem while the Eidsvold Shire has a minor problem. The spread of creeping lantana increases under dry conditions followed by rain. Creeping lantana under dry conditions colonises bare areas and quickly spreads after rain as it recovers faster than most grasses. This plant is unpalatable and if allowed to proliferate will reduce productivity significantly in affected areas.

Research into the ecology of this plant is being undertaken to better understand its growth habit in an attempt to control the spread of this weed.

Bush lantana is also a problem in some areas especially on “softwood scrub” soils and needs to be eradicated. Small-leaved cottonbush has also invaded degraded pastures in some areas especially on land systems dominated by Sodosols such as *Hutton* and *Caswell* land systems.

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APPENDIX I
Land Unit Descriptions

Introduction

Seven hundred and three land units are described in terms of landform attributes, soils, remnant vegetation and land capability for the 104 land systems.

The geological formations are those of Ellis (1968), Dear *et al.,* 1971 and Whitaker *et al.* (1974). The scientific names for the vegetation species are shown in Appendix II.

Many terms used in the descriptions are from Northcote (1979), McDonald *et al.* (1990), and Isbell (1996). The primary profile form division and subdivisions, i.e. cracking clays, non cracking clays, gradational soils and duplex soils are those of Northcote (1979). The final classification, i.e. Red Chromosols, Black Vertosols, etc. is the Australian Soil Classification of Isbell (1996). The soil colours are those of the colour classes of the same author.

Some of the important criteria used in the descriptions are shown below:

Soil depth:

Very shallow:	<0.25 m
Shallow:	0.25 - <0.5 m
Moderately deep:	0.5 - <1.0 m
Deep:	1.0 - <1.5 m

A1 horizon thickness:

Thin:	<0.1 m
Medium:	0.1 - <0.3 m
Thick:	0.3 – 0.6 m
Very thick:	>0.6 m

Soil reaction trend

Acid trend:	surface soil has pH value lower than 7.0 and the deep subsoil has a pH value <6.5.
Neutral trend:	surface pH has pH value between 5.0 and 8.0 and deep subsoil has pH value between 6.5 and 8.0
Alkaline trend:	surface soil has pH value >5.0 and the deep subsoil has pH value >8.0

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Land System Page Reference

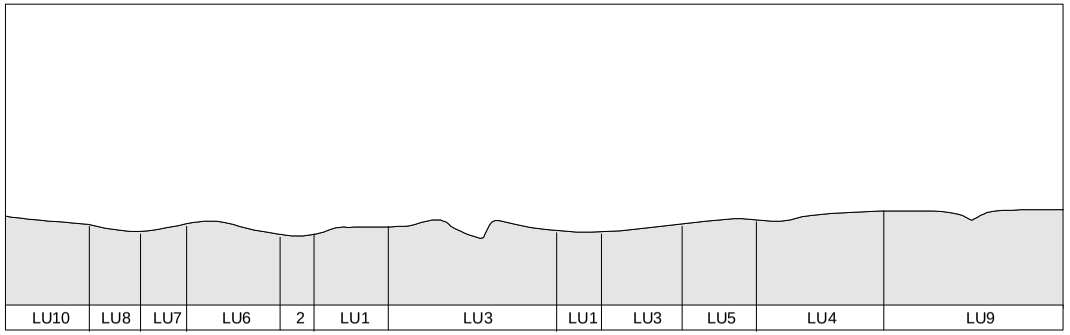
LAND SYSTEM - THREE MOON (Tm)

General Description: Level to gently undulating plains of recent alluvia. Major soils are deep, black and grey, cracking clays, black, brown and grey, non cracking clays and gradational soils over sandy D horizons (Vertosols and Dermosols).

Geology: Quaternary alluvia.

Landform: Level to gently undulating plains with associated levees, channels, drainage depressions, fans and prior streams.

Vegetation: Eucalypt woodland to open woodland, completely cleared and under irrigated cropping or with native or improved pastures. Queensland blue gum, Moreton Bay ash, poplar box and bloodwoods with minor areas of belah and brigalow.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	40	Floodplain, 0-1% slope.	Deep, black, cracking clays with self mulching surfaces; medium clay A horizons; medium to heavy clay B horizons, (occasionally D horizons of clay loam to light clay present below 0.9 m); alkaline soil reaction trend. Black Vertosols.	Eucalypt open woodland. Queensland blue gum, poplar box and Moreton Bay ash.	II m2, pm2, f2
LU2	5	Drainage depressions, 0-1% slope.	Deep, grey, cracking clays with coarse self mulching surfaces; medium to heavy clay A horizons; medium to heavy clay B horizons; alkaline soil reaction trend. Grey Vertosols.	Eucalypt open woodland. Queensland blue gum, poplar box and belah.	III m2, pm3, f2
LU3	20	Levees, floodplain, 0.5-2% slope.	Deep, black and brown, non cracking clays (occasionally cracking), uniform, medium textured soils and gradational soils with weakly self mulching to hardsetting surfaces; clay loam to light clay, medium A horizons; clay loam to light medium clay B horizons; (sandy clay loam to sandy light clay D horizons below 0.8 m sometimes present); alkaline soil reaction trend. Black and Brown Dermosols.	Eucalypt woodland. Queensland blue gum, Moreton Bay ash and bloodwoods.	II-III m2-3, ps2-3, f2
LU4	5	Fans, 0.5-2% slope.	Moderately deep, black, grey and brown, non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons; light to light medium clay B horizons; fine sandy loam to medium clay D horizons; alkaline soil reaction trend. Black, Grey and Brown Dermosols.	Eucalypt open woodland. Queensland Blue gum, poplar box and Moreton Bay ash.	III m3, ps2, f2

THREE MOON (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU5	5	Fans, 0.5-2% slope.	Shallow, black and grey, non cracking clays with hardsetting surfaces; light clay A horizons over sand to sandy loam D1 horizons, over fine sandy loam to medium clay D2 horizons or buried soils; neutral to alkaline soil reaction trend. Chernic-Leptic Tenosols.	Eucalypt open woodland. Poplar box and Moreton Bay ash.	IV m4, ps2, f2
LU6	5	Fans and prior streams, 1-2% slope.	Shallow to moderately deep, brown, uniform, coarse and medium textured soils with hardsetting surfaces; sandy loam to loam, medium to thick A horizons; sandy loam to clay loam B horizons; sandy light clay D horizons; neutral soil reaction trend. Brown Dermosols and Kandosols.	Eucalypt open woodland. Poplar box and Moreton Bay ash.	IV m4, ps3, f2
LU7	5	Fans, 0.5-1% slope.	Deep, mottled, grey and brown, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium to thick A horizons often with bleached A2 horizons; light to medium clay B horizons; neutral to alkaline soil reaction trend. Grey and Brown Dermosols.	Eucalypt open woodland. Poplar box and Moreton Bay ash.	III m3, ps3, f2
LU8	<5	Fans, 0.5-1% slope.	Deep, red, non cracking and cracking clays with hardsetting surfaces; light clay, medium A horizons; medium clay B horizons; neutral soil reaction trend. Red Dermosols and Vertosols.	Eucalypt woodland. Poplar box and Queensland blue gum.	II-III m2-3, pm2, f2
LU9	10	Major drainage lines, 1-3% slope.	Deep, black and grey, cracking clays with self mulching surfaces; light to medium clay A horizons; medium to heavy clay B horizons; alkaline soil reaction trend. Black and Grey Vertosols.	Belah forest. Belah, poplar box and brigalow.	II-III m2, pm2-3, sa2, f2
LU10	<5	Fans, 0.5-1%.	Deep, mottled, brown and grey, sodic duplex soils with hardsetting surfaces; sandy loam to clay loam, medium to thick A horizons, with bleached A2 horizons; medium clay B horizons; neutral soil reaction trend. Brown and Grey Sodosols.	Eucalypt woodland. Poplar box.	IV and VI m4 and 6, pd3, ps3, sa2, f2

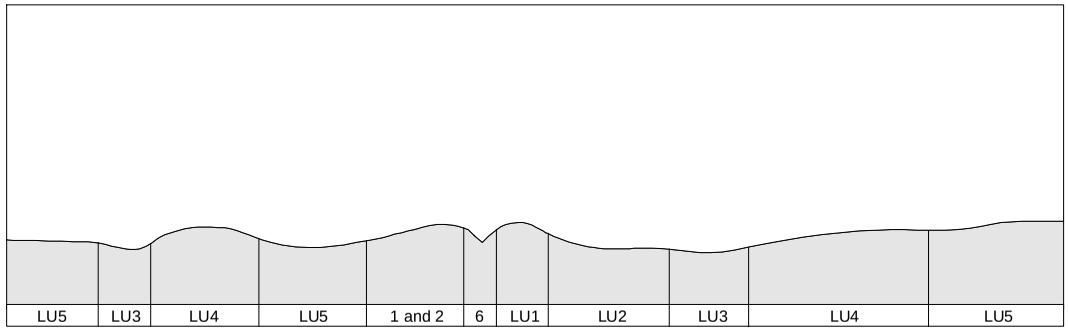
LAND SYSTEM - CERATODUS (Cd)

General Description: Level to gently undulating plains of recent alluvia associated with the Burnett River and major creeks. Major soils are deep, grey and brown, sodic duplex soils, black and brown, non cracking clays, gradational soils, uniform, coarse and medium textured soils, and grey and black, cracking clays (Sodosols, Dermosols, Tenosols, Rudosols and Vertosols).

Geology: Quaternary Alluvium.

Landform: Level plain to gently undulating plain with associated levees, channels, fans, backplains and drainage depressions.

Vegetation: Eucalypt woodland to open forest, completely cleared and under either irrigated cropland or dryland native or improved pasture. Queensland blue gum, rough barked apple, poplar box, gum topped box, silver-leaved ironbark and Moreton Bay ash.



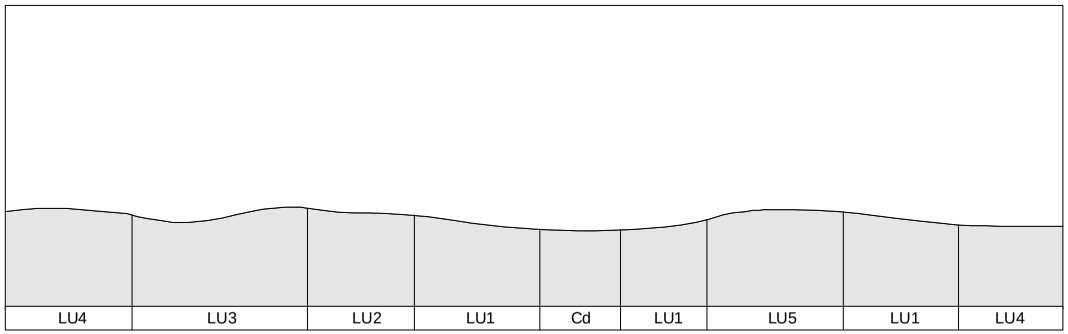
Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	25	Levees, 0-1.5% slope.	Shallow to deep, brown, uniform, coarse and medium textured, alluvial soils with loose to hardsetting surfaces; loamy sand to sandy loam to loam, medium to thick A horizons; sandy loam to clay loam B or D horizons; neutral soil reaction trend. Leptic Tenosols and Stratic Rudosols.	Eucalypt woodland to open forest. Queensland blue gum, rough barked apple, silver-leaved ironbark and Moreton Bay ash.	IV and VI m4 or 6, ps3, f2
LU2	25	Backplains and levees, 0-1.5% slope.	Deep, black and brown, non cracking clays and gradational soils with hardsetting to firm surfaces; sandy clay loam to light clay, medium to thick A horizons; clay loam to medium clay B or D horizons; neutral to alkaline soil reaction trend. Black and Brown Dermosols.	Eucalypt woodland to open forest. Queensland blue gum, rough barked apple, silver-leaved ironbark and Morton Bay ash.	III-IV m3-4, ps3, f2
LU3	10	Backplains and drainage depressions, 0-1% slope.	Deep, black and grey, cracking clays with self mulching surfaces; light to medium heavy clay A horizons; medium to medium heavy clay B horizons; alkaline soil reaction trend. Black and Grey Vertosols.	Eucalypt woodland. Queensland blue gum, poplar box, gum topped box and narrow-leaved ironbark.	II-III m2, pm2-3, f2

CERATODUS (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU4	10	Fans and levees, 0-1.5%.	Deep, often mottled, brown, sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, thick to very thick A horizons, with bleached A2 horizons; medium to medium heavy clay B horizons; acid to neutral soil reaction trend. Brown Sodosols.	Eucalypt woodland. Silver-leaved ironbark and narrow-leaved ironbark.	IV or VI m4 or 6, pd2-3, sa2, e2, f2
LU5	25	Back plains and drainage depressions, 0-1%.	Deep, brown, black and grey, sodic duplex soils and gradational soils with hardsetting surfaces; sandy clay loam to clay loam; medium to thick A horizons, usually with bleached A2 horizons; light clay to medium heavy clay B horizons; alkaline soil reaction trend. Brown, Black and Grey Sodosols and Dermosols.	Eucalypt woodland. Poplar box, gum topped box, silver-leaved ironbark, Moreton Bay ash and Queensland blue gum.	III -IV m3 -4, pd3-4, ps3, sa2, e2, f2
LU6	5	Steam channels, benches and banks.	Unconsolidated sands and gravels.	Eucalypt woodland. Queensland blue gum, Moreton Bay ash, Melaleuca species and River she oak.	VII

LAND SYSTEM - GROSVENOR (Gv)

General Description: Level to gently undulating plains of old alluvia. Major soils are brown and grey, cracking clays and sodic duplex soils (Vertosols and Sodosols).
Geology: Quaternary Alluvium (Qa).
Landform: Level plain to gently undulating plain associated with old alluvia of the Burnett River and associated streams.
Vegetation: Eucalypt open forest to woodland, extensively to completely cleared. Poplar box, gum topped box, silver-leaved ironbark, Queensland blue gum and Moreton Bay ash with patches of brigalow, belah and wilga.



Note: Ceratodus is also included within this land system

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	30	Level to gently undulating plains adjacent to recent alluvia, 0-3% slope.	Deep, brown and grey, sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium A horizons, usually with bleached A2 horizons; medium to heavy clay B horizons; D horizons of sandy clay loam to heavy clay may be present; alkaline soil reaction trend. Brown and Grey Sodosols.	Eucalypt woodland. Poplar box.	IV m4, pd4, ps3, sa2, e2
LU2	20	Level to gently undulating plains, 0.5-3% slope.	Deep, black and grey, cracking clays with self mulching surfaces; medium to heavy clay A horizons; medium to heavy clay B horizons; alkaline soil reaction trend. Black and Grey Vertosols.	Eucalypt woodland. Poplar box, gum topped box, silver-leaved ironbark and wilga. Patches of brigalow, belah open forest occur.	II-III m2-3, pm2-3, sa2
LU3	20	Plain, 0-2% slope.	Deep, brown and grey, cracking clays (minor non cracking clays) with hardsetting surfaces; light to medium clay A horizons, occasionally with bleached A2 horizons; medium to heavy clay B horizons; alkaline soil reaction trend. Brown and Grey Vertosols (minor Dermosols).	Eucalypt woodland. Poplar box, gum topped box, silver-leaved ironbark and wilga. Patches of brigalow, belah open forest occur.	III m3, pm2-3, sa2
LU4	20	Plain, 0-2% slope. Gilgai may occur.	Deep, black and grey, cracking clays with self mulching surfaces; medium to heavy clay A horizons; medium to heavy clay B horizons; alkaline soil reaction trend. Black and Grey Vertosols.	Eucalypt woodland. Poplar box and gum topped box.	II-III m2-3, pm3, sa2, tm2
LU5	10	Gentle rises, 2-4%.	Deep, red, sodic duplex soils with hardsetting surfaces; fine sandy loam to clay loam, medium A horizons, occasionally with bleached A2 horizons; medium to heavy clay B horizons; alkaline soil reaction trend. Red Sodosols.	Eucalypt woodland. Poplar box.	VI m4, ps3, sa2, e3

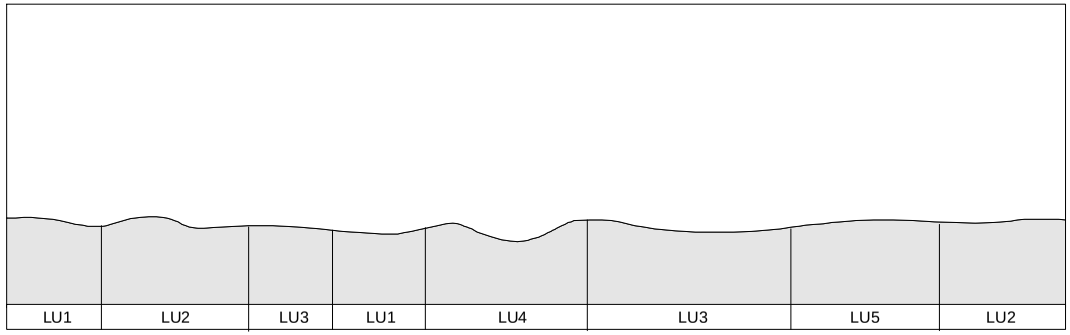
LAND SYSTEM - HOLLYWELL (Hw)

General Description: Level to gently undulating plains of old alluvia. Major soils are deep, black, brown and grey, cracking clays and red, brown and grey, sodic duplex soils (Vertosols and Sodosols).

Geology: Quaternary alluvia.

Landform: Level to gently undulating plains with associated levees and channels of minor drainage lines.

Vegetation: Brigalow open forest, shrubby eucalypt woodland and eucalypt woodland, completely cleared with some cultivation, or limited to extensively cleared. Brigalow, wilga, belah, silver-leaved ironbark, Queensland blue gum, Moreton Bay ash and gum topped box.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	25	Plains, 0-2% slope. Normal gilgai usually present.	Deep, grey and brown, cracking clays with hardsetting to self mulching surfaces; light to medium clay A horizons; medium to heavy clay B horizons; acid or alkaline soil reaction trend. Grey and Brown Vertosols.	Open forest. Brigalow, occasionally with wilga.	III m3, pm2-3, sa2, tm3
LU2	10	Plains, levees and drainage lines, 1-2% slope.	Deep, red and brown, sodic duplex soils with hardsetting surfaces; clay loam, medium to thick A horizons, with bleached A2 horizons; medium to heavy clay B horizons; neutral to alkaline soil reaction trend. Red and Brown Sodosols.	Eucalypt shrubby woodland. Silver-leaved ironbark, Moreton Bay ash, Queensland blue gum, gum topped box and wilga.	IV m4, ps3, sa2, e2
LU3	40	Plains, 0-2% slope.	Deep, black and grey, cracking clays with hardsetting to self mulching surfaces; light to light medium clay A horizons, occasionally with bleached A2 horizons; medium to heavy clay B horizons; alkaline soil reaction trend. Black and Grey Vertosols.	Open forest. Brigalow, belah, Queensland blue gum, grey gum, poplar box and wilga.	III m3, pm2-3, sa2
LU4	15	Plains, levees and drainage lines, 0-2% slope. Normal gilgai usually present.	Deep, brown and grey, cracking clays with self mulching surfaces; light to light medium clay A horizons; medium to heavy clay B horizons; alkaline soil reaction trend. Brown and Grey Vertosols.	Eucalypt shrubby woodland. Silver-leaved ironbark, Moreton Bay ash, wilga, bottle tree and wattles.	III m3, pm2-3, sa2, tm2-3
LU5	10	Plains, 1-2% slope.	Deep, brown and grey, sodic duplex soils with hardsetting surfaces; clay loam, medium A horizons, with bleached A2 horizons; medium clay B horizons; alkaline soil reaction trend. Brown and Grey Sodosols.	Eucalypt woodland. Gum topped box, poplar box and narrow-leaved ironbark.	IV m4, pd4, ps3, sa2, e2

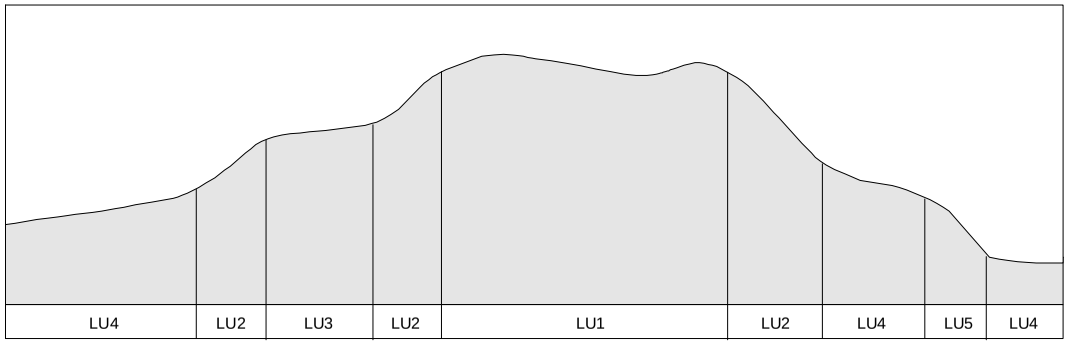
LAND SYSTEM - MULGILDIE (Md)

General Description: Plateau and bounding slopes on deeply weathered, sedimentary rocks. Major soils are deep, red and brown, gradational soils and uniform, non cracking clays (Ferrosols).

Geology: Deeply weathered or lateritised undifferentiated Tertiary Sediments - Shale, sandstone, brown coal, conglomerate.

Landform: Gently undulating rises on the plateau with benches and moderately inclined slopes on the perimeter.

Vegetation: Closed "softwood scrub" forest and eucalypt shrubby forest, usually completely cleared with rainfed cultivation or improved pastures and limited to extensive clearing on the bounding slopes. "Softwood scrub" species, brigalow, narrow-leaved ironbark, spotted gum, bloodwoods and gum topped box.



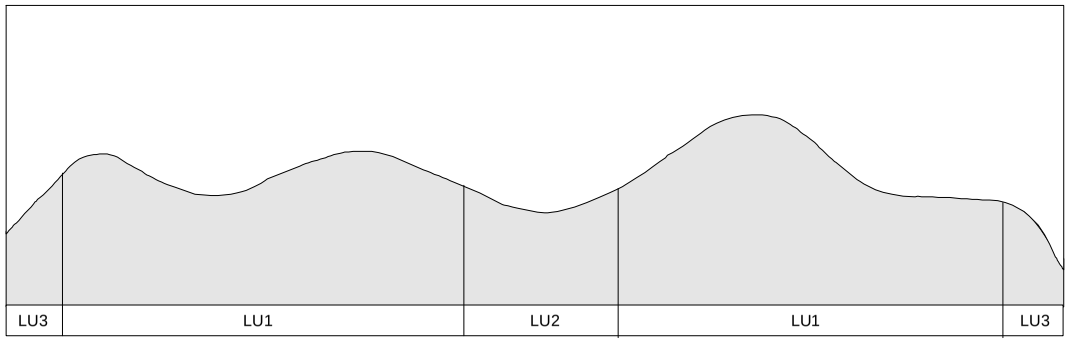
Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	40	Gently undulating plain, 0-3% slope.	Very deep, red, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium to thick, weakly to moderately structured A horizons, usually with light clay to light medium clay, massive to weakly structured, thick B1 horizons; light to medium clay, strongly structured B2 horizons; acid soil reaction trend. Red Ferrosols.	"Softwood scrub" forest.	III m3, ps3, nd3, e2
LU2	30	Slopes, 15-30%.	Very deep, red, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium to thick, weakly to moderately structured A horizons; usually with light clay to light medium clay, massive to weakly structured, thick B1 horizons; light to medium clay, strongly structured B2 horizons; acid soil reaction trend. Red Ferrosols.	"Softwood scrub" forest and eucalypt shrubby forest. "Softwood scrub" species, spotted gum, narrow-leaved ironbark, bloodwoods and gum topped box.	VI-VII m3, ps3, nd3, ts6-7, e6
LU3	10	Benches, 2-6%.	Very deep, red, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium to thick, weakly to moderately structured A horizons; usually with light clay to light medium clay, massive to weakly structured, thick B1 horizons; light to medium clay, strongly structured B2 horizons; acid soil reaction trend. Red Ferrosols.	"Softwood scrub" and eucalypt shrubby forest. "Softwood scrub" species, spotted gum, narrow-leaved ironbark, bloodwoods and gum topped box.	III m3, ps3, nd3, e2-3

MULGILDIE (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU4	15	Lower slopes and benches, 5-12%. Few to abundant pebbles and cobble on surface.	Shallow to moderately deep, red and brown, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium to thick, massive to moderately structured A horizons; usually light clay, massive to weakly structured, thick B1 horizons; light clay strongly structured B2 horizons; often mottled, medium clay buried horizons; acid soil reaction trend. Red and Brown Ferrosols.	Closed forest. Brigalow and "softwood scrub" species.	III-IV m3, ps3, nd3, r3-4, e3-4
LU5	5	Slopes, 10-20%. Outcrop and surface stone common.	Shallow, red and brown, gradational soils with hardsetting surfaces; clay loam, medium, massive to moderately structured A horizons; light clay B horizons; acid soil reaction trend. Red and Brown Ferrosols.	Closed "softwood scrub" forest or eucalypt shrubby woodland. Narrow-leaved ironbark and wattles.	VIII m4, ps3, nd3, ts6, r5, e4 or 6

LAND SYSTEM - GLENLEIGH (Gl)

General Description: Plains, gently undulating rises to undulating low hills on a plateau. Major soils are deep, red and brown, gradational soils and non cracking clays (Ferrosols).
Geology: Deeply weathered Tertiary basalt.
Landform: Gently undulating rises to undulating low hills on a plateau.
Vegetation: Eucalypt woodland, limited to extensive clearing. Lemon scented gum and narrow-leaved ironbark with wattle understorey.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	70	Crests, upper and mid slopes, 1-10%.	Deep, red, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons; light to medium clay B horizons; neutral soil reaction trend. Red Ferrosols.	Eucalypt woodland. Lemon scented gum, narrow-leaved ironbark and wattles.	III m3, ps3, e2-3
LU2	25	Lower slopes, 4-10%.	Deep, brown, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay medium A horizons; light to medium clay B horizons; neutral soil reaction trend. Brown Ferrosols.	Eucalypt woodland. Lemon scented gum, narrow-leaved ironbark and wattles.	III m3, ps3, e2-3
LU3	5	Bounding slopes, 10-20%.	Shallow to deep, red and brown, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons; light to medium clay B horizons, usually with common to many medium pebbles and cobble; neutral soil reaction trend. Red and Brown Ferrosols.	Eucalypt woodland. Lemon scented gum, narrow-leaved ironbark and wattles.	VI m3-4, ps3, ts4 or 6, r2-3, e6

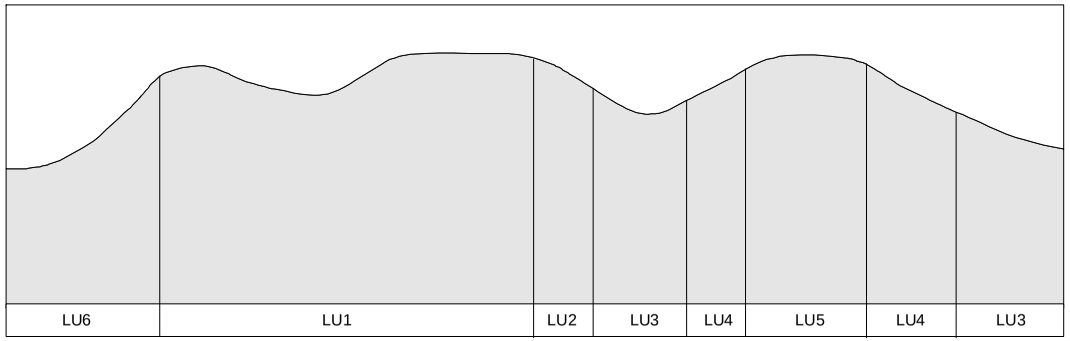
LAND SYSTEM - YARROL (Yr)

General Description: Undulating rises to rolling rises on a plateau with bounding slopes, on deeply weathered, sedimentary rocks. Major soils are deep, red, gradational soils and non cracking clays (Ferrosols, Dermosols, Chromosols and Kurosols).

Geology: Deeply weathered undifferentiated Tertiary sediments - Shale, sandstone, brown coal, conglomerate.

Landform: Undulating rises to rolling rises on the plateau with associated bounding slopes.

Vegetation: "Softwood scrub" forest and eucalypt woodland, usually completely cleared. "Softwood scrub" species, narrow-leaved ironbark, spotted gum, bloodwoods and gum topped box.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	50	Crests and slopes, 2-5%.	Very deep, red, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium to thick, weakly to moderately structured A horizons; usually clay light to light medium clay, massive to weakly structured B1 horizons; light to medium clay, strongly structured B2 horizons; acid soil reaction trend. Red Ferrosols.	Closed scrub. "Softwood scrub" species.	III m3, ps3, nd3, e2-3
LU2	5	Slopes, 10-20%. Rock outcrop and surface stone common.	Shallow, red, gradational soils with hardsetting surfaces; clay loam, medium, massive to moderately structured A horizons; light clay B horizons; acid soil reaction trend. Red Ferrosols.	Closed scrub. "Softwood scrub" species.	V or VII m4, ps3, nd3, (ts6), r5, e4 or 6
LU3	10	Lower slopes, 5-12%.	Deep, brown, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium to thick, weakly structured A horizons; light to light medium clay B horizons, usually with few to many ironstone gravel; acid to neutral soil reaction trend. Brown Dermosols and Ferrosols.	Eucalypt woodland/"softwood scrub" forest. Gum topped box, spotted gum and "softwood scrub" species.	V or VII m3, ps3, nd3, e3-4
LU4	10	Midslopes, 6-12%.	Moderately deep to deep, red, gradational, soils with hardsetting surfaces; loam to clay loam, medium to thick, weakly structured A horizons; light clay B horizons; few to common rock fragments may be present throughout profile; acid soil reaction trend. Red Ferrosols.	Eucalypt woodland. Narrow-leaved ironbark, bloodwoods, gum topped box, bottle trees, wattles and red ash.	IV m4, ps3, nd3, e3

YARROL (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU5	10	Crests and upper slopes, 3-10%.	Shallow to moderately deep, red, non sodic duplex and gradational soils with hardsetting surfaces; loam to clay loam, medium, massive to weakly structured A horizons; light to light medium clay B horizons; rock fragments may be present; acid soil reaction trend. Red Kurosols, Chromosols and Ferrosols.	Eucalypt woodland. Narrow-leaved ironbark, spotted gum, bloodwoods with “softwood scrub” species as understorey.	IV m4, pd1-3, ps3, nd3, e2-3
LU6	15	Bounding slopes, 15-30%. Rock outcrop, pebbles and cobble usually present on surface.	Shallow to deep, red and brown, gradational soils and non cracking clays with hardsetting surfaces; clay loam, medium, weakly structured A horizons; light to light medium clay B horizons; cobble and stone may be present in profile; acid soil reaction trend. Red and Brown Ferrosols and Dermosols.	“Softwood scrub” forest. “Softwood scrub” species or eucalypt woodland. Narrow-leaved ironbark, bloodwoods and spotted gum.	VI-VII m3-4, pd1-3, ps3, nd3, ts6-7, r2-4, e6-7

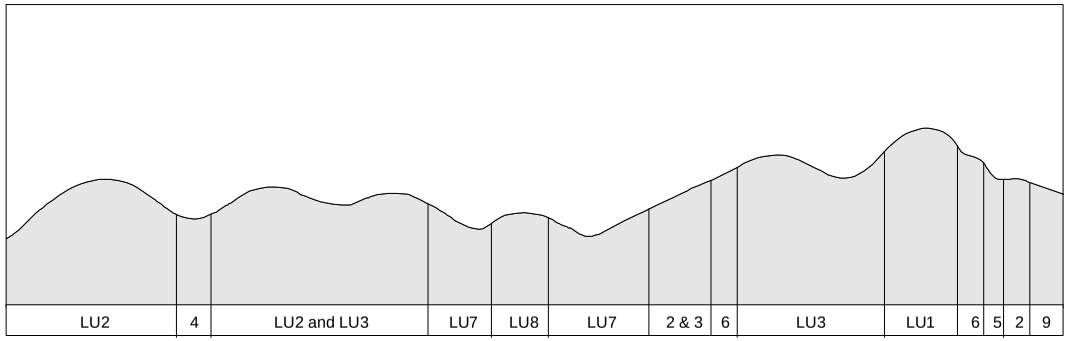
LAND SYSTEM - COOMINGLAH (Cm)

General Description: Undulating low hills to rolling low hills on a plateau on deeply weathered sedimentary rocks. Major soils are deep, red, gradational and uniform, fine textured soils, non sodic duplex soils and grey and brown, sodic duplex soils (Ferrosols, Chromosols and Sodosols).

Geology: Deeply weathered and minor fresh Evergreen Formation.

Landform: Undulating low hills to rolling low hills on a plateau.

Vegetation: Eucalypt open forest to woodland with limited clearing. Narrow-leaved ironbark, spotted gum, grey gum, bloodwoods and gum topped box, occasionally with wattles and *Casuarina* species as understorey.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	5	Higher crests and upper slopes, 5-12%. Lateritised sandstone or fresh sandstone on surface common.	Very shallow to shallow, red, gradational and non sodic duplex soils with loose to hardsetting surfaces; sandy clay to clay loam, thin to medium A horizons; clay loam to light clay B horizons; acid to neutral soil reaction trend. Red Ferrosols and Chromosols.	Eucalypt woodland. Spotted gum, narrow-leaved ironbark and wattles.	VI-VII m6, pd4 or 6, ps3, nd3, r3-5, e3-4
LU2	50	Crests and slopes, 3-8% on undulating rises.	Deep, red, gradational and uniform, medium textured soils with hardsetting surfaces; loam to clay loam to light clay, massive to weakly structured, medium A horizons; usually with loam to light clay, massive to weakly structured, medium to thick B1 horizons; clay loam to light clay, strongly structured B2 horizons; few to common ironstone gravel may be present; acid to neutral soil reaction trend. Red Ferrosols.	Eucalypt open forest to woodland. Narrow-leaved ironbark, bloodwoods, grey gum, spotted gum usually with wattles and *Casuarina* species as understorey.	III m3, ps3, nd3, e2-3
LU3	10	Crests and slopes, 3-8% on undulating rises.	Deep, red, non sodic duplex soils with loose to hardsetting surfaces; fine sandy loam, sandy clay loam, to clay loam, thick, usually massive to weakly structured A horizons, with bleached A2 horizons; light to light medium clay, strongly structured B horizons; ironstone gravel may be present in various horizons; acid to neutral soil reaction trend. Red Chromosols.	Eucalypt open forest to woodland. Bloodwoods, narrow-leaved ironbark, spotted gum and grey gum.	III m3, ps3, nd3, e2-3

COOMINGLAH (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU4	5	Lower slopes and drainage lines, 3-4%.	Deep, brown, sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium A horizons, usually with bleached A2 horizons; medium clay B horizons often with ironstone gravel; acid soil reaction trend. Brown Chromosols and Sodosols.	Eucalypt woodland. Narrow-leaved ironbark and bloodwoods.	IV or VI m4 or 6, pd3, ps3, nd3, e4
LU5	<5	Steep slopes, 20-30%. Surface cobble common in places.	Deep, red, gradational and uniform, medium textured soils with hardsetting surfaces; loam to clay loam to light clay, massive to weakly structured, medium A horizons; usually with loam to light clay, massive to weakly structured, medium to thick B1 horizons; clay loam to light clay, strongly structured B2 horizons; few to common ironstone gravel may be present; acid to neutral soil reaction trend. Red Ferrosols.	Eucalypt shrubby woodland. Narrow-leaved ironbark, bloodwoods, grey gum and spotted gum usually with wattles and *Casuarina* species as understorey.	VI-VII m3, ps3, nd3, r3-4, ts6-7, e6-7
LU6	<5	Midslopes, 5-8%. Rock outcrop common.	Very shallow to shallow, grey, brown and red, gradational soils and uniform, fine textured soils over rock; sandy clay loam to clay loam, medium A horizons; (if present) clay loam to light clay B horizons; ironstone gravel and sandstone gravel common throughout profile; acid soil reaction trend. Leptic Rudosols and Grey, Brown and Red Dermosols.	Eucalypt open woodland. Spotted gum, narrow-leaved ironbark and gum topped box.	VI-VII m6, ps3, nd3, r4-5, e6
LU7	10	Lower slopes, 2-4%.	Deep, mottled, grey and brown, sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium A horizons, with bleached A2 horizons; medium clay B horizons; light to medium clay D horizons may be present; acid soil reaction trend. Grey and Brown Sodosols.	Eucalypt open woodland to woodland. Gum-topped box, narrow-leaved ironbark and spotted gum.	VI m6, ps3, nd3, e2-3
LU8	15	Ridges, crests and midslopes, 3-8%. Rock outcrop may occur.	Moderately deep to deep, (occasionally shallow), mottled, grey and brown, sodic duplex soils with hardsetting surfaces; sandy loam to clay loam, medium A horizons, with bleached A2 horizons; medium clay B horizons; acid soil reaction trend. Grey and Brown Chromosols and Sodosols.	Eucalypt woodland. Narrow-leaved ironbark, spotted gum, grey gum and bloodwoods.	VI m6, ps3, nd3, r2-4, e4
LU9	<5	Slopes off plateau, 8-15%.	Deep, red, uniform, medium textured and gradational soils with soft to hardsetting surfaces; sandy clay loam to clay loam, medium A horizons, clay loam to light clay massive B horizons; acid soil reaction trend. Red Kandosols.	Eucalypt shrubby woodland. Bloodwoods, narrow-leaved ironbark, spotted gum, Moreton Bay ash usually with wattles and red ash.	VI m3, ps3, nd3, e6

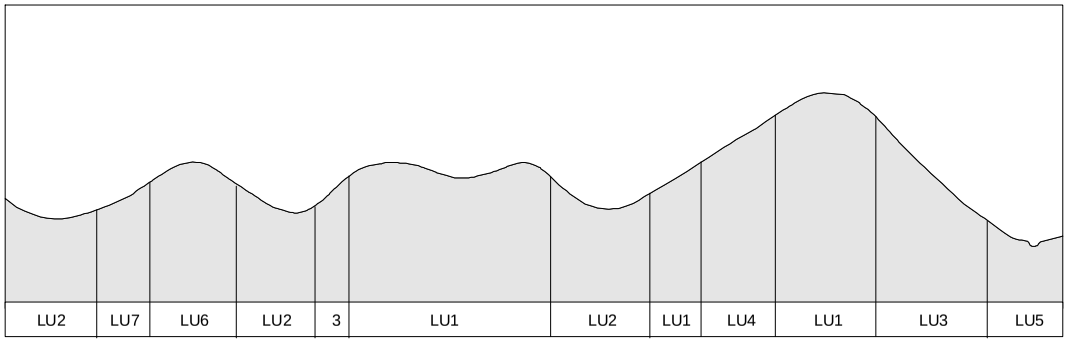
LAND SYSTEM - HUNGRY HILLS (Hh)

General Description: Undulating low hills to rolling hills on a plateau on deeply weathered sedimentary rocks. Major soils are shallow to deep, red and brown, gradational soils, non sodic and sodic duplex soils and non cracking clays (Ferrosols, Chromosols and Dermosols).

Geology: Caswell Creek Group (lateritised or deeply weathered) - Arenite, siltstone, mudstone, conglomerate.

Landform: Undulating low hills to rolling low hills on a plateau.

Vegetation: Eucalypt shrubby open forest with limited clearing. Narrow-leaved ironbark, spotted gum, bloodwoods, gum topped box, wattles, *Melaleuca* species and red ash.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	40	Ridge crests and slopes, 5-12%. Rock outcrop, surface stone and pebbles may be present.	Shallow to deep, red, gradational and non sodic duplex soils with hardsetting surfaces; clay loam, medium to thick, weakly structured A horizons; clay loam to light medium clay, moderately to strongly structured B horizons; acid soil reaction trend. Red Ferrosols and Chromosols.	Eucalypt shrubby open forest. Narrow-leaved ironbark, spotted gum, yellow bloodwood, red ash and wattles.	III-IV m3-4, pd1-3, ps3, nd3, r2-4, e3-4
LU2	15	Midslopes and lower concave slopes, 4-8%.	Deep, brown, sodic duplex and gradational soils with hardsetting surfaces; clay loam, medium A horizons, often with bleached A2 horizons; light to medium clay B horizons; neutral to alkaline soil reaction trend. Brown Chromosols and Dermosols.	Eucalypt open forest. Gum topped box, spotted gum, narrow-leaved ironbark and wattles.	III-IV m3-4, ps3, nd3, e3
LU3	10	Steeper, upper and midslopes, 15-30%, some as steep as 45%. Rock outcrop may be present.	Moderately deep to deep, red, non cracking clays and gradational and non sodic duplex soils with hardsetting surfaces; clay loam to light clay, medium to thick A horizons, sometimes with bleached A2 horizons; light to medium clay B horizons; acid soil reaction trend. Red Ferrosols and Chromosols.	Eucalypt shrubby open forest. Narrow-leaved ironbark, bloodwoods, spotted gum and wattles.	VI-VII m3, ps3, nd3, r2-4, ts6-7, e6-7
LU4	<5	Upper slopes, 15-25%. Rock outcrop, surface stone and cobble, common to abundant.	Very shallow to shallow, uniform, medium textured soils over rock with minor red, non sodic duplex and gradational soils with hardsetting surfaces; sandy clay loam to clay loam, medium A horizons; (when present) light clay B horizons; acid soil reaction trend. Leptic Tenosols and Red Chromosols and Dermosols.	Eucalypt woodland. Narrow-leaved ironbark and spotted gum.	VI-VII m6, pd3-6, ps3, nd3, ts6-7, r4-5, e6

HUNGRY HILLS (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU5	<5	Lower slopes and drainage lines, 2-8%.	Moderately deep to deep, brown, sodic duplex and gradational soils with hardsetting surfaces; clay loam to light clay, medium to thick A horizons, with bleached A2 horizons, often with few to common ironstone gravel; medium clay B horizons; acid to neutral soil reaction trend. Brown Chromosols and Dermosols.	Eucalypt shrubby open forest. Narrow-leaved ironbark, spotted gum, gum topped box, bloodwoods and wattles.	VI m4 or 6, pd3-4, ps3, nd3, e6
LU6	15	Crests and upper slopes, 5-15%.	Moderately deep to deep, red, non sodic duplex soils with hardsetting surfaces; clay loam, medium to thick A horizons, often with bleached A2 horizons; medium clay B horizons; acid soil reaction trend. Red Chromosols.	Eucalypt shrubby open forest. Narrow-leaved ironbark, spotted gum, bloodwoods, wattles and *Casuarina* species.	III-IV m3, ps3, nd3, e3-4
LU7	15	Midslopes, 5-10%.	Deep, red, non cracking clays and sodic duplex soils with hardsetting surfaces; clay loam to light clay, medium to thick A horizons, usually with bleached A2 horizons; light clay to medium clay B horizons; acid soil reaction trend. Red Dermosols and Chromosols.	Eucalypt woodland. Narrow-leaved ironbark, spotted gum, bloodwoods, gum topped box and wattles.	III-IV m3-4, ps3, nd3, e3-4

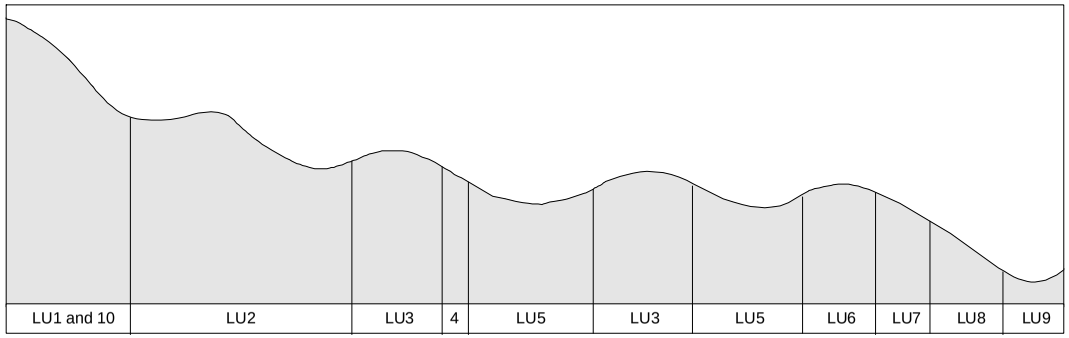
LAND SYSTEM - HURDLE (Hd)

General Description: Cliff-foot slopes and undulating low hills to rolling low hills, primarily on deeply weathered sedimentary rocks. Major soils are shallow to deep, red and brown, gradational soils and uniform, fine textured soils and non sodic duplex soils (Ferrosols, Kandosols, Dermosols, Sodosols and Chromosols).

Geology: Evergreen Formation, minor Muncon Volcanics and unconsolidated sediments.

Landform: Cliff-foot slopes, undulating low hills to rolling low hills.

Vegetation: "Softwood scrub" forest and minor eucalypt woodland with limited clearing to no effective disturbance. "Softwood scrub" species, narrow-leaved ironbark, grey gum and gum topped box.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	<5	Cliff-foot slopes, 40-60%. Rock outcrop and surface stone may be common to abundant.	Shallow, red, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay, shallow to medium A horizons; light to light medium clay B horizons; acid soil reaction trend. Red and Brown Ferrosols.	Closed forest. "Softwood scrub" species.	VIII m6, pd3, ps3, nd3, ts8, r2-4, e8
LU2	30	Undulating rises, 15-20% slopes.	Deep, red, gradational, and uniform, medium textured soils and non cracking clays with hardsetting surfaces; clay loam to light clay, massive to weakly structured, medium A horizons; often with clay loam to light clay, medium to thick massive B1 horizons; light clay B horizons, with strong polyhedral structure; few to common ironstone gravel may be present; acid to neutral soil reaction trend. Red Ferrosols.	Closed forest. "Softwood scrub" species.	VI m4, ps3, nd3, ts6, e6
LU3	20	Crests and upper slopes, 5-10%.	Deep, red, uniform, medium textured and gradational soils with soft to hardsetting surfaces; sandy loam to clay loam, medium A horizons; clay loam to light clay B horizons; massive to weakly structured throughout profile; acid soil reaction trend. Red Kandosols.	Closed forest. "Softwood scrub" species.	IV m4, ps3, nd3, e3-4

HURDLE (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU4	<5	Midslopes, 10-15%. Rock outcrop common. Surface stone may be present.	Very shallow to shallow, brown and red, gradational soils and non cracking clays with hardsetting surfaces; sandy clay loam to clay loam, medium A horizons; clay loam to light clay B horizons; ironstone gravel and sandstone gravel common throughout profile; acid soil reaction trend. Red and Brown Ferrosols and Dermosols.	Closed forest. "Softwood scrub" species.	VI-VII m6, pd3-4, ps3, nd3, ts4, r4-5, e6
LU5	20	Mid and lower slopes, 10-15%.	Moderately deep, red mottled, brown, gradational and non cracking clays with firm to hardsetting surfaces; clay loam to light clay, thick A horizons, usually with bleached A2 horizons; light clay B horizons, usually with cobble and stone; acid soil reaction trend. Brown Dermosols.	Closed forest. "Softwood scrub" species.	VI m3-4, ps3, nd3, ts4, e6
LU6	5	Crests and upper slopes, 5-10%. Stone may be common on surface.	Moderately deep, red mottled, grey and brown, non sodic duplex soils with firm to hardsetting surfaces; sandy clay loam to clay loam, thick to very thick A horizons, with bleached A2 horizons; light clay to medium clay B horizons; acid soil reaction trend. Grey and Brown Chromosols.	Shrubby open forest. "Softwood scrub" species, narrow-leaved ironbark and grey gum.	III-IV m4, ps3, r2-4, nd3, e3-4
LU7	5	Upper and midslopes, 8-12%.	Deep, red, non sodic duplex and gradational soils with firm to hardsetting surfaces; sandy clay loam to clay loam, thick A horizons, occasionally with bleached A2 horizons; light to light medium clay B horizons; acid soil reaction trend. Red Chromosols and Dermosols.	Closed forest. "Softwood scrub" species.	III-IV m3, ps3, nd3, e3-4
LU8	5	Mid to lower slopes, 10-15%.	Moderately deep to deep, often mottled, brown and yellow, non sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, thick A horizons, usually with bleached A2 horizons; medium clay B horizons; acid soil reaction trend. Brown and Yellow Chromosols.	Closed forest. "Softwood scrub" species.	VI m6, ps3, nd3, ts4, e6
LU9	<5	Lower slopes and drainage lines, 1-3%.	Deep, black and grey, non cracking clays and sodic duplex soils with hardsetting surfaces; clay loam to light clay, medium A horizons, with bleached A2 horizons; medium clay B horizons; alkaline soil reaction trend. Black and Grey Dermosols and Sodosols.	Eucalypt shrubby woodland. Gum topped box, wilga and "softwood scrub" species.	VI m4 or 6, nd3, ps3, e6
LU10	<5	Cliff-foot slopes, 15-50%. Rock outcrop and surface stone abundant.	Very shallow to shallow, red and brown, gradational and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons; light to light medium clay B horizons; acid soil reaction trend. Red and Brown Dermosols.	Eucalypt woodland to open woodland. Narrow-leaved ironbark, silver-leaved ironbark and spotted gum.	VIII m6, pd4 or 6, nd3, ps3, ts6-8, r4-5, e6-8

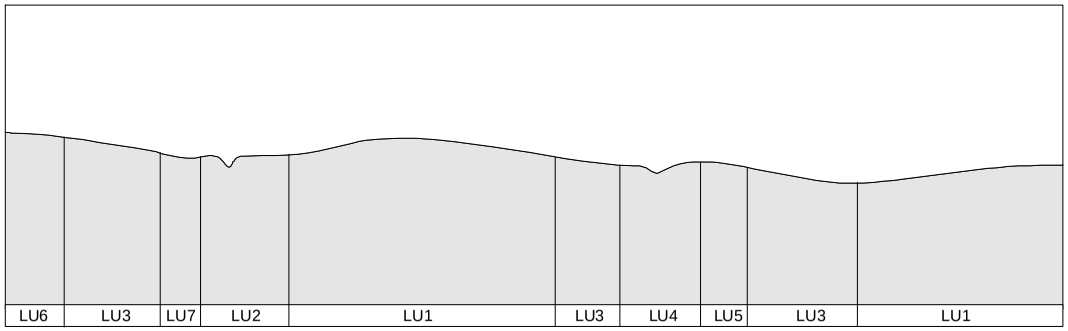
LAND SYSTEM - LONEPINE 1 (Lp1)

General Description: Gently undulating rises on deeply weathered, acidic and intermediate rocks. Major soils are deep, red, brown and grey, sodic duplex soils and red, non sodic duplex soils (Sodosols and Chromosols).

Geology: Deeply weathered, undifferentiated granites.

Landform: Gently undulating rises.

Vegetation: Eucalypt shrubby open forest and eucalypt open forest, limited to extensive clearing. Narrow-leaved ironbark, silver-leaved ironbark, poplar box, rusty gum, gum topped box, wilga, false sandalwood, bulloak, cypress, dogwood and wattle species.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	40	Low crests and upper slopes, 2-4%.	Deep, (often mottled), brown, sodic duplex soils with hardsetting surfaces; loamy coarse sand to sandy clay loam, thick A horizons, with bleached A2 horizons; medium clay B horizons, with rock fragments; alkaline soil reaction trend. Brown Sodosols.	Eucalypt shrubby open forest. Narrow-leaved ironbark, silver-leaved ironbark, rusty gum, gum topped box, bulloak, cypress pine, dogwood and wattles.	VI m6, pd2-3, nd3, e3
LU2	20	Minor drainage lines and lower concave slopes, 1-3%.	Deep, red, brown and grey, sodic duplex soils with hardsetting surfaces; loam to clay loam, medium A horizons, with bleached A2 horizons; light to medium clay B horizons; neutral to alkaline soil reaction trend. Red, Brown and Grey Sodosols.	Eucalypt shrubby open forest. Gum topped box, false sandalwood and bulloak.	VI m6, pd3-4, ps3, nd3, e3
LU3	20	Lower slopes and drainage lines, 1-4%.	Deep, (often mottled), brown, sodic duplex and gradational soils and non cracking clays with hardsetting surfaces; loam to clay loam to light clay, medium A horizons, often with bleached A2 horizons; light to medium clay B horizons, often with quartz grains; neutral to alkaline soil reaction trend. Brown Sodosols and Dermosols.	Eucalypt shrubby woodland. Poplar box, false sandalwood, silver-leaved ironbark, gum topped box and wilga.	IV and VI m4 and 6, pd2-3, ps3, nd3, e3
LU4	10	Lower slopes and minor and major drainage lines, 1-3%.	Deep, red, non sodic duplex soils with hardsetting surfaces; loamy sandy to sandy clay loam, medium to thick A horizons; fine sandy clay loam to light medium clay B horizons, often with quartz grains; acid to neutral soil reaction trend. Red Chromosols.	Eucalypt woodland. Silver-leaved ironbark, Moreton Bay ash and grey gum.	IV and VI m4 or 6, nd3, e3

LONEPINE 1 (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU5	5	Slightly elevated areas, 1-3% slope.	Moderately deep to deep, (sometimes mottled), brown and yellow, sodic and non sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, medium to thick A horizons, with bleached A2 horizons; medium to heavy clay B horizons; rock fragments often throughout profile: acid to neutral soil reaction trend. Brown and Yellow Chromosols.	Eucalypt open forest. Narrow-leaved ironbark, rusty gum and silver-leaved ironbark.	VI m4 or 6, pd2-3, nd3, e2-3
LU6	<5	Slightly elevated areas, 1-3% slope.	Moderately deep to deep, (often mottled), brown, sodic duplex soils with hardsetting surfaces; sand to loamy sand, thick A horizons, with bleached A2 horizons; sandy, light to medium clay B horizons, with rock fragments; acid to neutral soil reaction trend. Brown Chromosols.	Eucalypt open forest. Rusty gum, bulloak, gum topped box and wattles.	VI m6, nd3, e2
LU7	<5	Drainage depressions, 0-1% slope.	Deep, grey and brown, cracking clays with hardsetting or self mulching surfaces; light to medium clay A horizons; medium to heavy clay B horizons; alkaline soil reaction trend. Grey and Brown Vertosols.	Eucalypt open woodland. Poplar box and wilga.	III m3, pm2, e2

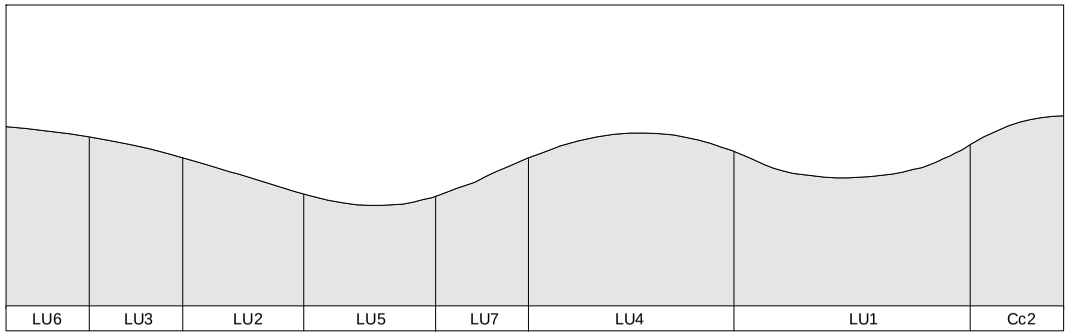
LAND SYSTEM - CLONCLOSE 1 (Cc1)

General Description: Gently undulating rises to undulating rises on duricrusted sediments. Major soils are moderately deep to deep, red, brown, yellow and grey, sodic duplex soils and non sodic duplex soils (Chromosols and Sodosols).

Geology: Czs - Duricrusted sandstone, siltstone, claystone. Some ferricrete and colluvial sand.

Landform: Gently undulating rises to undulating rises.

Vegetation: Eucalypt open forest and shrubby open forest with limited clearing. Spotted gum, narrow-leaved ironbark, rusty gum, gum topped box, bulloak, wattles, red ash and grasstrees.



Cc2 Clonclose 2 land system

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	25	Lower concave slopes, 1-3%.	Deep, often mottled, brown, yellow and grey, sodic duplex soils with hardsetting surfaces; loamy sand to sandy loam, medium to thick A horizons, with bleached A2 horizons; medium clay B horizons; medium gravel and quartz, usually throughout profile; acid, neutral and alkaline soil reaction trend. Brown, Yellow and Grey Sodosols.	Eucalypt shrubby open forest. Narrow-leaved ironbark, rusty gum, gum topped box, bulloak and wattles.	VI m6, nd3, e4
LU2	20	Mid and upper slopes, 2-4%.	Deep, often mottled, red and brown, non sodic and sodic duplex soils and gradational soils with hardsetting surfaces; fine sandy loam to sandy clay loam, medium A horizons; medium clay B horizons; acid to neutral soil reaction trend. Red and Brown Chromosols and Kandosols.	Eucalypt shrubby open forest. Spotted gum, narrow-leaved ironbark, brown bloodwood, gum topped box, red ash, cypress pine and wattles.	VI m6, ps3, nd3, e4
LU3	20	Upper slopes, 1-3%.	Moderately deep to deep, often mottled, grey and brown, sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, medium to thick A horizons, with bleached A2 horizons; light to medium clay B horizons; neutral to alkaline soil reaction trend. Grey and Brown Sodosols.	Eucalypt open forest. Narrow-leaved ironbark, rusty gum, gum topped box, bulloak, paper bark tea-tree and wattles.	VI m6, nd3, e4

CLONCLOSE 1 (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU4	20	Ridges, and upper slopes, 2-6%.	Shallow to moderately deep, usually mottled brown, sodic duplex soils with hardsetting surfaces; sandy loam, medium to thick A horizons, sometimes with bleached A2 horizons; medium clay B horizons; few to many medium gravel and quartz throughout profile; acid soil reaction trend. Brown Sodosols.	Eucalypt open forest. Spotted gum, narrow-leaved ironbark, rusty gum, brown bloodwood, dogwood and wattles.	VI m6, nd3, e4
LU5	5	Lower slopes and drainage lines, 1-3%.	Moderately deep, red and brown, sodic duplex soils with hardsetting surfaces; fine sandy loam to clay loam, medium A horizons, with bleached A2 horizons; medium to heavy clay B horizons; usually common medium gravel throughout profile; acid to soil reaction trend. Red and Brown Sodosols.	Eucalypt open forest. Gum topped box, narrow-leaved ironbark, spotted gum, bulloak and wattles.	VI m6, ps3, nd3, e4
LU6	5	Flat ridge crests, 1-3% slope.	Moderately deep to deep, mottled, grey and brown, sodic and non sodic duplex soils with hardsetting surfaces; coarse sandy loam, medium A horizons, with bleached A2 horizons; medium clay B horizons; usually with few to common medium gravel and quartz throughout profile; acid to neutral soil reaction trend. Grey and Brown Chromosols and Sodosols.	Open forest. Rusty gum, bulloak, Queensland blue gum, pink bloodwood and grass trees.	VI m6, nd3, e4
LU7	5	Mid to lower slopes, 2-5%.	Deep, usually mottled brown, sodic duplex soils with hardsetting surfaces; coarse sandy loam, medium to thick A horizons, with bleached A2 horizons; sandy clay B horizons; few to common medium quartz throughout profile; acid soil reaction trend. Brown Sodosols and Chromosols.	Eucalypt open forest. Narrow-leaved ironbark, brown bloodwood, rusty gum, Queensland peppermint, wattles and red ash.	VI m6, nd3, e4

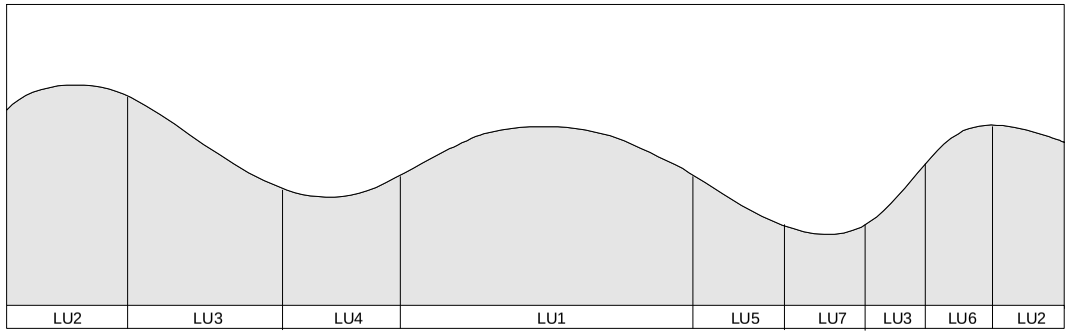
LAND SYSTEM - CLONCLOSE 2 (Cc2)

General Description: Undulating low hills to rolling low hills on duricrusted sediments. Major soils are shallow to moderately deep, brown and grey, sodic and non sodic duplex and gradational soils (Kandosols, Chromosols, Sodosols and Dermosols).

Geology: Czs - Duricrusted sandstone, siltstone, claystone, some ferricrete and colluvial sand.

Landform: Undulating low hills to rolling low hills, with many smaller areas of mesas and cuestas.

Vegetation: Eucalypt open forest and shrubby open forest with limited clearing. Spotted gum, narrow-leaved ironbark, rusty gum, brown bloodwood, rosewood, wattles, thready bark she-oak, budgeroo and dogwood.



* Note: Land units 2, 3 and 6 are often the major components of the mesas and cuestas of this land system.

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	30	Ridges and upper slopes, 4-8%. Scattered areas of rock outcrop.	Shallow to moderately deep, grey and brown, gradational and non sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, medium A horizons, often with bleached A2 horizons; clay loam fine sandy to sandy clay B horizons; often ironstone gravel throughout profile; acid soil reaction trend. Grey and Brown Kandosols and Chromosols.	Eucalypt shrubby open forest. Narrow-leaved ironbark, spotted gum, brown bloodwood, quinine, red ash and wattles.	VI m6, pd2-3, nd3, r2-4, e4
LU2	20-30	Ridges and upper slopes, 4-8%. Rock outcrop common.	Shallow, brown, non sodic and sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, medium to thick A horizons, occasionally with bleached A2 horizons; sandy light clay B horizons, often with ironstone gravel and quartz; acid soil reaction trend. Brown Sodosols and Chromosols.	Eucalypt shrubby open forest. Spotted gum, narrow-leaved ironbark, brown bloodwood, rusty gum, pink bloodwood, gum topped box, budgeroo, dogwood, thready bark she-oak and wattles.	VI-VII m6, pd3-4, nd3, ts4, r4-5, e6
LU3	20-40	Upper slopes and scarps, 8-12%, some areas as steep as 25%. Rock outcrop common.	Shallow, often mottled, brown, sodic duplex soils with hardsetting surfaces; sandy loam to coarse sandy loam, medium A horizons, often with bleached A2 horizons; sandy, light to medium clay B horizons; pebbles and gravel usually throughout profile; acid to neutral soil reaction trend. Brown Sodosols and Chromosols.	Eucalypt open forest. Spotted gum, narrow-leaved ironbark, rusty gum, brown bloodwood, dogwood and wattles.	VI-VII m6, pd4, nd3, ts4 and 6-7, r4-5, e6

CLONCLOSE 2 (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU4	10	Lower slopes and drainage lines, 1-4%.	Deep, often mottled, brown, sodic duplex soils with hardsetting surfaces; fine sandy loam to fine sandy clay loam, medium A horizons, often gravelly, with bleached A2 horizons; medium clay B horizons; acid to neutral soil reaction trend. Brown Sodosols.	Eucalypt shrubby open forest. Spotted gum, narrow-leaved ironbark, rusty gum, pink bloodwood and wattles.	VI m6, ps3, nd3, e6
LU5	5	Mid slopes, 1-4%. Surface stone sometimes present.	Shallow, brown, gradational soils, non cracking clays and occasionally non sodic duplex soils with hardsetting surfaces; clay loam to light clay, medium A horizons; light to medium clay B horizons; acid to neutral soil reaction trend. Brown Dermosols (occasionally Chromosols).	Eucalypt shrubby open woodland. Narrow-leaved ironbark and wattles.	IV m6, pd2-3, ps3, nd3, r1-3, e4
LU6	5-25	Ridge crests and upper slopes, 4-10%, some areas as steep as 20%.	Shallow to moderately deep, grey, sodic duplex soils with hardsetting surfaces; loamy sand to sandy loam, medium A horizons; medium clay B horizons; usually medium gravel throughout profile; acid to neutral soil reaction trend. Grey Sodosols.	Eucalypt shrubby open woodland. Rosewood, rusty gum, narrow-leaved ironbark and wattles.	VI m6, pd3-4, nd3, ts4 or 6, e4 or 6
LU7	10	Ridges and upper slopes, 4-8%. Scattered areas of rock outcrop.	Shallow to moderately deep, grey and brown, gradational soils and non sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, medium A horizons, often with bleached A2 horizons; clay loam fine sandy to sandy clay B horizons; often ironstone gravel throughout profile; acid soil reaction trend. Grey and Brown Kandosols and Chromosols.	Eucalypt shrubby open forest. Narrow-leaved ironbark, spotted gum, brown bloodwood, quinine, red ash and wattles.	VI m6, pd2-3, ps3, ts3-4, r1-4, e4

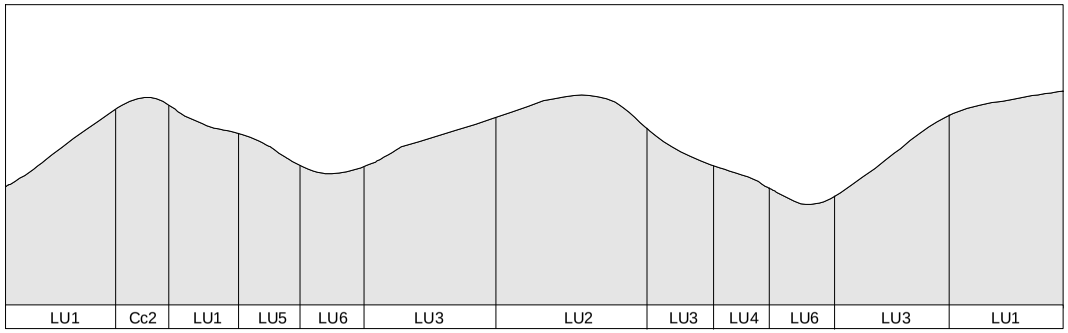
LAND SYSTEM - LONEPINE 2 (Lp2)

General Description: Undulating low hills to low rolling hills on deeply weathered acidic and intermediate intrusive rocks. Major soils are shallow to deep, red and brown, non sodic and sodic duplex soils and shallow to moderately deep, uniform, coarse textured soils (Chromosols, Sodosols and Tenosols).

Geology: Deeply weathered, undifferentiated granites.

Landform: Undulating low hills to rolling low hills.

Vegetation: Eucalypt open forest to woodland and shrubby open forest with limited clearing. Spotted gum, narrow-leaved ironbark, bloodwoods, Moreton Bay ash, rusty gum, red ash, wattles and dogwood.



Cc2 – Clonclose 2 land system

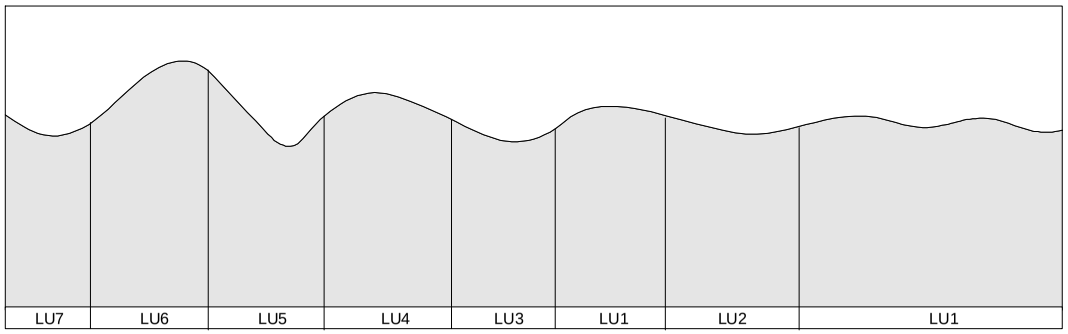
Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	20	Upper slopes, 3-8%, some as steep as 15%.	Moderately deep to deep, red and brown, non sodic and sodic duplex soils (occasionally uniform, coarse textured soils) with hardsetting surfaces; sandy loam to sandy clay loam, medium to thick A horizons, usually with bleached A2 horizons; sandy, medium clay B horizons; rock fragments usually throughout profile; acid soil reaction trend. Red and Brown Chromosols and Sodosols (occasionally Orthic Tenosols).	Eucalypt shrubby open forest. Spotted gum, narrow-leaved ironbark, brown bloodwood, Queensland peppermint, white mahogany with red ash, wattles and thready bark she-oak.	VI m6, nd3, (ts4), e3-4
LU2	20	Ridge crests and upper slopes, 6-12%, some as steep as 20%.	Moderately deep to deep, usually mottled, brown, non sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, medium A horizons, occasionally with bleached A2 horizons; sandy, medium clay B horizons; quartz grains usually throughout; acid soil reaction trend. Brown Chromosols.	Eucalypt shrubby open forest. Spotted gum, brown bloodwood, narrow-leaved ironbark with forest she-oak, rusty gum, grey gum, white mahogany, red ash and wattles.	VI m6, nd3, ts4 or 6, e3-4 or 6
LU3	35	Mid and lower slopes, 10-15%, some as steep as 25%.	Shallow to moderately deep, red and brown, sodic and non sodic duplex soils, and uniform, coarse textured soils with hardsetting surfaces; coarse sand to loamy sand, very thick A horizons, usually with bleached A2 horizons; coarse sand to sandy light clay B horizons; rock fragments usually throughout; acid soil reaction trend. Red and Brown Chromosols and Leptic Tenosols.	Eucalypt woodland. Narrow-leaved ironbark, pink bloodwood, Moreton Bay ash, rusty gum with dogwood and wattles.	VI-VII m6, nd3, pd2-3, ts6-7, e6-7

LONEPINE 2 (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU4	10	Lower ridge crests and slopes, 4-8%.	Moderately deep, red, gradational, non sodic and sodic duplex soils with hardsetting surfaces; loam to clay loam, medium A horizons; light to medium clay, massive to strongly structured B horizons; ironstone gravel often throughout profile; acid to neutral soil reaction trend. Red Kandosols, Dermosols and Chromosols.	Eucalypt woodland. Narrow-leaved ironbark, pink bloodwood, gum with quinine, red ash and wattles.	IV or VI m4, ps3, nd3, e3
LU5	5	Medium and upper slopes, 3-6%. Rock outcrop and surface stone may be present.	Moderately deep to deep, usually mottled, yellow and grey, sodic duplex soils with hardsetting surfaces; fine sandy loam to loam fine sandy, medium A horizons, with bleached A2 horizons; sandy light to light medium clays B horizons, with rock fragments; neutral to alkaline soil reaction trend. Yellow and Grey Sodosols and Chromosols.	Eucalypt open forest. Narrow-leaved ironbark, pink bloodwood with Queensland blue gum, Moreton Bay ash and bulloak.	VI-VII m6, ps3, nd3, r2-5, e4
LU6	10	Midslopes, 6-12%.	Deep, brown, black and grey, gradational and sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, thin to medium A horizons, sometimes with bleached A2 horizons; sandy, light to medium clay B horizons; alkaline soil reaction trend. Brown, Black and Grey Dermosols and Sodosols.	Eucalypt open forest. Rough-barked apple, Queensland blue gum and Moreton Bay ash.	VI m6, ps3, nd3, e3

LAND SYSTEM - WINGFIELD 2 (Wf2)

General Description: Rolling hills to steep hills on deeply weathered acidic rocks. Major soils are shallow to deep, red earths and non sodic duplex soils and moderately deep to deep, brown, non sodic, sodic duplex and gradational soils (Kandosols, Chromosols and Dermosols).
Geology: Wingfield Adamellite (Lateritised and metamorphosed).
Landform: Rolling hills to steep hills.
Vegetation: Eucalypt shrubby woodland and woodland with limited clearing. Spotted gum, narrow-leaved ironbark, bloodwoods, budgeroo, wattles and *Casuarina* species.



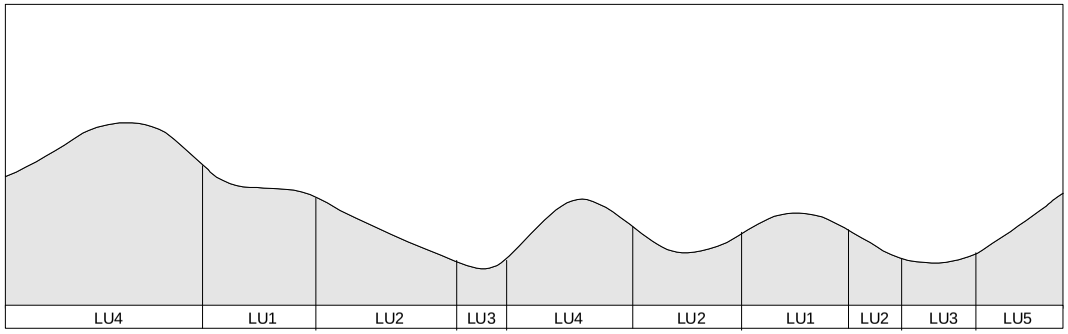
Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	40	Crests, ridges and upper slopes, 5-10%. Rock outcrop may be present.	Deep, red, gradational and non sodic duplex soils with hardsetting surfaces; clay loam, thick, massive A horizons; light medium clay, weakly to moderately structured B horizons, often with rock fragments; acid to neutral soil reaction trend. Red Kandosols and Chromosols.	Eucalypt shrubby woodland. Spotted gum, narrow-leaved ironbark, gum topped bloodwood and budgeroo.	IV m3-4, ps3, nd3, r1-3, e2-3
LU2	5	Mid to lower slopes, on higher ridges, 5-12%. Rock outcrop may be present.	Deep, brown and yellow, gradational and non sodic duplex soils with hardsetting surfaces; clay loam, thick A horizons; light to medium clay B horizons, often with quartz grains; acid to neutral soil reaction trend. Brown and Yellow Dermosols and Chromosols.	Eucalypt shrubby woodland. Narrow-leaved ironbark, gum topped bloodwood, budgeroo, red ash and other "scrub" species.	III m3, ps3, nd3, r1-3, e3
LU3	5	Lower concave slopes, 5-10%. Surface coarse fragments common. Rock outcrop may be present.	Moderately deep, brown and black, non sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, medium A horizons; clay loam to light clay B horizons; rock fragments usually throughout; acid to neutral soil reaction trend. Brown and Black Chromosols.	Eucalypt woodland. Spotted gum and narrow-leaved ironbark.	IV m4, ps3, nd3, r3-4, e3

WINGFIELD 2 (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU4	20	Crests and upper slopes, 10-20%. Rock outcrop abundant in places.	Shallow to deep, red, gradational and non sodic duplex soils with hardsetting surfaces; loam to clay loam, medium to thick A horizons; light clay B horizons; ironstone gravel frequently throughout profile; acid soil reaction trend. Red Chromosols and Dermosols.	Eucalypt woodland. Spotted gum and narrow-leaved ironbark.	VI m3-4, pd1-3, ps3, nd3, ts6, r2-4, e6
LU5	20	Upper to lower slopes, 30-50%. Rock outcrop abundant.	Shallow, red, gradational and non sodic duplex soils with hardsetting surfaces; loam to clay loam, medium A horizons; light clay B horizons; ironstone gravel common throughout profile; acid soil reaction trend. Red Chromosols and Dermosols.	Eucalypt shrubby woodland. Spotted gum, narrow-leaved ironbark, bloodwoods, budgeroo and *Casuarina* species.	VII-VIII m6, pd3-4, ps3, nd3, ts7-8, r5, e7
LU6	5	Crests and slopes, 10-20%. Rock outcrop and surface stone common.	Very shallow to shallow, uniform, medium textured soils over rock, and brown, non sodic duplex soils with hardsetting surfaces; clay loam, medium A horizons; (if present) light clay to medium clay B horizons; ironstone gravel and rock fragments usually throughout profile; acid soil reaction trend. Leptic Rudosols and Brown Chromosols.	Eucalypt open forest. Narrow-leaved ironbark, spotted gum, bloodwoods, wattles and red ash.	VI-VII m6, pd3-4, ps3, nd3, ts6, r4-5, e6
LU7	5	Mid and lower slopes, 5-15%.	Moderately deep to deep, brown, gradational soils and sodic duplex soils with hardsetting surfaces; clay loam to light clay, thick A horizons, often with bleached A2 horizons; light to medium clay B horizons; neutral to alkaline soil reaction trend. Brown Dermosols and Chromosols.	Eucalypt open forest. Gum-topped box, spotted gum, narrow-leaved ironbark with wattles.	VI m4, ps3, nd3, e6

LAND SYSTEM - MUNCON 1 (Mc1)

General Description: Undulating rises on intermediate and basic volcanic rocks. Major soils are shallow to deep, black, brown and grey, cracking clays and red and brown, gradational soils and non cracking clays (Vertosols and Dermosols).
Geology: Muncon Volcanics - Intermediate basic lava, tuff, agglomerate, siltstone, lithic arenite, conglomerate, mudstone.
Landform: Undulating rises.
Vegetation: Brigalow open forest, usually completely cleared. Brigalow and "softwood scrub" species.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	30	Crests, broad ridges and upper slopes, 1-8%. Some upper slopes as steep as 15%.	Shallow, brown and black, cracking and non cracking clays with self mulching to hardsetting surfaces; light clay, medium A horizons; light medium clay B horizons; alkaline soil reaction trend. Brown and Black Vertosols.	Brigalow open forest. Brigalow and "softwood scrub" species.	III-IV m3-4, pd3-4, ps2-3, pm2, e2-4
LU2	35	Mid and lower slopes, 6-12%.	Moderately deep to deep, grey and brown, cracking clays with hardsetting to self mulching surfaces; light clay A horizons; medium clay B horizons; alkaline soil reaction trend. Grey and Brown Vertosols.	Brigalow open forest. Brigalow and "softwood scrub" species.	III-IV m2-3, pm2, e3-4
LU3	5	Lower slopes, 3-8%.	Deep, brown and grey, cracking clays with self mulching to hardsetting surfaces; light clay A horizons; medium clay B horizons; acid or alkaline soil reaction trend. Brown and Grey Vertosols.	Brigalow open forest. Brigalow and "softwood scrub" species.	III m2-3, pm2, e2-3
LU4	15	Ridges, crests and upper slopes, 3-8%. Few to common medium to large pebbles may be present on surface.	Shallow to moderately deep, red and brown, gradational soils and non cracking clays with firm to hardsetting surfaces; clay loam to light clay, medium A horizons; medium clay B horizons; few to many, small to medium pebbles may be present in profile; neutral to alkaline soil reaction trend. Red and Brown Dermosols.	Brigalow open forest. Brigalow, bottle trees and other "softwood scrub" species, occasionally with silver-leaved ironbark.	III-IV m3-4, pd2-3, ps3, (r2-3), e2-3
LU5	15	Slopes, 6-12%. Few to common pebbles and cobble on surface.	Deep, brown, cracking and non cracking clays with self mulching to hardsetting surfaces, light clay; medium A horizons; medium clay B horizons; alkaline soil reaction trend. Brown Vertosols and Dermosols.	Brigalow open forest. Brigalow and "softwood scrub" species.	III-IV m2-3, ps2-3, pm2, r2-4, e3-4

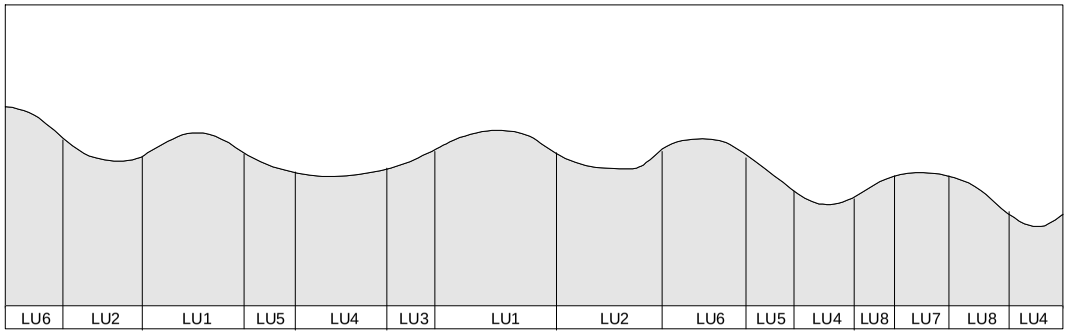
LAND SYSTEM - NOGO 1 (Ng1)

General Description: Undulating rises to undulating low hills on intermediate to basic volcanic rocks. Major soils are moderately deep to deep, black and brown, cracking clays and red and brown, non cracking clays and gradational soils (Vertosols and Dermosols).

Geology: Nogo Beds - Intermediate to basic volcanic rocks with minor arenite, slate, chert and conglomerate.

Landform: Undulating rises to undulating low hills.

Vegetation: Brigalow, "softwood scrub" forest with minor eucalypt woodland, extensively to completely cleared. Brigalow, "softwood scrub" species, belah and minor poplar box and silver-leaved ironbark.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	15	Ridge crests, 1-3%, and upper slopes of 4-10%. Few to many coarse gravel and stone on surface.	Shallow to moderately deep, brown and red, cracking and non cracking clays and gradational soils with hardsetting to self mulching surfaces; clay loam to light clay, thin to medium A horizons; light to medium clay B horizons; neutral to alkaline soil reaction trend. Brown and Red Vertosols and Dermosols.	Forest. "Softwood scrub" species and brigalow.	III-IV m3-4, pd2-3, ps2-3, r2-3, e2-3
LU2	15	Mid and lower slopes, 3-8%. Few to many coarse gravel and stone on surface.	Moderately deep to deep, red and brown, cracking and non cracking clays with self mulching to hardsetting surfaces; light clay, medium A horizons; light to medium clay B horizons; neutral to alkaline soil reaction trend. Red and Brown Dermosols and Vertosols.	Forest. Bottle trees and other "softwood scrub" species.	III m3, ps2-3, r2-3, e2-3
LU3	5	Mid and lower slopes, 3-8%. Few to many ironstone gravel on surface.	Moderately deep to deep, brown, cracking and non cracking clays with hardsetting or self mulching surfaces; light to medium clay A horizons; medium clay B horizons; alkaline soil reaction trend. Brown Vertosols and Dermosols.	Forest. Brigalow.	III m3, ps3, pm2-3, e2-3
LU4	10	Lower concave slopes, 1-3% slope. Normal gilgai may be present.	Moderately deep to deep, black, brown and grey, cracking clays with self mulching or hardsetting surfaces; light clay to light medium clay A horizons; medium clay B horizons; neutral to alkaline soil reaction trend. Black, Brown and Grey Vertosols.	Forest. Brigalow, belah and "softwood scrub" species.	III m3, pm2-3, tm2, e2-3

NOGO 1 (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU5	10	Mid slopes, 4-8%. Ironstone gravel often on surface.	Moderately deep to deep, brown to red, sodic duplex and gradational soils with hardsetting surfaces; clay loam to light clay, medium to thick A horizons, usually gravelly, often with bleached A2 horizons; light to medium clay B horizons; alkaline soil reaction trend. Brown and Red Chromosols, Sodosols and Dermosols.	Forest. "Softwood scrub" species.	IV m4, ps3, e3-4
LU6	5	Crests and upper slopes, 3-6%. Few to common ironstone gravel on surface.	Moderately deep to deep, red and brown, non cracking clays and gradational soils with hardsetting surfaces; clay loam to light clay, medium A horizons, usually with coarse fragments; light to medium clay B horizons usually with coarse fragments; neutral to alkaline soil reaction trend. Red and Brown Dermosols.	Eucalypt shrubby woodland. Poplar box, silver-leaved ironbark, brigalow and wilga.	IV m4, ps3, e3-4
LU7	20	Crests and upper slopes, 1-5%. Normal gilgai may be present.	Moderately deep to deep, black and brown, cracking clays with self mulching surfaces; light clay to light medium clay A horizons; medium clay B horizons; alkaline or acid soil reaction trend. Black and Brown Vertosols.	Forest. Brigalow.	III m3, pm3, tm2, e2
LU8	20	Mid slopes, 5-10%. Normal gilgai may be present.	Moderately deep to deep, brown and black, cracking clays with self mulching surfaces; light clay to light medium clay A horizons; medium clay B horizons; alkaline soil reaction trend. Brown and Black Vertosols.	Forest. Brigalow, belah, limebush and "softwood scrub" species.	III m3, pm3, tm2, e2-3

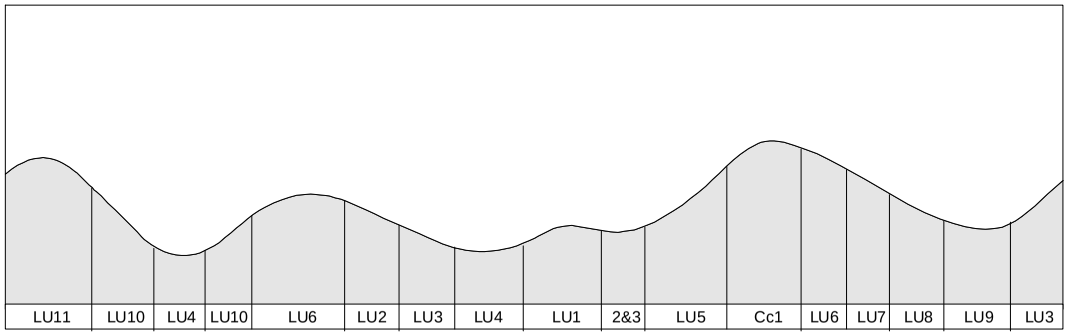
LAND SYSTEM - NARAYEN (Na)

General Description: Undulating rises to undulating low hills on intermediate to basic volcanic rocks. Major soils are moderately deep to deep, brown, black and grey, cracking clays and red and brown, non cracking clays and gradational soils and sodic and non sodic duplex soils (Vertosols, Dermosols and Chromosols).

Geology: Narayen Beds - Intermediate to basic volcanics, minor arenite and conglomerate.

Landform: Undulating rises to undulating low hills with minor rolling low hills.

Vegetation: Brigalow forest and eucalypt woodland, limited to complete clearing. Brigalow, wilga, bottle trees and other "softwood scrub" species, silver-leaved ironbark, narrow-leaved ironbark and poplar box.



Note: Clonclose 1 is also found within this land system

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	10	Crests and ridges, 1-5%. Many to common, medium gravel on surface. Rock outcrop common.	Shallow to moderately deep, red and brown, non cracking and cracking clays with firm to self mulching surfaces; light clay, medium A horizons; medium clay B horizons; neutral soil reaction trend. Red and Brown Dermosols and Vertosols.	Eucalypt shrubby woodland. Bloodwoods, silver-leaved ironbark, bottle trees and wilga.	IV m3-4, pd2-3, pm2, nd2, r4, e2
LU2	10	Mid and upper slopes, 3-6%. Normal gilgai may be present.	Moderately deep to deep, brown, cracking clays with self mulching surfaces; light to medium clay A horizons; medium to heavy clay B horizons, usually with few to many rock fragments and ironstone; alkaline soil reaction trend. Brown Vertosols.	Brigalow forest. Brigalow, wilga, bottle tree and other "softwood scrub" species.	III m3, pm2, nd2, tm2, e2-3
LU3	30	Mid to lower slopes, 2-6%. Normal gilgai may be present.	Moderately deep to deep, black and grey, cracking clays with self mulching surfaces; light to medium clay A horizons; medium to heavy clay B horizons, usually with few to many rock fragments and ironstone; alkaline soil reaction trend. Black and Grey Vertosols.	Brigalow open forest. Brigalow and wilga.	III m3, pm2-3, nd2, tm2, e2-3
LU4	15	Lower slopes, 1-4%. Normal gilgai.	Deep, black and grey, cracking clays with self mulching surfaces; medium clay A horizons; medium to heavy clay B horizons; alkaline soil reaction trend. Black and Grey Vertosols.	Brigalow open forest. Brigalow and scattered poplar box.	III m3, pm2-3, nd2, tm2, e2

NARAYEN (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU5	5	Upper and mid slopes, 5-10%.	Moderately deep to deep, brown and red, gradational and non sodic duplex soils with hardsetting surfaces; clay loam to light clay, thick to very thick A horizons; light clay to light medium clay B horizons; neutral soil reaction trend. Brown and Red Dermosols and Chromosols.	Brigalow forest. Brigalow, wilga, bottle trees, occasionally with poplar box.	IV or VI m4 or 6, ps3, nd2, e2-3
LU6	5	Upper slopes and crests 4-6%, some slopes as steep as 15-20%. Ironstone may be present on surface.	Shallow to moderately deep, brown and red, non sodic duplex soils with hardsetting surfaces; clay loam, medium A horizons frequently with few to many medium rock fragments; medium to medium heavy clay B horizons; alkaline soil reaction trend. Brown and Red Chromosols.	Eucalypt open forest. Silver-leaved ironbark, scattered poplar box, kurrajong, bloodwoods and narrow-leaved ironbark.	IV and VI m4 or 6, ps3, nd2, (ts6), e3-4 or 6
LU7	5	Midslopes, 6-8%.	Moderately deep to deep, black, brown and red, non sodic duplex soils with hardsetting surfaces; clay loam, medium A horizons; medium clay B horizons, usually with few to many rock fragments; neutral to alkaline soil reaction trend. Black, Brown and Red Chromosols.	Eucalypt woodland. Silver-leaved ironbark and bloodwoods.	IV m4, ps3, nd2, e3
LU8	5	Midslopes, 3-5%.	Moderately deep to deep, brown and black, sodic duplex soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons, usually with bleached A2 horizons; medium clay B horizons, usually with many rock fragments; alkaline soil reaction trend. Brown and Black Sodosols and Dermosols.	Eucalypt woodland. Poplar box, occasionally with sandalwood, wilga and silver-leaved ironbark.	IV and VI m4 or 6, ps3, nd2, e3-4
LU9	5	Lower slopes and drainage lines, 1-3%.	Deep, black and grey, cracking clays with self mulching surfaces; light to medium clay A horizons; medium to heavy clay B horizons; alkaline soil reaction trend. Black and Grey Vertosols.	Eucalypt open woodland. Poplar box, Queensland blue gum and Moreton Bay ash.	III-IV m3-4, pm2-3, nd2, e2-4
LU10	5	Midslopes, 4-6%.	Deep, brown, non sodic and sodic duplex soils with hardsetting surfaces; clay loam, medium A horizons, occasionally with bleached A2 horizons; medium clay B horizons; few to many rock fragments may occur throughout profile; alkaline soil reaction trend. Brown Chromosols.	Eucalypt woodland. Poplar box, minor kurrajong, gum topped box and silver-leaved ironbark.	IV and VI m4 or 6, ps3, nd2, e3-4
LU11	5	Upper slopes and crests, 10-20%.	Shallow to moderately deep, brown and red, sodic and non sodic duplex soils with hardsetting surfaces; clay loam, medium A horizons, with bleached A2 horizons, usually with few to many rock fragments; medium clay B horizons; alkaline soil reaction trend. Brown and Red Chromosols.	Eucalypt woodland. Narrow-leaved ironbark, bloodwoods and silver-leaved ironbark.	VI m4, pd2-3, ps3, nd2, ts6, e6

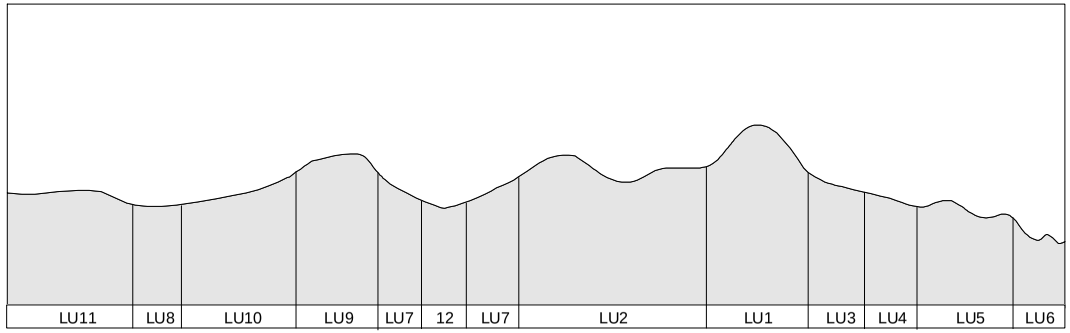
LAND SYSTEM - HINDMARSH 1 (Hm1)

General Description: Undulating rises to rolling low hills on fresh and lateritized basic volcanic rocks. Major soils are shallow to deep, brown, black and grey, cracking clays, non cracking clays and red, gradational soils (Vertosols, Dermosols and Ferrosols).

Geology: Tertiary basalt, minor andesite.

Landform: Undulating rises, rolling rises, rolling low hills and minor steep low hills.

Vegetation: Brigalow forest, extensive to complete clearing. Brigalow, belah, wilga and other "softwood scrub" species.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	<5	Scarps, crests and upper slopes, 20-50%. Ferricrete cobble and outcrop common.	Shallow to deep, red, gradational soils with hardsetting surfaces; clay loam to light clay, medium A horizons; light clay B horizons; ironstone nodules common throughout; acid soil reaction trend. Red Ferrosols.	Forest. "Softwood scrub" species.	VI-VIII m3-4, pd2-4, ts6-8, r4-5, e6-7
LU2	30	Broad ridges, crests and upper slopes, 1-10%.	Moderately deep to deep, red, gradational soils with hardsetting surfaces; clay loam, weak to moderately structured, medium to thick A horizons; light to medium clay, weakly to strongly structured B horizons; acid to neutral soil reaction trend. Red Ferrosols.	Forest. Bottle trees, wilga and "softwood scrub" species.	III-IV m3-4, ps3, e2-3
LU3	<5	Upper slopes, 8-15%. Ferricrete cobble and outcrop may be present.	Moderately deep to deep, red, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium to thick A horizons; light clay B horizons, often ferricrete coarse fragments throughout; acid to neutral soil reaction trend. Red Ferrosols.	Forest. "Softwood scrub" species.	III-IV m3-4, ps3, r2-3, e3-4
LU4	5	Upper and midslopes, 3-8%.	Shallow to moderately deep, red, brown and black, cracking and non cracking clays with self mulching surfaces; light clay to light medium clay A horizons; medium clay B horizons; neutral soil reaction trend. Red and Brown Vertosols and Dermosols.	Forest. "Softwood scrub" species.	III-IV m3-4, pd2-3, pm2-3, e2-3

HINDMARSH 1 (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU5	5	Ridges and mid slopes, 2-6%. Usually basalt and ferricrete cobble on surface.	Shallow to moderately deep, brown, cracking clays with self mulching surfaces; light to light medium clay A horizons; medium clay B horizons; coarse fragments usually throughout; neutral to alkaline soil reaction trend. Brown Vertosols.	Forest. "Softwood scrub" species.	III-IV m3-4, pd2-3, pm2-3, r2-3, e2-3
LU6	<5	Scarps and steep slopes, 10-40%. Surface stone, cobble and rock outcrop common.	Very shallow to shallow, brown and black, cracking and non cracking clays with self mulching to hardsetting surfaces; light clay A horizons; light to medium clay B horizons; neutral soil reaction trend. Brown and Black Vertosols and Dermosols.	Forest. "Softwood scrub" species.	VII m4, pd3-4, pm2-3, ts6-7, r5, e4 or 6
LU7	5	Mid to lower slopes, 7-15%, some slopes as steep as 20%. Rock outcrop may be present.	Moderately deep to deep, red and brown, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons; medium clay B horizons; ironstone coarse fragments common throughout; alkaline soil reaction trend. Brown Dermosols.	Forest. Brigalow, bottle tree and "softwood scrub" species.	VII m3-4, ps2-3, (ts6), r2-4, e3-4
LU8	<5	Lower concave slopes, 2-5%.	Moderately deep to deep, black and brown, cracking clays with self mulching surfaces; light to medium clay A horizons; medium to heavy clay B horizons; alkaline soil reaction trend. Black Vertosols.	Forest. "Softwood scrub" species and brigalow.	II-III m2-3, pm2-3, e2
LU9	<5	Crests and upper slopes, 5-10%. Stone and cobble and rock outcrop may occur on surface, gilgai may occur.	Shallow to deep, red and brown, gradational soils and non cracking clays with self mulching to firm surfaces; clay loam to light clay, medium A horizons; medium clay B horizons; coarse fragments may occur in profile; neutral to alkaline soil reaction trend. Red and Brown Dermosols.	Forest. "Softwood scrub" species, brigalow and belah.	III-IV m3-4, pd2-3, r2-4, tm2, e2-4
LU10	5	Mid and lower slopes, 3-6%.	Moderately deep to deep, brown and black, cracking clays with self mulching to hardsetting surfaces; light to medium clay A horizons; medium clay B horizons; alkaline soil reaction trend. Brown and Black Vertosols.	Forest. Brigalow, belah and "softwood scrub" species.	III m2-3, pm2-3, e2-3
LU11	30	Lower lying crests, ridges and mid slopes, 2-5%. Normal gilgai and surface rock may be present.	Moderately deep to deep, black, brown and grey, cracking (occasionally non cracking clays and duplex soils) with self mulching to loose surfaces; light to medium clay A horizons (occasionally clay loam); medium clay B horizons; alkaline soil reaction trend (acid trend may occur). Black, Brown and Grey Vertosols (occasionally Dermosols and Chromosols).	Shrubby forest. Belah, bottle trees, brigalow, wilga and other "softwood scrub" species.	II-III m2-3, pm2-3, r2-3, tm2, e2
LU12	5	Lower concave slopes, 5-10%. Basalt rock may be present on surface.	Moderately deep to deep, red and brown, gradational soils and non cracking clays with firm to hardsetting surfaces; clay loam to light clay, medium to thick A horizons; medium clay B horizons; usually with rock fragments throughout; neutral to alkaline soil reaction trend. Red and Brown Dermosols.	Forest. "Softwood scrub" species.	III-IV m3-4, ps3, r2-3, e3-4

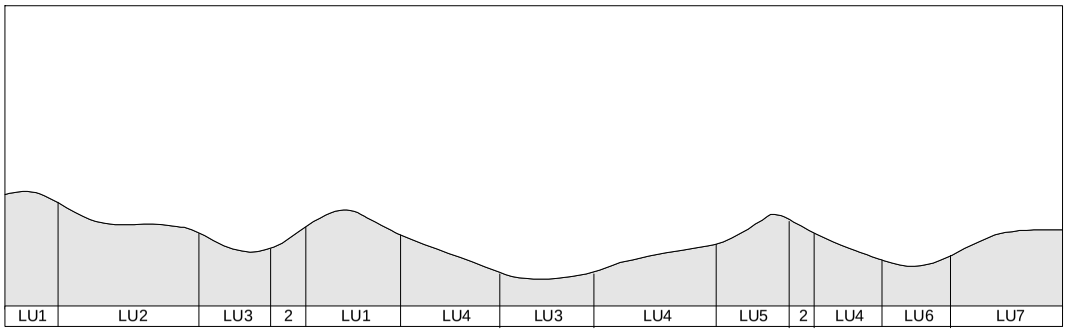
LAND SYSTEM - DELUBRA 1 (Db1)

General Description: Undulating low hills on basic intrusive rocks. Major soils are moderately deep to deep, black and brown, cracking clays, and shallow to moderately deep, red and brown, gradational soils and non cracking clays with minor red to brown, sodic duplex soils (Vertosols, Dermosols, Chromosols and Sodosols).

Geology: Delubra Quartz Gabbro.

Landform: Undulating low hills.

Vegetation: Brigalow, belah forest, extensive clearing. Major species are brigalow, belah, wilga and "softwood scrub" species.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	20	Crests and upper slopes, 3-8%. Rock outcrop and surface stone common.	Very shallow to shallow, red and brown, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium, gravelly A horizons; light clay B horizons; neutral soil reaction trend. Red and Brown Dermosols.	Forest. Wilga, brigalow, belah, red ash and other "softwood scrub" species.	V1-VII m6, pd4 or 6, nd3, r4-5, e2-3
LU2	25	Crests, upper and midslopes, 3-8%.	Moderately deep to deep, red and brown, sodic duplex and gradational soils with hardsetting surfaces; clay loam, medium to thick A horizons; medium clay B horizons; neutral to alkaline soil reaction trend. Red and Brown Chromosols, Sodosols and Dermosols.	Forest. Brigalow, belah, wilga and "softwood scrub" species.	IV or VI m4 or 6, pd2-3, nd3, e3-4
LU3	5	Lower slopes and drainage depressions, 1-3% slope (some slopes as steep as 6%). Normal gilgai may occur.	Deep, black and brown, cracking clays with self mulching surfaces; light to medium clay A horizons; medium to heavy clay B horizons, ironstone and gravel often throughout; alkaline soil reaction trend. Black and Brown Vertosols.	Forest. Brigalow, belah, wilga, bottle tree and "softwood scrub" species.	III m3, pm2-3, nd3, tm2, e2
LU4	25	Mid and lower slope positions, 2-6%. Normal gilgai may be present.	Moderately deep to deep, brown, red and black, cracking clays with self mulching surfaces; light to medium clay A horizons; light to medium clay B horizons, occasionally with coarse fragments; alkaline soil reaction trend. Brown, Red and Black Vertosols.	Forest. Brigalow, belah, wilga, bottle trees and "softwood scrub" species.	III m3, pm2-3, nd3, tm2, nd3, e2-3

DELUBRA 1 (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU5	10	Mid and upper slopes, 3-8% (up to 15% on some scarps).	Shallow to deep, red, gradational soils with hardsetting surfaces; clay loam, medium A horizons; light medium clay B horizons; usually with ironstone gravel throughout; neutral soil reaction trend. Red Dermosols.	Eucalypt woodland. Silver-leaved ironbark and Moreton Bay ash.	IV m4, pd2-3, nd3, ps3, e3-4
LU6	5	Lower concave slopes, 1-3%. Normal gilgai may be present.	Deep, brown and grey, cracking and non cracking clays with hardsetting to self mulching surfaces; light clay to medium clay (occasionally clay loam) A horizons; medium to heavy clay B horizons, usually with coarse fragments; alkaline soil reaction trend. Brown and Grey Vertosols and Dermosols.	Open Forest. Belah, poplar box, wilga and scattered brigalow.	III m3, pm2-3, tm2, e2
LU7	10	Broad ridges and mid and upper slopes, 3-6%.	Moderately deep to deep, brown, sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium A horizons usually gravelly, with bleached A2 horizons; sandy clay to medium clay B horizons; alkaline soil reaction trend. Brown Chromosols and Sodosols.	Eucalypt open woodland. Silver-leaved ironbark, pink bloodwood and minor narrow-leaved ironbark.	VI m6, pd4, ps3, e3-4

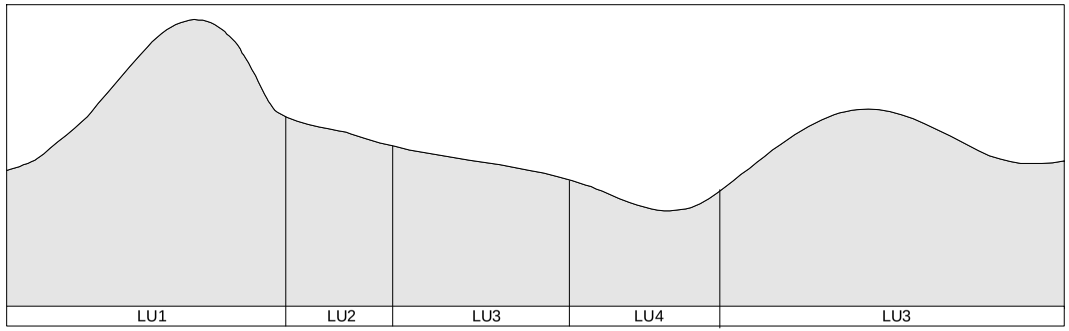
LAND SYSTEM - BRUMBY (Bb)

General Description: Undulating rises with steep low hills on basic and intermediate volcanic rocks. Major soils are deep, red and brown, non cracking clays and very shallow to shallow red, gradational soils (Dermosols and Kandosols).

Geology: Camboon Andesite - Andesitic, basaltic and trachytic lava, tuff, agglomerate, conglomerate, lithic arenite, siltstone, mudstone.

Landform: Undulating rises with some residual ridges.

Vegetation: "Softwood scrub" forest and eucalypt shrubby woodland with limited clearing on the residual ridge crests and completely cleared on lower slopes. "Softwood scrub" species, brigalow and wilga, narrow-leaved ironbark, rosewood and wattles.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	30	High residual ridge crests with steep slopes, 20-40%. Abundant ironstone gravel. Rock outcrop.	Very shallow to shallow, red, gradational soils with hardsetting surfaces; clay loam, medium A horizons; light clay, weakly to moderately structured B horizons; usually with common to abundant ironstone gravel throughout profile; acid soil reaction trend. Red Dermosols and Kandosols.	"Softwood scrub" forest and eucalypt woodland. "Softwood scrub" species, narrow-leaved ironbark, rosewood and wattles.	VII m6, pd4-6, ps3, nd3, ts6-7, r5, e6
LU2	10	Upper to midslopes below steep crests, 6-12%. Ironstone gravel usually on surface.	Shallow, red, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium to thick A horizons; light clay to light medium clay B horizons; usually common to abundant medium to coarse gravel throughout profile; acid soil reaction trend. Red Dermosols.	"Softwood scrub" forest. "Softwood scrub" species.	IV m4, pd2-4, ps3, r2-3, e3-4
LU3	50	Midslopes and broad ridges, 3-8%.	Deep, red, non cracking clays with firm to hardsetting surfaces; light clay, medium to thick A horizons; medium clay B horizons; neutral to alkaline soil reaction trend. Red Dermosols.	"Softwood scrub" forest. "Softwood scrub" species.	III m3, ps3, e2-3
LU4	10	Lower slopes and drainage lines, 2-5% slope.	Deep, red and brown, non cracking clays (minor cracking clays with self mulching surfaces) with hardsetting surfaces; light clay, medium A horizons; medium clay B horizons; neutral to alkaline soil reaction trend. Red and Brown Dermosols (minor Vertosols).	Brigalow forest. Brigalow, wilga and "softwood scrub" species.	III m3, ps3, e3

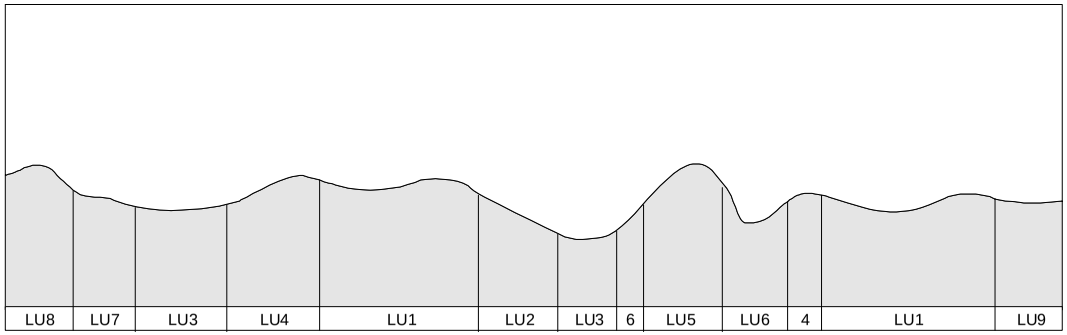
LAND SYSTEM - HINDMARSH 2 (Hm2)

General Description: Undulating rises to rolling rises on basic volcanic rocks. Major soils are shallow to deep, black, cracking clays, very shallow to shallow, black and brown, non cracking clays and shallow to moderately deep, red, gradational soils and non cracking clays (Vertosols, Dermosols and Ferrosols).

Geology: Tertiary basalt.

Landform: Undulating rises to rolling rises.

Vegetation: Eucalypt woodland, extensively cleared to completely cleared. Silver-leaved ironbark, narrow-leaved ironbark, mountain coolabah, Moreton Bay ash and bloodwoods.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	35	Crests, upper and mid slopes, 1-5%. Often basalt stone on surface. Minor linear gilgai.	Shallow to moderately deep, black, cracking clays with self mulching surfaces; light to medium clay A horizons; medium to heavy clay B horizons; alkaline soil reaction trend. Black Vertosols.	Eucalypt woodland to open woodland. Silver-leaved ironbark and narrow-leaved Ironbark.	III-IV m3-4, pd2-3, pm2-3, r2, (tm2), e2
LU2	20	Mid slopes, 5-10%. Usually few basalt stone on surface. Linear gilgai.	Moderately deep to deep, black, (brown on mounds of linear gilgai) cracking clays with self mulching surfaces; light clay to medium clay A horizons; medium to heavy clay B horizons; alkaline soil reaction trend. Black Vertosols.	Eucalypt woodland. Silver-leaved ironbark, narrow-leaved ironbark, mountain coolabah and Moreton Bay ash.	III m2-3, pd2-3, pm2-3, r2, tm2, e2-3
LU3	10	Lower slopes and broad drainage lines, 1-3%. Linear gilgai may be present on lower slopes. Basalt stone may be present.	Deep, black, cracking clays with self mulching surfaces; medium clay A horizons; medium to heavy clay B horizons; alkaline soil reaction trend. Black Vertosols.	Eucalypt woodland. Silver-leaved ironbark.	II-III m2, pm2-3 (r2), (tm2), e2
LU4	10	Crests and upper slopes 1-5%, with some slopes up to 10%. Few to abundant basalt stone on surface.	Very shallow to shallow, black and brown, cracking and non cracking clays with self mulching to firm surfaces; light clay A horizons; light to medium clay B horizons, with basalt stone and gravel often throughout profile; neutral to alkaline soil reaction trend. Black and Brown Vertosols and Dermosols.	Eucalypt woodland. Silver-leaved ironbark, narrow-leaved ironbark and bloodwoods.	IV, V or VI m4 or 6, pd4 or 6, pm2-3, r3-5, e2-3

HINDMARSH 2 (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU5	5	Upper slopes and crests, 8-20%. Basalt stone and outcrop abundant on surface.	Very shallow to shallow, black and brown, non cracking and cracking clays with firm to self mulching surfaces; light clay A horizons; light clay B horizons; stone and gravel throughout profile; neutral soil reaction trend. Black and Brown Dermosols and Vertosols.	Eucalypt woodland. Narrow-leaved ironbark, silver-leaved ironbark and mountain coolabah.	VI-VII m4 or 6, pd4 or 6, pm2, ts4-6, r4-5, e6
LU6	5	Mid and lower slopes, 8-12%. Basalt stone and outcrop may be present.	Shallow to moderately deep, black and brown, cracking clays with self mulching surfaces; light clay A horizons; light to medium clay B horizons, usually with stone and gravel; neutral to alkaline soil reaction trend. Black and Brown Vertosols.	Eucalypt woodland. Silver-leaved ironbark, narrow-leaved ironbark and mountain coolabah.	III-IV m3-4, pd2-4, pm2, r2-4, e3-4
LU7	5	Mid slopes, 5-10%.	Moderately deep to deep, red, cracking and non cracking clays with self mulching surfaces; light clay A horizons; light to light medium clay B horizons; neutral soil reaction trend. Red Vertosols and Ferrosols.	Eucalypt woodland. Silver-leaved ironbark, Moreton Bay ash, kurrajong, poplar box and corkwood.	III-IV m3-4, pm2, e3
LU8	5	Hill crests and upper slopes, 10-15%. Basalt rock common on surface.	Shallow to moderately deep, red, gradational soils and non cracking clays; clay loam to light clay A horizons; light clay to light medium clay B horizons, with coarse fragments usually present; neutral soil reaction trend. Red Ferrosols.	Eucalypt scrubby woodland. Narrow-leaved ironbark, silver-leaved ironbark and “softwood scrub” species.	V1 m4, pd2-3, ps3, r3-4, e6
LU9	5	Gently undulating rises bordering Wingfield 1 land system, 1-3% slope.	Deep, black and brown, cracking and non cracking clays with self mulching to hardsetting surfaces; light clay A horizons; medium clay B horizons; alkaline soil reaction trend. Black and Brown Vertosols and Dermosols.	Eucalypt woodland. Poplar box and silver-leaved ironbark, occasionally with wilga.	III m3, pm2, sa3, e2

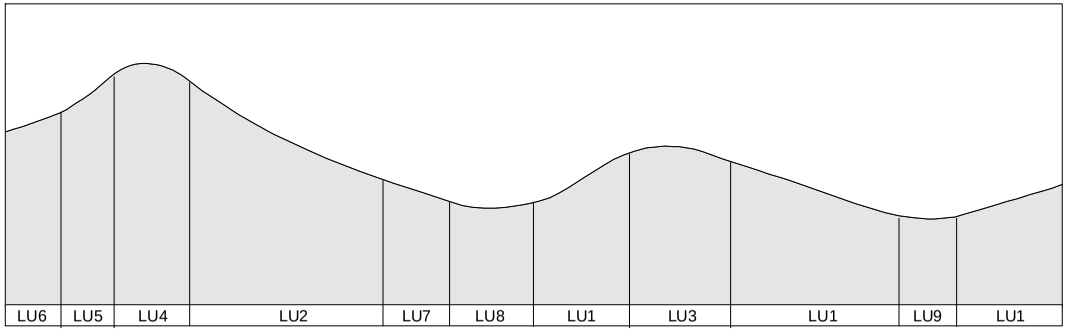
LAND SYSTEM - NOGO 2 (Ng2)

General Description: Undulating rises to undulating low hills on intermediate to basic volcanic rocks. Major soils are moderately deep to deep, black, brown and grey, cracking clays and shallow to moderately deep, red and brown, non cracking clays, gradational soils and sodic duplex soils (Vertosols, Dermosols and Chromosols).

Geology: Nogo Beds - Intermediate to basic volcanics with minor arenite, slate, chert and conglomerate.

Landform: Undulating rises to undulating low hills.

Vegetation: Eucalypt woodland to open woodland, extensively to completely cleared. Silver-leaved ironbark, narrow-leaved ironbark, poplar box, Moreton Bay ash, Queensland blue gum and pink bloodwood.



Land Unit	Area%	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	35	Mid and lower slopes, 3-6%. Linear gilgai.	Deep, black, brown and grey, cracking clays with self mulching surfaces; light medium to medium clay A horizons; medium to heavy clay B horizons; alkaline soil reaction trend. Black, Grey and Brown Vertosols.	Eucalypt woodland to open woodland. Silver-leaved ironbark, Queensland blue gum, Moreton Bay ash and poplar box.	III m3, pm3, tm3, e2-3
LU2	15	Mid slopes, 2-8%. Linear gilgai may be present.	Moderately deep to deep, black, grey and brown, cracking clays (occasionally duplex soils) with self mulching or hardsetting surfaces; light to light medium clay A horizons (occasionally clay loam); medium to heavy clay B horizons; alkaline soil reaction trend. Black, Grey and Brown Vertosols.	Eucalypt woodland to open woodland. Silver-leaved ironbark, poplar box with minor Moreton Bay ash and narrow-leaved ironbark.	III m3, pm3, (tm2), e2-3
LU3	15	Broad crests and upper slopes, 1-4%. Rock outcrop or surface stone may be present.	Moderately deep to deep, red and brown, non cracking and cracking clays and gradational soils with hardsetting surfaces; clay loam to light clay, medium A horizons; medium to heavy clay B horizons; neutral to alkaline soil reaction trend. Red and Brown Dermosols and Vertosols.	Eucalypt woodland to open forest. Silver-leaved ironbark and pink bloodwood.	III-IV m3-4, ps2-3, (r2-3), e2
LU4	10	Higher ridge crests, 1-4% and upper slopes, 6-10%. Stone and rock outcrop common.	Shallow to moderately deep, red and brown, sodic duplex soils, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay (often gravelly), medium A horizons; light to medium clay B horizons, acid to neutral soil reaction trend. Red and Brown Chromosols and Dermosols.	Eucalypt open forest to woodland. Narrow-leaved ironbark, silver-leaved ironbark, pink bloodwood, red ash and wattles.	IV and VI m4 or 6, pd2-3, ps2-3, r3-4, e2-3

NOGO 2 (continued)

Land Unit	Area%	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU5	<5	Mid and upper slopes, 6-12%.	Moderately deep to deep, red and brown, gradational and sodic duplex soils with hardsetting surfaces; loam to clay loam, medium A horizons; light to medium clay B horizons; neutral soil reaction trend. Red and Brown Dermosols and Chromosols.	Eucalypt woodland. Silver-leaved ironbark and Queensland blue gum.	IV m4, ps3, e3-4
LU6	<5	Lower slopes, 1-4%.	Moderately deep, brown, sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium A horizons, with bleached A2 horizons; medium clay B horizons; alkaline soil reaction trend. Brown and Yellow Sodosols.	Eucalypt woodland. Narrow-leaved ironbark, silver-leaved ironbark gum topped box and Queensland blue gum.	VI m6, pd3, ps3, sa3, e4
LU7	5	Mid and lower slopes, 1-4%.	Deep, brown and red, sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium A horizons, with bleached A2 horizons; medium to heavy clay B horizons; alkaline soil reaction trend. Brown and Red Sodosols.	Eucalypt woodland. Poplar box and silver-leaved ironbark.	VI m6, pd3-4, ps3, sa3, e4
LU8	5	Lower slopes and broad drainage lines, 1-3% slope.	Deep, black, brown and grey, sodic duplex soils with hardsetting surfaces; clay loam, medium A horizons, with bleached A2 horizons; medium to heavy clay B horizons; buried soils or D horizons may be present. Black, Brown and Grey Sodosols.	Eucalypt woodland. Poplar box, Moreton Bay ash and Queensland blue gum.	IV m6, pd3-4, ps3, sa3, e2
LU9	10	Lower slopes and drainage depressions, 1-4% slope.	Deep, black and grey, cracking clays with self mulching surfaces; light to medium clay A horizons; medium to heavy clay B horizons; alkaline soil reaction trend. Black and Grey Vertosols.	Eucalypt open woodland. Moreton Bay ash, poplar box, silver-leaved ironbark, Queensland blue gum, gum topped box and apple trees.	III m3, pm3, e3

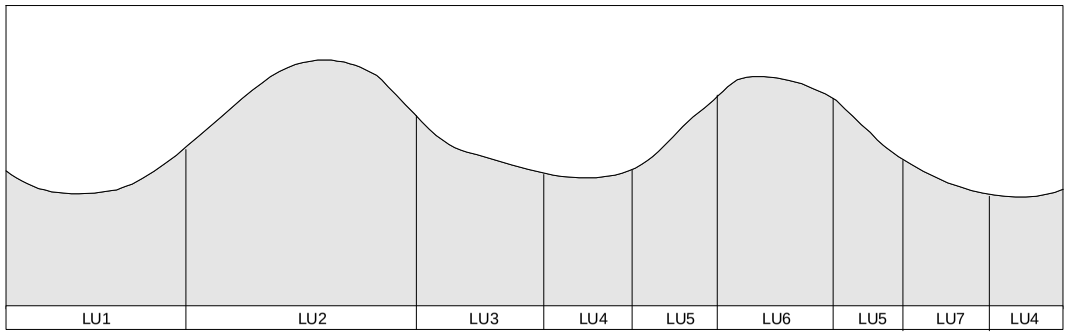
LAND SYSTEM - WATERANGA 1 (Wg1)

General Description: Undulating rises to undulating low hills on basic intrusive rocks. Major soils are shallow to deep, brown and black, non cracking and cracking clays (Dermosols and Vertosols).

Geology: Wateranga Gabbro - Layered olivine gabbro, norite, anorthosite, minor granite.

Landform: Undulating rises to undulating low hills.

Vegetation: Eucalypt woodland, extensively to completely cleared. Silver-leaved ironbark, narrow-leaved ironbark, bloodwoods, Queensland blue gum and Moreton Bay ash.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	15	Lower and mid slopes, 5-10%. Minor rock outcrop.	Shallow to deep, brown, non cracking clays with hardsetting surfaces; light clay, thin to medium A horizons; light medium clay B horizons with occasional rock fragments; alkaline soil reaction trend. Brown Dermosols.	Eucalypt woodland. Narrow-leaved ironbark and Moreton Bay ash.	III-IV m3-4, pd1-3, ps3, r2-3, e3
LU2	15	Crests, upper and mid slopes, 5-10%.	Shallow, brown, non cracking clays with hardsetting surfaces; fine sandy light clay to light clay, medium A horizons; fine sandy light clay to medium clay B horizons; neutral to alkaline soil reaction trend. Black and Brown Dermosols.	Eucalypt woodland. Narrow-leaved ironbark, bloodwoods and species.	IV m4, pd2-3, ps3, e3
LU3	20	Midslopes, 5-10%.	Moderately deep, black and brown, non cracking clays with hardsetting surfaces; fine sandy light clay to light clay, thin to medium, A horizons; fine sandy light clay to medium clay B horizons; neutral to alkaline soil reaction trend. Black and Brown Dermosols.	Eucalypt woodland. Silver-leaved ironbark, bloodwoods and narrow-leaved ironbark.	III m3, ps3, e3
LU4	10	Broad drainage depressions, 1-4% slope.	Deep, black, cracking clays with self mulching surfaces; light to medium clay A horizons; medium clay B horizons; alkaline soil reaction trend. Black Vertosols .	Eucalypt open woodland. Queensland blue gum and silver-leaved ironbark.	II-III m2, pm2-3, e2

WATERANGA 1 (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU5	15	Midslopes, 5-10%. Rock outcrop common.	Shallow, black, cracking clays with hardsetting to self mulching surfaces; light to medium clay A horizons; medium clay B horizons; neutral to alkaline soil reaction trend. Black Vertosols.	Eucalypt woodland. Narrow-leaved ironbark, Queensland blue gum, gum topped bloodwood, silver-leaved ironbark and Moreton Bay ash.	III-IV m3-4, pd2-3, pm2-3, r3-4, e3
LU6	15	Crests and upper slopes, 3-5%. Rock outcrop may be present.	Shallow to moderately deep, black, non cracking and cracking clays with hardsetting to self mulching surfaces; light clay to light medium clay A horizons; light medium clay B horizons; neutral to alkaline soil reaction trend. Black Dermosols and Vertosols.	Eucalypt open forest. Gum topped bloodwood, silver-leaved ironbark and narrow-leaved ironbark.	III-IV m3-4, pd2-3, pm2-3, r2-4, e2-3
LU7	10	Mid to lower slopes, 3-6%. Linear gilgai may be present.	Deep, black and brown, cracking clays with self mulching surfaces; medium clay A horizons; medium clay B horizons; alkaline soil reactrion trend. Black and Brown Vertosols.	Eucalypt woodland to open woodland. Queensland blue gum, gum topped bloodwood and silver-leaved ironbark.	III m2-3, pm3, tm2, e2-3

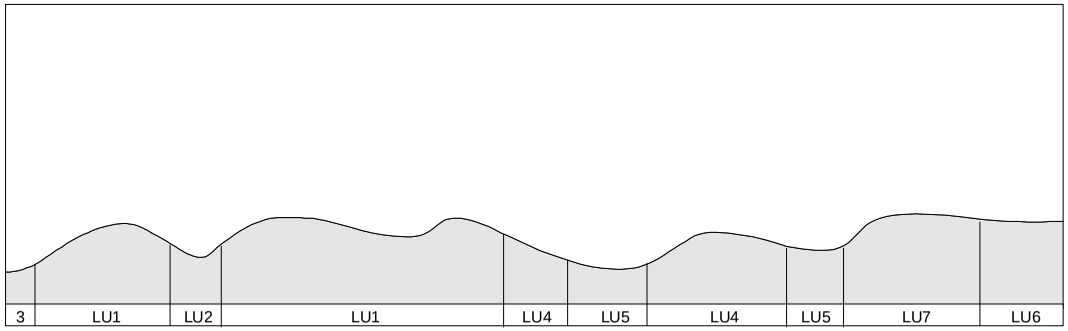
LAND SYSTEM - DELUBRA 2 (Db2)

General Description: Undulating low hills on basic intrusive rocks. Major soils are moderately deep to deep, red, gradational soils, non cracking clays, and non sodic duplex soils and black, brown and red, cracking clays (Dermosols, Chromosols and Vertosols).

Geology: Delubra Quartz Gabbro.

Landform: Undulating low hills.

Vegetation: Eucalypt woodland with minor eucalypt shrubby woodland, usually extensively cleared. Silver-leaved ironbark, gum topped bloodwood, narrow-leaved ironbark, poplar box, minor wilga, false sandalwood and "softwood scrub" species.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	40	Broad undulating ridges, crests and upper to mid slopes, 4-8%. Surface rock may be present.	Moderately deep to deep, red and brown, gradational soils, non cracking clays and non sodic duplex soils; sandy clay loam to light clay, medium A horizons; light clay to light medium clay B horizons; neutral to alkaline soil reaction trend. Red and Brown Dermosols and Chromosols.	Eucalypt woodland. Silver-leaved ironbark, pink bloodwood and narrow-leaved ironbark.	III-IV m3-4, ps3, nd2, r2-3, e3
LU2	10	Lower slopes and drainage lines, 3-10%.	Deep, red, non sodic duplex soils and non cracking clays with hardsetting surfaces; loam to light clay, medium to thick A horizons; light to light medium clay B horizons; alkaline soil reaction trend. Red Chromosols and Dermosols.	Eucalypt woodland. Silver-leaved ironbark, gum topped bloodwood and bottle trees.	VI m3-4, ps3, nd2, e6
LU3	5	Lower slopes and major drainage lines, 1-4% slope.	Deep, brown, non cracking clays and gradational soils with hardsetting surfaces; clay loam to light clay, medium A horizons; light to medium clay B horizons; alkaline soil reaction trend. Brown Dermosols.	Eucalypt open woodland. Poplar box and Queensland blue gum.	VI m3-4, ps3, nd2, e6
LU4	20	Broad ridges and slopes, 2-6%. Linear gilgai. Surface rock may be present.	Deep, black, brown and red, cracking clays with self mulching surfaces; light clay to light medium clay A horizons with carbonate to surface on mounds; medium clay B horizons; coarse fragments may be present throughout profile; alkaline soil reaction trend. Black, Brown and Red Vertosols.	Eucalypt woodland to open woodland. Silver-leaved ironbark and gum topped bloodwood.	III m3, pm3, nd2, r2-3, tm2, e2-3

DELUBRA 2 (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU5	15	Lower concave slopes and drainage lines, 2-6% slope. Normal gilgai or linear gilgai present.	Deep, black, cracking clays with self mulching surfaces; light to medium clay A horizons; medium clay B horizons; alkaline soil reaction trend. Black Vertosols.	Eucalypt open woodland. Silver-leaved ironbark and gum topped bloodwood.	III m3, pm2, nd2, tm2, e3
LU6	5	Broad ridges, 1-3% slope.	Moderately deep to deep, red and brown, non cracking (occasionally cracking) clays with hardsetting to self mulching surfaces; light clay, medium A horizons; medium clay B horizons; alkaline soil reaction trend. Red and Brown Dermosols (occasionally Vertosols).	Eucalypt shrubby woodland. Poplar box, wilga, sandalwood and “softwood scrub” species.	IV m4, ps3, nd2, e3
LU7	5	Crests and upper slopes, 1-5%. Rock outcrop may be present.	Shallow to moderately deep, red, gradational and non sodic duplex soils with hardsetting surfaces; clay loam, medium A horizons with quartz stone; light to medium clay B horizons with gravel; neutral to alkaline soil reaction trend. Red Chromosols and Dermosols.	Eucalypt woodland to open woodland. Gum topped bloodwood and silver-leaved ironbark.	IV m4, pd2-3, nd2, ps3, r3-4, e2-3

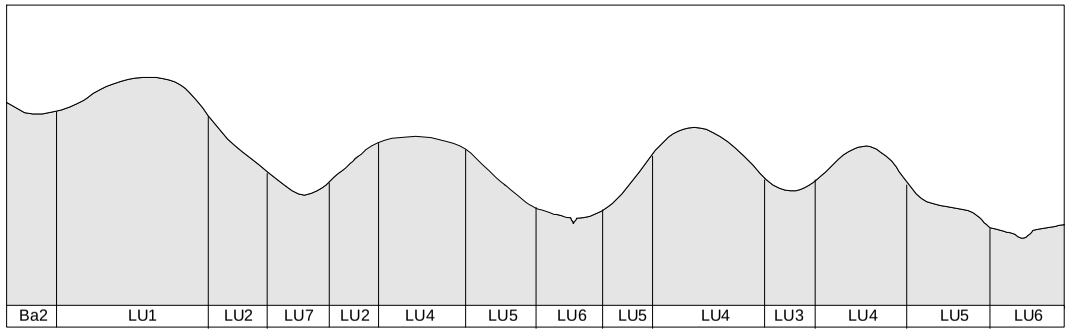
LAND SYSTEM - GREENBANK (Gb)

General Description: Undulating low hills to rolling low hills on basic intrusive rocks. Major soils are shallow to moderately deep, red and brown, non sodic and sodic duplex soils and brown and black, gradational soils and non cracking clays (Chromosols and Dermosols).

Geology: Greenbank Quartz Diorite - Biotite-hornblende quartz diorite, biotite-pyroxene quartz diorite.

Landform: Undulating low hills to rolling low hills.

Vegetation: Eucalypt woodland, usually extensively cleared. Major species include narrow-leaved ironbark, gum topped bloodwood, silver-leaved ironbark with Queensland blue gum and apple trees often on lower slopes.



Note: Bania 2 is also found within this land system

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	15	Crests and upper slopes, 10-20%. Rock outcrop common to abundant.	Shallow to moderately deep, red, duplex soils with hardsetting surfaces; clay loam, medium A horizons; medium clay B horizons; neutral soil reaction trend. Red Chromosols.	Eucalypt woodland. Narrow-leaved ironbark and gum topped bloodwood.	VI-VII m4 or 6, pd2-3, ps3, ts4 or 6, r4-5, e3-4
LU2	15	Midslopes, 15-30%. Rock outcrop common.	Shallow to moderately deep, red, non sodic duplex soils with hardsetting surfaces; clay loam, medium A horizons; medium clay B horizons, neutral soil reaction trend. Red Chromosols.	Eucalypt woodland. Narrow-leaved ironbark and gum topped bloodwood.	VI-VII m4 or 6, pd2-3, ps3, ts6-7, r2-4, e6
LU3	10	Lower concave slopes, 5-15%.	Moderately deep to deep, brown and black, sodic duplex soils and non cracking clays (occasionally cracking clays) with hardsetting surfaces; clay loam to light clay, medium A horizons, usually with bleached A2 horizons; light to medium clay B horizons; alkaline soil reaction trend. Brown and Black Sodosols, Chromosols and Dermosols (occasionally Vertosols).	Eucalypt woodland. Queensland blue gum, narrow-leaved ironbark, gum-topped bloodwood and apple trees.	IV and VI m3-6, ps3, sa2-3, ts4, e4 or 6
LU4	25	Crests and upper slopes, 5-15%. Rock outcrop may occur.	Shallow to moderately deep, red, sodic and non sodic duplex soils with hardsetting surfaces; clay loam, medium A horizons; medium clay B horizons; neutral soil reaction trend. Red Chromosols.	Eucalypt woodland. Narrow-leaved ironbark and gum topped bloodwood.	IV and VI m4-5, pd2-3, ps3, (r4-5), e3-4

GREENBANK (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU5	25	Midslopes, 10-15%. Some rock outcrop may occur.	Shallow to moderately deep, brown and red, non sodic duplex soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons; medium clay B horizons; neutral soil reaction trend. Brown and Red Chromosols and Dermosols..	Eucalypt woodland. Silver-leaved ironbark, narrow-leaved ironbark, gum topped bloodwood and Queensland blue gum.	IV and VI m3-4, pd2-3, ps3, (r3-4), e4
LU6	5	Lower slopes and drainage depressions, 2-6%.	Deep, black, grey and brown (sometimes mottled), gradational soils and non cracking clays and minor cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons, sometimes with bleached A2 horizons; light to medium clay B horizons or D horizons; alkaline soil reaction trend. Black, Grey and Brown Dermosols (minor Vertosols).	Eucalypt woodland. Queensland blue gum, apple trees, silver-leaved ironbark and narrow-leaved ironbark. River oaks and *Melaleuca* species fringe drainage lines.	IV and VI m3-4, pd2-3, ps3, e4
LU7	5	Steep concave lower slopes, 10-15%. Rock outcrop may occur.	Shallow to moderately deep, brown and black, sodic duplex and gradational soils with hardsetting surfaces; clay loam, medium A horizons, sometimes with bleached A2 horizons; light to medium clay B horizons; neutral to alkaline soil reaction trend. Brown and Black Chromosols and Dermosols.	Eucalypt woodland. Narrow-leaved ironbark and bloodwoods.	VI m4 or 6, pd2-3, ps3, ts6, r2-4, e6

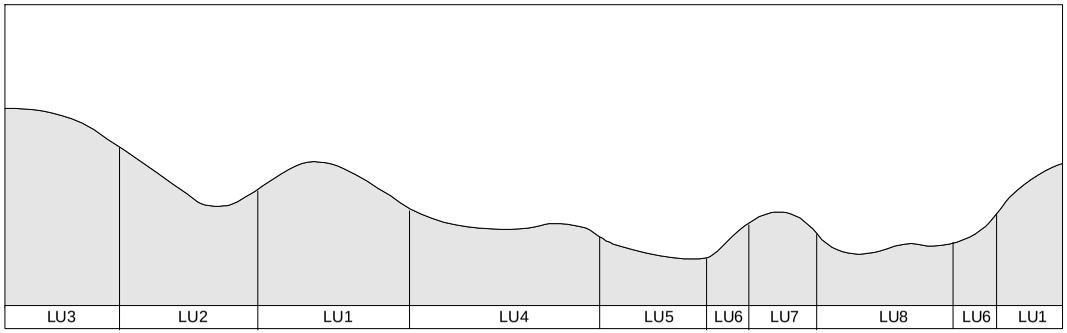
LAND SYSTEM - HINDMARSH 3 (Hm3)

General Description: Undulating low hills to rolling low hills on deeply weathered and fresh basalt. Major soils are deep, red, gradational soils and non cracking clays and shallow to moderately deep, brown and black, non cracking and cracking clays (Ferrosols, Dermosols and Vertosols).

Geology: Tertiary basalt.

Landform: Undulating low hills to rolling low hills on a plateau.

Vegetation: Eucalypt woodland with minor rainforest with limited clearing with some areas completely cleared with an established hoop pine plantation. Silver-leaved ironbark, spotted gum, narrow-leaved ironbark, bloodwoods, Queensland blue gum, crows ash and rainforest species.



Land Unit	Area%	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	20	Crests and upper slopes, 3-8%.	Deep, red, gradational soils and non cracking clays with loose to firm surfaces; clay loam to light clay, medium A horizons; light to medium clay B horizons; acid to neutral soil reaction trend. Red Ferrosols.	Eucalypt forest. Pink bloodwood, with some Queensland blue gum and *Casuarina* species.	III m3, ps3, e2-3
LU2	10	Upper, mid and lower slopes, 8-30%. Few to abundant, medium pebbles and stone may occur.	Moderately deep to deep, often mottled, brown, gradational and non sodic duplex soils with hardsetting surfaces; clay loam, medium A horizons; light to medium clay B horizons; acid soil reaction trend. Brown Ferrosols and Chromosols.	Unknown. Hoop pine plantation.	VI-VII m3-4, ps3, ts6-7, r3-4, e4 or 6
LU3	15	Crests and upper slopes, 3-10%.	Moderately deep to deep, red, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium to thick A horizons; medium clay B horizons; acid soil reaction trend. Red Ferrosols.	Closed forest. Crows ash, hoop pine, other rainforest trees and "scrub" species.	III-IV m3-4, ps3, e2-3
LU4	15	Ridges, upper and mid slopes, 5-10%. Rock outcrop and surface stone usually present.	Shallow to moderately deep, brown and black, gradational soils and non cracking clays with loose to hardsetting surfaces; clay loam to light clay, medium A horizons; medium clay B horizons; acid to neutral soil reaction trend. Black and Brown Dermosols.	Eucalypt woodland. Spotted gum, narrow-leaved ironbark and Queensland blue gum.	IV or VI m3-4 or 6, pd2-3, ps3, r3-4, e3-4

HINDMARSH 3 (continued)

Land Unit	Area%	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU5	10	Mid to lower slopes, 5-8%.	Shallow to moderately deep, black and brown, cracking and non cracking clays with self mulching to hardsetting surfaces; light clay, medium A horizons; medium clay B horizons; acid to neutral soil reaction trend. Black and Brown Vertosols and Dermosols.	Eucalypt woodland. Queensland blue gum and spotted gum.	III-IV m3-4, pd2-3, pm3, e2-3
LU6	5	Steep upper slopes, 12-30%. Rock outcrop and surface stone common.	Shallow, brown and black, gradational soils and non cracking and cracking clays with self mulching to hardsetting surfaces; clay loam to light clay medium A horizons; light clay B horizons; acid to neutral soil reaction trend. Brown and Black Dermosols.	Eucalypt woodland. Silver-leaved ironbark, narrow-leaved ironbark, bloodwoods and wattles.	VI-VII m4, pd3-4, ps3, ts6-7, r4-5, e6
LU7	5	Crests, 3-5%. Rock outcrop and surface stone common.	Very shallow to shallow, black and brown, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay A horizons; light clay B horizons; acid to neutral soil reaction trend. Black and Brown Dermosols.	Eucalypt woodland. Narrow-leaved ironbark, spotted gum and silver-leaved ironbark.	IV or V m4 or 6, pd4 or 6, ps3, r3-5, e4
LU8	20	Ridges, mid and upper slopes, 3-8%. Surface stone often present.	Shallow to moderately deep, black, cracking and non cracking clays with hardsetting to self mulching surfaces; light clay, medium A horizons; medium clay B horizons; neutral soil reaction trend. Black Vertosols and Dermosols.	Eucalypt woodland. Silver-leaved ironbark, narrow-leaved ironbark and bloodwoods.	III-IV m3-4, pd2-3, pm2-3, r2-3, e2-3

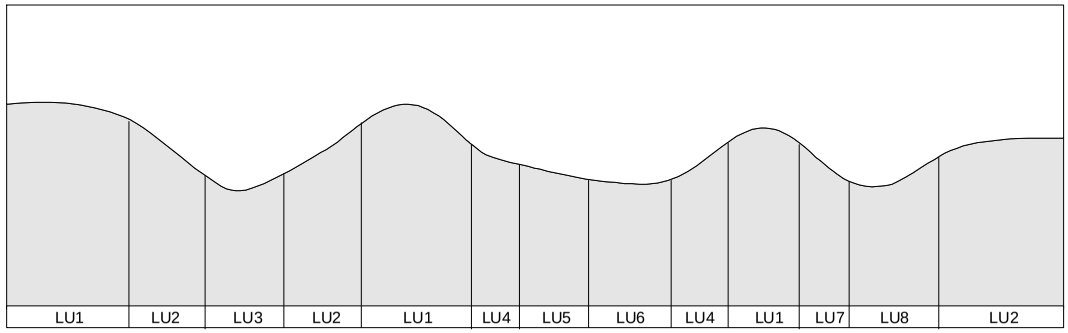
LAND SYSTEM - OWLGULLY 1 (Og1)

General Description: Undulating low hills to rolling low hills on intermediate extrusive rocks. Major soils are shallow to moderately deep, red, non sodic duplex and gradational soils and moderately deep to deep, black, cracking and non cracking clays and yellow and brown, sodic and non sodic duplex soils (Chromosols, Dermosols, Vertosols and Sodosols).

Geology: Owl Gully Volcanics - andesitic lava, tuff, siltstone, lithic arenite.

Landform: Undulating low hills to rolling low hills.

Vegetation: Eucalypt open forest to woodland, limited to extensive clearing. Narrow-leaved ironbark, silver-leaved ironbark, bloodwoods and Queensland blue gum.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	35	Crests and upper slopes, 15-25%. Few to common surface stone. Rock outcrop common.	Shallow, red, non sodic duplex and gradational soils with hardsetting surfaces; clay loam, medium A horizons; light to medium clay B horizons with rock fragments; acid to neutral soil reaction trend. Red Chromosols and Dermosols.	Eucalypt open forest to woodland. Narrow-leaved ironbark and bloodwoods.	VI-VII m6, pd3-4, ts6-7, r2-5, e6
LU2	25	Ridges and midslopes, 10-15%. Surface stone and rock outcrop may occur.	Shallow to moderately deep, red, gradational soils, non cracking clays and non sodic duplex soils with hardsetting surfaces; clay loam to light clay, medium A horizons; light to medium clay B horizons with some rock fragments; neutral soil reaction trend. Red Dermosols and Chromosols.	Eucalypt open forest to woodland. Silver-leaved ironbark, narrow-leaved ironbark and brown bloodwood.	VI m4 or 6, pd2-4, ps3, ts4, r2-4, e4
LU3	5	Lower concave slopes, 5-10%.	Deep, brown and black, non cracking clays (occasionally cracking) with hardsetting surfaces; clay loam to light clay, medium A horizons; light to medium clay B horizons; alkaline soil reaction trend. Brown and Black Dermosols (occasionally Black Vertosols).	Eucalypt woodland. Silver-leaved ironbark, Queensland blue gum and Moreton Bay ash.	IV or VI m3, ps3, e4 or 6
LU4	10	Mid and upper slopes, 5-10%.	Moderately deep to deep, black, cracking and non cracking clays with hardsetting or weakly self mulching surfaces; light clay A horizons; light to medium clay B horizons; alkaline soil reaction trend. Black Vertosols and Dermosols.	Eucalypt woodland. Silver-leaved ironbark.	III m3, ps3, pm2, e2-3

OWLGULLY 1 (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU5	5	Mid and lower slopes, 2-5%. Linear gilai.	Deep, black, cracking clays with self mulching surfaces; light to medium clay A horizons; medium to heavy clay B horizons; alkaline soil reaction trend. Black Vertosols.	Eucalypt woodland. Queensland blue gum and apple trees.	III m3, pm2-3, tm2, e2
LU6	10	Broad drainage depressions, 1-2% slope.	Deep, black, cracking clays and non cracking clays with hardsetting to self mulching surfaces; light to light medium clay A horizons; medium clay B horizons; coarse fragments may be present throughout profile; alkaline soil reaction trend. Black Vertosols and Dermosols.	Eucalypt open woodland. Apple trees and Queensland blue gum.	III m3, pm2-3, e2-3
LU7	5	Midslopes, 10-20%.	Moderately deep to deep, brown and yellow, sodic duplex soils with hardsetting surfaces; loam to clay loam, medium A horizons, usually with bleached A2 horizons; medium clay B horizons, often rock fragments throughout; alkaline soil reaction trend. Brown and Yellow Chromosols.	Eucalypt woodland. Silver-leaved ironbark and gum topped bloodwood occasionally with wattles.	VI m4, pd3-4, ps3, pm2, ts4 or 6, e4 or 6
LU8	5	Lower concave slopes, 5-10%.	Deep, brown, sodic duplex soils with hardsetting surfaces; loam to clay loam, medium to thick A horizons, with bleached A2 horizons; medium clay B horizons; neutral to alkaline soil reaction trend. Brown Chromosols and Sodosols.	Eucalypt woodland. Queensland blue gum and silver-leaved ironbark.	VI m4 or 6, pd3-4, ps3, e4 or 6

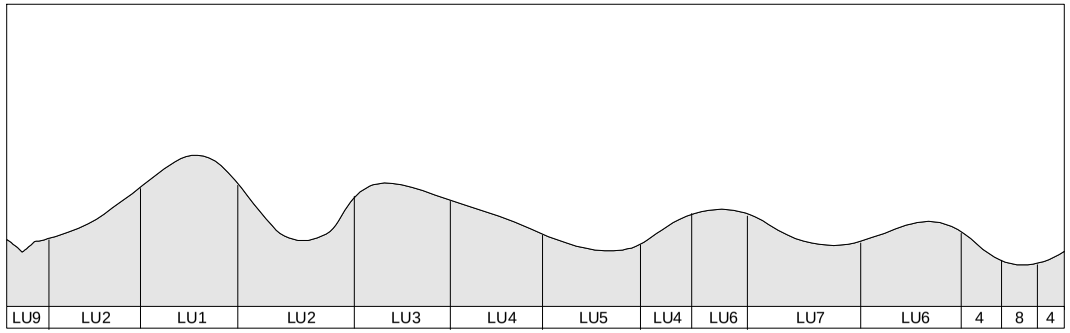
LAND SYSTEM - NOGO 3 (Ng3)

General Description: Undulating low hills to rolling low hills on intermediate to basic volcanic rocks. Major soils are shallow to moderately deep, red and brown, non sodic duplex soils, gradational soils and non cracking clays and black and brown, cracking clays, shallow, uniform, medium textured soils over rock (Chromosols, Dermosols, Vertosols and Tenosols).

Geology: Nogo Beds - Intermediate to basic volcanics, minor arenite, slate, chert, conglomerate.

Landform: Undulating low hills to rolling low hills.

Vegetation: Eucalypt open forest to woodland, limited to extensive clearing. Narrow-leaved ironbark, silver-leaved ironbark, Moreton Bay ash, poplar box and bloodwoods.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	20	Hill crests and upper slopes, 15-25%. Rock outcrop and surface stone common.	Very shallow to shallow, gravelly, uniform, medium textured soils over rock and red and brown, non sodic duplex and gradational soils with hardsetting surfaces; clay loam to light clay, medium A horizons; (when present) light to medium clay B horizons, with gravel and stone; neutral soil reaction trend. Leptic Tenosols and Red and Brown Chromosols and Dermosols.	Eucalypt open forest to woodland. Narrow-leaved ironbark and bloodwoods.	VI m6, pd4 or 6, ps3, ts6, r3-4, e6
LU2	20	Mid and lower slopes, 10-20%. Rock outcrop common, often stone and gravel on surface.	Shallow to moderately deep, red and brown, non sodic duplex and gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons; light clay to medium clay B horizons; often coarse fragments throughout profile; neutral soil reaction trend. Red and Brown Chromosols and Dermosols.	Eucalypt open forest to woodland. Narrow-leaved ironbark, silver-leaved ironbark and bloodwoods.	VI m4 or 6, pd2-4, ps3, ts6, r3-4, e6
LU3	10	Ridge crests, 1-4%, and upper slopes, 6-10%. Stone and rock outcrop common.	Shallow to moderately deep, red and brown, duplex and gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay (often gravelly), medium A horizons; light to medium clay B horizons; neutral to alkaline soil reaction trend. Red and Brown Chromosols and Dermosols.	Eucalypt open forest to woodland. Narrow-leaved ironbark, silver-leaved ironbark with pink bloodwood, red ash and wattle species.	IV m4 or 6, pd2-3, ps3-4, r3-4, e2-3

NOGO 3 (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU4	10	Mid slopes, 4-8%. Surface stone may be present on surface.	Moderately deep to deep, red and brown, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons; light clay to medium clay B horizons; usually fine to medium gravel throughout; neutral to alkaline soil reaction trend. Red and Brown Dermosols.	Eucalypt woodland. Silver-leaved ironbark, Moreton Bay ash and poplar box.	III-IV m3-4, ps2-3, (r2), e2-3
LU5	5	Lower concave slopes, 3-8%.	Moderately deep to deep, brown and black, sodic duplex and gradational soils; clay loam to light clay, medium A horizons, sometimes with bleached A2 horizons; light clay to light medium clay B horizons, often with fine and medium gravel throughout. Brown and Black Chromosols and Dermosols.	Eucalypt woodland to open woodland. Silver-leaved ironbark, Moreton Bay ash and bloodwoods.	III-IV m3-4, pd2-3, ps3, e3-4
LU6	15	Crests and upper slopes, 4-10%. Surface stone often present.	Shallow to moderately deep, black and brown, cracking and non cracking clays with hardsetting to self mulching surfaces; light to medium clay A horizons; medium to heavy clay B horizons; stone and gravel often throughout profile; neutral to alkaline soil reaction trend. Black and Brown Vertosols and Dermosols.	Eucalypt woodland. Silver-leaved ironbark, Moreton Bay ash, bloodwoods and narrow-leaved ironbark.	III-IV m3-4, pd2-3, pm2, r-2-3, e2-3
LU7	15	Mid and lower slopes, 3-8%. Surface stone may be present. Linear gilgai may be present.	Moderately deep to deep, black and brown, cracking clays with self mulching surfaces; light medium to medium clay A horizons; medium to heavy clay B horizons; alkaline soil reaction trend. Black and Brown Vertosols.	Eucalypt woodland. Silver-leaved ironbark and bloodwoods.	III m2-3, pm3, r2, tm2, e2-3
LU8	<5	Lower slopes and broad drainage depressions, 1-3% slope.	Deep, black, brown and grey, sodic duplex soils with hardsetting surfaces; clay loam, medium A horizons, with bleached A2 horizons; medium to heavy clay B horizons; buried soils or D horizons may be present; alkaline soil reaction trend. Black, Brown and Grey Sodosols.	Eucalypt woodland. Poplar box, Moreton Bay ash and Queensland blue gum.	VI m6, pd3, ps3, sa2, e2
LU9	<5	Drainage depressions and channels, 10-20%. Rock outcrop and stone common.	Shallow to deep, alluvial soils with hardsetting surfaces; clay loam to light clay A horizons; sandy clay loam to light clay D horizons; neutral to alkaline soil reaction trend. Leptic Tenosols.	Forest. She oak and melaleuca species.	VII m3-4, ps3-4, ts6, e7, f3

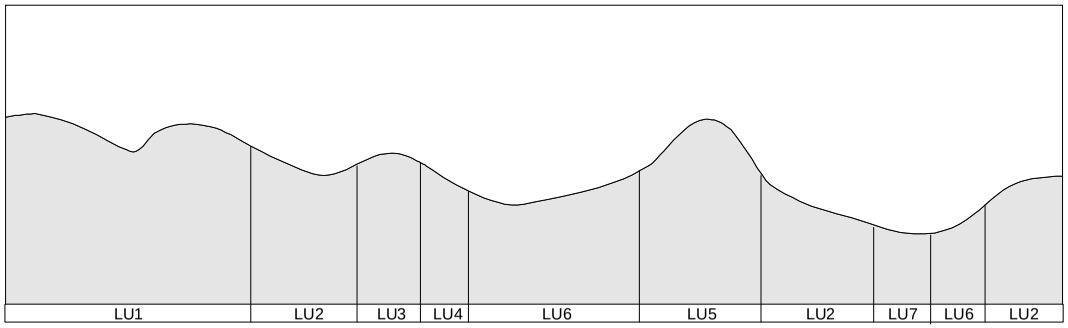
LAND SYSTEM - MUNCON 2 (Mc2)

General Description: Undulating low hills to rolling low hills on intermediate and basic volcanic rocks. Major soils are shallow to deep, red, brown and black, cracking clays and non cracking clays, and shallow to moderately deep, brown and red, non sodic and sodic duplex soils and gradational soils (Vertosols, Dermosols and Chromosols).

Geology: Muncon Volcanics - Intermediate and basic lava, tuff, agglomerate, siltstone, lithic arenite, conglomerate and mudstone.

Landform: Undulating hills to rolling hills.

Vegetation: Eucalypt open forest to woodland,limited to extensive clearing. Narrow-leaved ironbark, silver-leaved ironbark, bloodwoods and Queensland blue gum.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	15	Crests and upper slopes, 10-20%. Rock outcrop common in some areas.	Shallow, brown and red, sodic duplex soils and gradational soils with hardsetting surfaces, clay loam to light clay, medium A horizons; light clay to medium clay B horizons, usually with rock fragments; neutral to alkaline soil reaction trend. Brown and Red Chromosols and Dermosols.	Eucalypt open forest. Spotted gum and narrow-leaved ironbark.	V1 m4 and 6, pd3-4, ts4 and 6, (r3-5), e6
LU2	25	Ridge crests and slopes, 5-15%. Rock outcrop and surface stone may be present.	Shallow to moderately deep, red, brown and black, cracking and non cracking clays with hardsetting to self mulching surfaces; light clay, medium A horizons; light to medium clay B horizons, usually with rock fragments; neutral alkaline soil reaction trend. Red and Black Vertosols and Dermosols.	Eucalypt woodland. Silver-leaved ironbark, bloodwoods, occasionally with narrow-leaved ironbark and Queensland blue gum.	III-IV m3-4, pd3-4, pm2, ts4, r2-4, e3-4
LU3	15	Crests and ridges, 5-10% slope. Rock outcrop common in some areas.	Shallow to moderately deep, brown and red, non sodic duplex and gradational soils with hardsetting surfaces; clay loam, medium A horizons; light to light medium clay B horizons, often with stone fragments; alkaline soil reaction trend. Brown and Red Chromosols and Dermosols.	Eucalypt open forest to woodland. Silver-leaved ironbark and narrow-leaved ironbark.	1V m4, pd3-4, ps3, r2-4, e3

MUNCON 2 (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU4	5	Upper and mid slopes, 10-15%. Surface rock may be present.	Shallow to moderately deep, brown and red, sodic and non sodic duplex soils with hardsetting surfaces; clay loam, medium A horizons; medium clay B horizons; rock fragments may occur throughout profile; neutral to alkaline soil reaction trend. Brown and Red Chromosols.	Eucalypt open forest to woodland. Narrow-leaved ironbark and silver-leaved ironbark.	V1 e4 and 6, pd2-4, ps3, r2-3, e3-4
LU5	15	Crests, ridges and upper slopes, 20-40% slopes. Rock outcrop and surface stone common to abundant.	Shallow, red and brown, non sodic duplex and gradational soils with hardsetting surfaces; clay loam, medium A horizons; light to light medium clay B horizons, usually with rock fragments; neutral to alkaline soil reaction trend. Brown and Red Chromosols and Dermosols.	Eucalypt open forest. Narrow-leaved ironbark, spotted gum and grass trees may be present in some areas.	V11 m6, pd3-4, ps3, ts7, r3-5, e7
LU6	20	Mid and lower slopes, 3-15%. Linear gilgai usually present. Surface stone may be present.	Moderately deep to deep, red and black, cracking and non cracking clays with self mulching to hardsetting surfaces; light clay A horizons; light to medium clay B horizons; alkaline soil reaction trend. Red and Black Vertosols and Dermosols.	Eucalypt woodland. Silver-leaved ironbark, Queensland blue gum and Moreton Bay ash occasionally with rough barked apple.	III-IV m2-3, pm2, r2-3, tm2, e3-4
LU7	5	Lower slopes, 3-5%. Linear gilgai present.	Deep, black and brown, cracking clays usually with hardsetting surfaces; light to medium clay A horizons; medium clay B horizons; alkaline soil reaction trend. Black and Brown Vertosols	Eucalypt woodland to open woodland. Queensland blue gum and rough barked apple.	II-III m2, pm2-3, tm2, e2

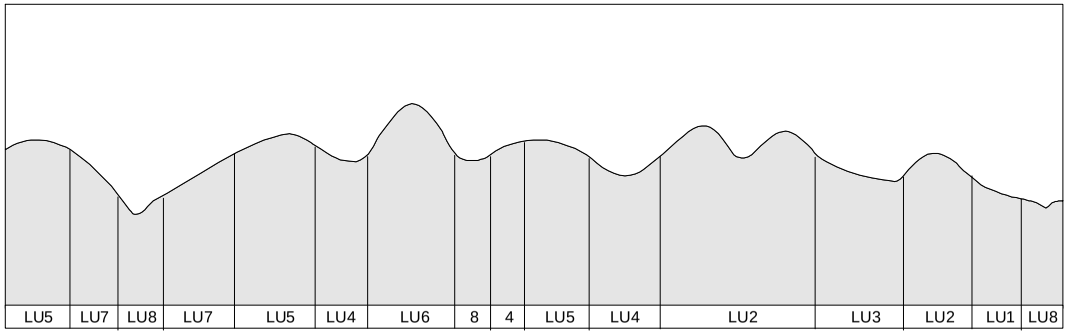
LAND SYSTEM - GOONDICUM (Gc)

General Description: Undulating low hills to rolling low hills on basic intrusive and extrusive rocks. Major soils are moderately deep to deep, red and brown, non cracking clays and gradational soils with shallow to deep, black and brown, cracking clays (Ferrosols and Vertosols).

Geology: Goondicum Gabbro - Gabbro, syenite and basalt.

Landform: Undulating low hills to rolling low hills areas within a rimmed basin.

Vegetation: Eucalypt woodland, limited to completely cleared. Bloodwoods, narrow-leaved ironbark, silver-leaved ironbark, Queensland blue gum and Moreton Bay ash.



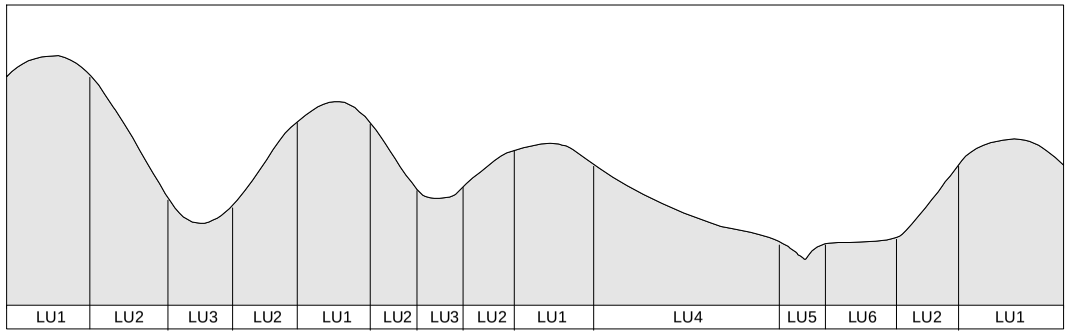
Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	5	Lower slopes, 1-4%. Normal gilgai.	Deep, black, cracking clays with self mulching surfaces; medium clay A horizons; medium to heavy clay B horizons; alkaline soil reaction trend. Black Vertosols.	Eucalypt open woodland. Queensland blue gum, with occasional Moreton Bay ash.	III m2-3, pm3, tm2, e2
LU2	15	Ridges, crests, upper and mid slopes, 10-25%. Rock outcrop and surface coarse fragments abundant.	Shallow to moderately deep, brown and black, non cracking and cracking clays with hard setting to self mulching surfaces; light clay to light medium clay A horizons; medium clay B horizons; neutral to alkaline soil reaction trend. Brown and Black Ferrosols and Vertosols.	Eucalypt woodland. Gum topped bloodwood and narrow-leaved ironbark.	VI m3-4, pd2-3, ps2, r3-4, e6
LU3	15	Mid and lower slopes, 4-10%. Rock outcrop may be present.	Moderately deep to deep, brown and black, cracking clays with self mulching surfaces; light clay to light medium clay A horizons; light to medium clay B horizons; neutral to alkaline soil reaction trend. Brown and Black Vertosols.	Eucalypt woodland. Queensland blue gum.	II-III m2-3, pm2-3, (r3), e2-3
LU4	15	Mid and upper lower slopes, 10-20%. Rock outcrop and stone in patches.	Moderately deep to deep, brown, gradational soils and non cracking clays (occasionally cracking clays) with hardsetting surfaces; clay loam to light clay, medium to thick A horizons; light to medium clay B horizons; neutral to alkaline soil reaction trend. Brown Ferrosols.	Eucalypt woodland. Narrow-leaved ironbark, Queensland blue gum and pink bloodwood.	IV and VI m2-3, pd2-3, (r2-3), e4 or 6

GOONDICUM (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU5	15	Crests 2-6%, and upper slopes, 8-15%.	Shallow to moderately deep, red and brown, non cracking clays and gradational soils with hardsetting surfaces; clay loam to light clay, medium A horizons; light to light medium clay B horizons; neutral soil reaction trend. Red and Brown Ferrosols.	Eucalypt woodland. Gum topped bloodwood, narrow-leaved ironbark, silver-leaved ironbark and Moreton Bay ash.	III-IV m3-4, pd2-3, ps3, e2-4
LU6	5	Upper slopes and crests, 20-30% slopes. Rock outcrop common.	Very shallow to shallow, red and brown, gradational and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons; light clay to light medium clay B horizons; neutral soil reaction trend. Red and Brown Ferrosols.	Eucalypt woodland. Narrow-leaved ironbark, silver-leaved ironbark and gum topped bloodwood.	VI-VII m4 or 6, pd4 or 6, ps3, ts6-7, r3-5, e6
LU7	25	Mid slopes, 8-12%.	Moderately deep to deep, red, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons; light to light medium clay B horizons; neutral soil reaction trend. Red Ferrosols.	Eucalypt woodland to open woodland. Queensland blue gum.	III-IV m3-4, ps3, e3-4
LU8	5	Lower slopes, 8-15%. Drainage depressions and major drainage lines. Abundant stone in major creek lines.	Moderately deep to deep, brown, non cracking clays with hardsetting surfaces (alluvial soils in major creek lines); light clay, medium A horizons; light clay to medium clay B or D horizons; neutral to alkaline soil reaction trend. Brown Dermosols and Leptic Tenosols.	Eucalypt woodland. Queensland blue gum, Moreton Bay ash, silver-leaved ironbark and rusty gum. River oak and *Melaleuca* species common in creek lines.	VI-VII m3-4, ps3, ts6, e6-7, (r5), f2-3

LAND SYSTEM - KARIBOE (Kb)

General Description: Undulating hills to rolling hills primarily on basic volcanic rocks. Major soils are shallow to deep, red and brown, non sodic duplex soils, gradational soils and non cracking clays, brown and yellow, sodic duplex soils and black, cracking clays (Chromosols, Dermosols, Sodosols and Vertosols).
Geology: Kroombit Beds - Andesitic lava, agglomerate, tuff, lithic arenite, siltstone, conglomerate, limestone.
Landform: Rolling hills to undulating hills.
Vegetation: Eucalypt woodland, limited to complete clearing. Narrow-leaved ironbark, bloodwoods, silver-leaved ironbark, Moreton Bay ash and Queensland blue gum.



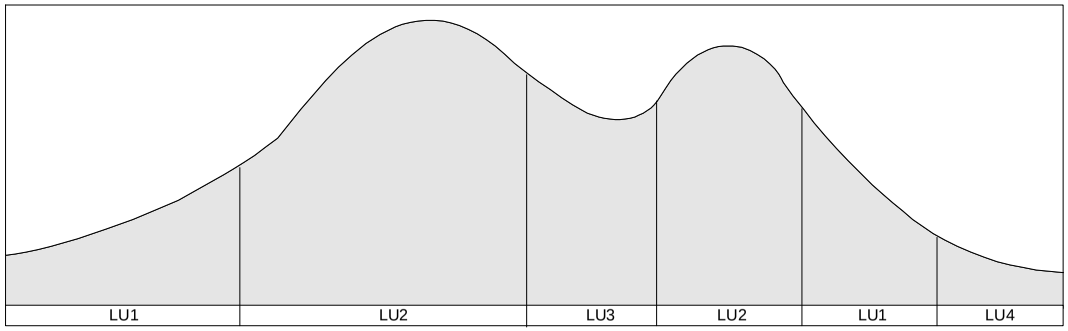
Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	35	Crests, ridges and upper slopes, 5-10%. Usually common, medium to coarse gravel on surface. Rock outcrop may be present.	Shallow, red, non sodic duplex soils and gradational soils with hardsetting surfaces; clay loam, medium A horizons; light to medium clay B horizons; usually common to abundant, fine to medium gravel throughout profile; neutral soil reaction trend. Red Chromosols and Dermosols.	Eucalypt woodland. Bloodwoods, narrow-leaved ironbark and silver-leaved ironbark.	VI m4, pd2-3, ps3, nd2, r4, e6
LU2	25	Midslopes, 15-30%. Medium to coarse gravel may be present on surface.	Shallow to deep, red, non sodic duplex soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons; light to medium clay B horizons; few to common medium gravel may be present throughout profile or at depth; neutral to alkaline soil reaction trend. Red Chromosols and Dermosols.	Eucalypt woodland. Silver-leaved ironbark, narrow-leaved ironbark and Moreton Bay ash.	VI-VII m2-4, pd1-3, nd2, ps3, ts6-7, (r3-4), e6-7
LU3	10	Lower slopes, 5-15%.	Moderately deep to deep, brown and yellow, sodic duplex and gradational soils with hardsetting surfaces; clay loam, medium A horizons; light clay to light medium clay B horizons; few to common, medium gravel may be present throughout profile; neutral to alkaline soil reaction trend. Brown and Yellow Chromosols and Dermosols.	Eucalypt woodland. Queensland blue gum, silver-leaved ironbark and Moreton Bay ash.	VI m3-4, ps3, nd2, ts4, e6

KARIBOE (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU4	15	Mid and lower slopes, 8-12%.	Moderately deep to deep, brown, sodic duplex soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons, often with bleached A2 horizons; medium clay B horizons; alkaline soil reaction trend. Brown Sodosols, Chromosols and Dermosols.	Eucalypt woodland. Silver-leaved ironbark and narrow-leaved ironbark.	IV m3-4, pd2-4, ps3, nd2, e4
LU5	5	Drainage lines, some with steep sides.	Alluvial soils with minor areas of black, cracking clays. Leptic Tenosols and Black Vertosols.	Eucalypt open woodland. Queensland blue gum with Melaleuca species and River she-oaks fringing drainage lines.	VI m3-4, ps3, ts4-6, e6, f2-3
LU6	10	Lower slopes 3-5%. Linear gilgai present. Coarse gravel may be present on surface.	Moderately deep to deep, black, cracking clays with weak self mulching surfaces; light to medium clay A horizons; medium clay B horizons; alkaline soil reaction trend. Black Vertosols.	Eucalypt open woodland. Queensland blue gum.	IV m3-4, pm3, e2

LAND SYSTEM - WATERANGA 2 (Wg2)

General Description: Rolling low hills to steep hills on basic intrusive rocks. Major soils are shallow to deep, red and brown, non cracking clays (Dermosols).
Geology: Wateranga Gabbro - Layered olivine gabbro, norite, anorthosite, minor granite.
Landform: Rolling low hills to steep hills.
Vegetation: Eucalypt open forest, limited to extensively cleared. Narrow-leaved ironbark, gum topped bloodwood, wattles, *Casuarina* species, Moreton Bay ash and grass trees.



Land Unit	Area%	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	30	Mid and lower slopes, 10-25%, dissected by deep drainage lines in lower slopes. Rock outcrop common.	Shallow to moderately deep, red and brown, non cracking clays with hardsetting surfaces; light clay A horizons; fine sandy light clay to light clay B horizons; rock fragments often throughout profile; neutral to alkaline soil reaction trend. Red and Brown Dermosols.	Eucalypt open forest. Narrow-leaved ironbark, gum topped bloodwood, wattles and *Casuarina* species.	VI-VII m4, pd2-3, ts6, r3-5, e6
LU2	40	Crests and upper slopes, 20-60%. Rock outcrop common to abundant.	Shallow to moderately deep, red, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay, thin to medium A horizons; fine sandy light clay to light clay B horizons; rock fragments usually throughout the profile; neutral soil reaction trend. Red Dermosols.	Eucalypt open forest. Narrow-leaved ironbark, gum topped bloodwood, wattles, *Casuarina* species with grass trees often present.	VII-VIII m4, pd2-3, ps3, ts7-8, r4-5, e7-8
LU3	20	Lower slopes and drainage depressions high in the landscape, 10-20% slope. Minor rock outcrop may be present.	Shallow to deep, brown, non cracking and cracking clays with hardsetting surfaces; light clay A horizons; light medium clay B horizons, with occasional rock fragments; alkaline soil reaction trend. Brown Dermosols and Vertosols.	Eucalypt woodland. Narrow-leaved ironbark, Moreton Bay ash and gum topped bloodwood.	VI m3-4, pd1-3, ps3, ts4 or 6, r2-3, e6
LU4	10	Lower slopes, 5-12%.	Shallow to deep, brown, non cracking clays with hardsetting surfaces; light clay A horizons; light medium clay B horizons, with occasional rock fragments; alkaline soil reaction trend. Brown Dermosols.	Eucalypt woodland. Narrow-leaved ironbark and Moreton Bay ash.	III-IV m3-4, pd1-3, ps3, e3-4

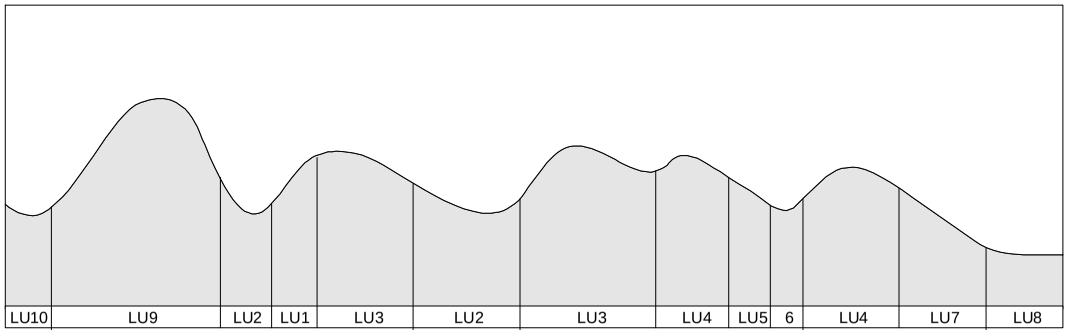
LAND SYSTEM - MUNCON 3 (Mc3)

General Description: Rolling hills to steep hills with some plateau surfaces on intermediate and basic volcanic rocks. Major soils are shallow, uniform, medium and coarse textured soils over rock and shallow to moderately deep, brown and grey, sodic duplex soils and gradational soils and non cracking clays (Rudosols, Chromosols, Sodosols and Dermosols).

Geology: Muncon Volcanics - Intermediate and basic lava, tuff, agglomerate, siltstone, lithic arenite, conglomerate, mudstone.

Landform: Rolling hills to steep hills with some plateau surfaces.

Vegetation: Eucalypt open forest to woodland with minor areas of "softwood scrub" forest with limited clearing. Narrow-leaved ironbark, spotted gum, bloodwoods, gum topped box and Queensland blue gum.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	30	Upper and midslopes, 20-40%. Some as steep as 60%. Rock outcrop and surface stone common to abundant.	Very shallow to shallow, stony, medium and coarse textured soils over rock, and brown and grey, sodic duplex soils with hardsetting surfaces; sandy loam to clay loam, medium A horizons, often with bleached A2 horizons; (when present) clay loam to light medium clay B horizons; pebbles and rock fragments usually throughout profile; acid soil reaction trend. Leptic Rudosols and Brown and Grey Chromosols and Sodosols.	Eucalypt open forest. Spotted gum, narrow-leaved ironbark, grey gum and bloodwoods.	VII-VIII m6, pd4 and 6, ps3, nd3, ts7-8, r3-5, e7
LU2	10	Lower slopes, 5-15%	Moderately deep to deep, often mottled, brown and yellow, sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium to thick A horizons; light to medium clay B horizons; ironstone gravel and cobble often throughout profile; acid soil reaction trend. Brown and Yellow Chromosols.	Eucalypt woodland. Queensland blue gum, narrow-leaved ironbark and bloodwoods.	VI-VII m4, pd3-4, ps3, r3-4, e6
LU3	30	Crests, ridges and upper slopes, 5-15%. Rock outcrop common to abundant in places.	Shallow, medium and coarse textured soils over rock and grey and brown, sodic duplex soils with hardsetting surfaces; sandy loam to clay loam, medium A horizons, often with bleached A2 horizons; (when present) clay loam to light medium clay B horizons; stone and rock fragments usually throughout; acid to neutral soil reaction trend. Leptic Rudosols and Grey and Brown Chromosols and Sodosols.	Eucalypt open forest. Spotted gum, narrow-leaved ironbark, bloodwoods, gum topped box occasionally with "Softwood scrub" species.	VII m6, pd3-4, ps3, nd3, r4-5, e6

MUNCON 3 (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU4	5	Crests and upper slopes, 5-15%. Rock outcrop and surface stone may be present.	Shallow to moderately deep, red, non sodic and sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam medium A horizons, with bleached A2 horizons; light medium clay B horizons; pebbles and rock fragments may be present in some horizons; acid to neutral soil reaction trend. Red Chromosols.	Eucalypt open forest. Narrow-leaved ironbark, gum topped box and red ash.	VI-VII m4, pd3-4, ps3, r3-5, e6
LU5	5	Mid slopes, 10-20%. Rock outcrop and surface stone may be present.	Shallow to moderately deep, red and brown, sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium A horizons, usually with bleached A2 horizons; light to medium clay B horizons; pebbles and rock fragments usually present in profile; acid to neutral soil reaction trend. Red and Brown Chromosols.	Eucalypt woodland. Narrow-leaved ironbark, gum topped box and bloodwoods.	VI-VII m4 or 6, pd2-4, ps3, ts6, r3-5, e6
LU6	5	Lower concave slopes, 5-15%.	Moderately deep to deep, brown and grey, sodic duplex soils with hardsetting surfaces; sandy loam to clay loam, medium A horizons, with bleached A2 horizons; medium clay B horizons; pebbles and stone fragments usually present in profile; neutral to alkaline soil reaction trend. Brown and Grey Sodosols.	Eucalypt woodland. Gum topped box, narrow-leaved ironbark and bloodwoods.	VI m6, pd4, ps3, ts4, r2-3, e6
LU7	5	Midslopes, 8-15%.	Shallow to moderately deep, grey and brown, sodic duplex soils with hardsetting surfaces, sandy clay loam to clay loam, medium A horizons, often with bleached A2 horizons; clay loam to light medium clay B horizons; rock fragments and pebbles usually throughout profile; acid to neutral soil reaction trend. Grey and Brown Chromosols.	Eucalypt open forest. Bloodwoods, narrow-leaved ironbark and gum topped box.	VI m6, pd2-4, ps3, r2-3, e6
LU8	<5	Lower slopes and major drainage lines, 3-8%. Surface stone may be present.	Deep, brown and grey, gradational soils, sodic duplex soils and alluvial soils with hardsetting surfaces; sandy clay loam to clay loam, medium A horizons, often with bleached A2 horizons; light to medium clay B or D horizons; rock fragments and pebbles common throughout profile; neutral to alkaline soil reaction trend. Brown and Grey Dermosols and Sodosols and Leptic Rudosols.	Eucalypt woodland. Queensland blue gum, Moreton Bay ash and rough barked apple. River oak and *Melaleuca* species fringe drainage lines.	VI-VII m3-4, pd2-4, ps3, r3-4, e4
LU9	5	Crests, ridges upper and mid slopes, 15-50%.	Shallow to moderately deep, red, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons; light to medium clay B horizons, usually with rock fragments; neutral to alkaline soil reaction trend. Red Dermosols.	Vine Forest. “Softwood scrub” species.	VI-VIII m3-4, pd2-3, ps3, r2-3, ts6-8, e6-8
LU10	<5	Lower concave slopes, 5-15%.	Moderately deep, red and brown, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons; light to medium clay B horizons, usually with rock fragments; neutral to alkaline soil reaction trend. Red and Brown Dermosols.	Vine forest. “Softwood scrub” species.	VI m3-4, ps3, r2-3, e6

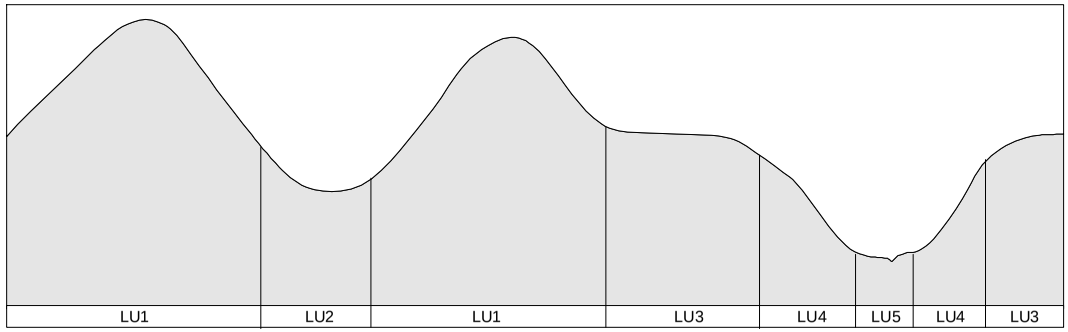
LAND SYSTEM - OWLGULLY 2 (Og2)

General Description: Rolling hills to steep hills on intermediate extrusive volcanic rocks. Major soils are lithosols and shallow to moderately deep, red, non sodic duplex soils, minor sodic duplex soils and cracking clays (Tenosols, Chromosols, Sodosols and Vertosols).

Geology: Owl Gully volcanics - Andesitic lava, tuff, siltstone, lithic arenite.

Landform: Rolling hills to steep hills.

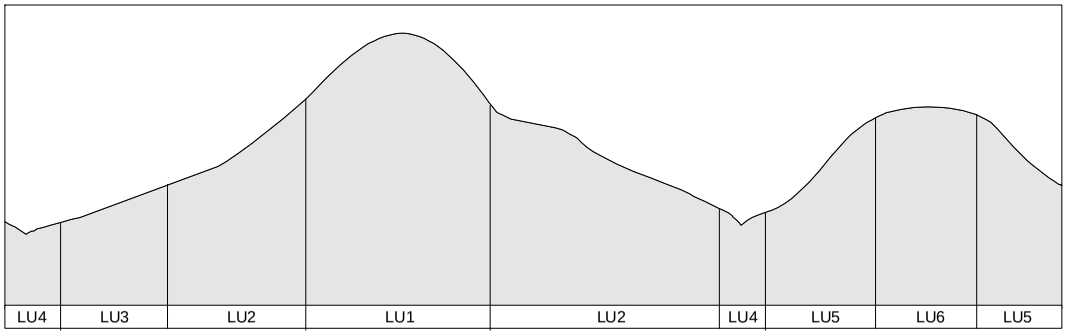
Vegetation: Eucalypt open forest to woodland with limited clearing. Narrow-leaved ironbark, bloodwoods and silver-leaved ironbark.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	50	Crests and slopes, 20-40% slope. Some as high as 60%. Rock outcrop and surface stone common.	Lithosols and shallow, red, non sodic duplex soils with hardsetting surfaces; clay loam medium, A horizons; light to medium clay B horizon (if present), rock fragments and cobble often throughout; acid to neutral soil reaction trend. Leptic Tenosols and Red Chromosols.	Eucalypt open forest. Narrow-leaved ironbark and bloodwoods.	VII-VIII m6, pd4 or 6, ts7-8, r5, e7-8
LU2	20	Lower concave slopes, 8-15%.	Moderately deep, brown, sodic duplex soils with hardsetting surfaces; loam to clay loam, medium A horizons, usually with bleached A2 horizons; medium clay B horizons; rock fragments may be present through profile; neutral to alkaline soil reaction trend. Brown Chromosols.	Eucalypt woodland. Bloodwoods, Queensland Blue gum, Moreton Bay ash with some narrow-leaved ironbark and silver-leaved ironbark.	V1 m4, pd3-4, ps3, ts4, e6
LU3	20	Crests and upper slopes, 15-25%. Few to common surface stone. Rock outcrop common.	Shallow, red, non sodic duplex and gradational soils with hardsetting surfaces; clay loam, medium A horizons; light to medium clay B horizons with rock fragments; acid to neutral soil reaction trend. Red Chromosols and Dermosols.	Eucalypt open forest to woodland. Narrow-leaved ironbark and bloodwoods.	VI-VII m4, pd3-4, ts6-7, r2-5, e6
LU4	5	Mid and upper slopes, 5-15%.	Moderately deep to deep, black, cracking and non cracking clays with hardsetting or weakly self mulching surfaces; light clay A horizons; light to medium clay B horizons; alkaline soil reaction trend. Black Vertosols and Dermosols.	Eucalypt woodland. Silver-leaved ironbark.	III-IV m3, ps3, pm2, e3-4
LU5	5	Broad drainage depressions.	Deep, black, cracking clays and non cracking clays with hardsetting to self mulching surfaces; light clay to light medium clay A horizons; medium clay B horizons; coarse fragments may be present throughout profile; alkaline soil reaction trend. Black Vertosols and Dermosols.	Eucalypt open woodland. Apple trees and Queensland blue gum.	II-III m2-3, pm2-3, e2-3

LAND SYSTEM - HINDMARSH 4 (Hm4)

General Description: Rolling hills to steep hills and residual plateaus on basic volcanic rocks. Major soils are red, gradational soils and non cracking clays with black and brown, non cracking and cracking clays (Ferrosols, Dermosols and Vertosols).
Geology: Tertiary basalt.
Landform: Rolling hills to steep hills and residual plateaus.
Vegetation: Eucalypt open forest to woodland with limited clearing. Narrow-leaved ironbark, silver-leaved ironbark and bloodwoods.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	30	Ridge crests and upper slopes, 30-50%. Rock outcrop and surface stone common to abundant.	Shallow to deep, red, gradational and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons; light to light medium clay B horizons; rock fragments and stone common throughout profile; acid to neutral soil reaction trend. Red Ferrosols.	Eucalypt open forest. Narrow-leaved ironbark, silver-leaved ironbark, bloodwoods, wattles and lantana.	VII-VIII m3-4, pd1-3, ps3, ts7-8, r5, e7-8
LU2	20	Mid and lower slopes, 15-30%. Rock outcrop and surface stone common to abundant.	Moderately deep to deep, red, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons; light to light medium clay B horizons; rock fragments may be present; neutral to alkaline soil reaction trend. Red Ferrosols.	Eucalypt open forest. Narrow-leaved ironbark, silver-leaved ironbark, bloodwoods, wattles, lantana and grass trees.	VI-VII m3-4, ps3, ts6-7, r3-5, e6-7
LU3	15	Lower slopes, 15-25%. Rock outcrop and surface stone may be present.	Moderately deep to deep, brown and yellow, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons; light to light medium clay B horizons; neutral to alkaline soil reaction trend. Brown and Yellow Ferrosols.	Eucalypt open forest. Narrow-leaved ironbark, silver-leaved ironbark and bloodwoods.	VI-VII m2-3, ps3, ts6, r2-5, e6
LU4	5	Lower slopes and drainage lines, 3-6%. Rock outcrop abundant in some areas	Shallow to deep, black, sodic duplex soils and non cracking clays (occasionally cracking clays) with hardsetting surfaces; clay loam to light clay, medium A horizons, occasionally with bleached A2 horizons; medium clay B horizons; alkaline soil reaction trend. Black Sodosols and Dermosols (occasionally Vertosols).	Eucalypt woodland to open woodland. Queensland blue gum and rough barked apple.	VI-VII m3-4, pd2-3, ps3, r2-5, e6-7

HINDMARSH 4 (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU5	15	Mid and upper slopes, 15-20%, some as steep as 30%. Abundant surface stone and rock outcrop.	Shallow, black and brown, non cracking and cracking clays with hardsetting to self mulching surfaces; light clay, medium A horizons; light to medium clay B horizons, with rock fragments and pebbles usually throughout; neutral to alkaline soil reaction trend. Black and Brown Dermosols and Vertosols.	Eucalypt woodland. Narrow-leaved ironbark and silver-leaved ironbark.	VII m4 to 6, pd3-4, ts6-7, r4-5, e6-7
LU6	15	Flat topped crests, 0-2%. Abundant stone on surface.	Shallow, black and brown, non cracking and cracking clays with hardsetting to self mulching surfaces; light clay, medium A horizons; light to medium clay B horizons; rock fragments and pebbles usually throughout; neutral to alkaline soil reaction trend. Black Dermosols and Vertosols.	Eucalypt woodland to open woodland. Narrow-leaved ironbark and silver-leaved ironbark.	VI-VII m4 to 6, pd3-4, r4-5, e2, x6

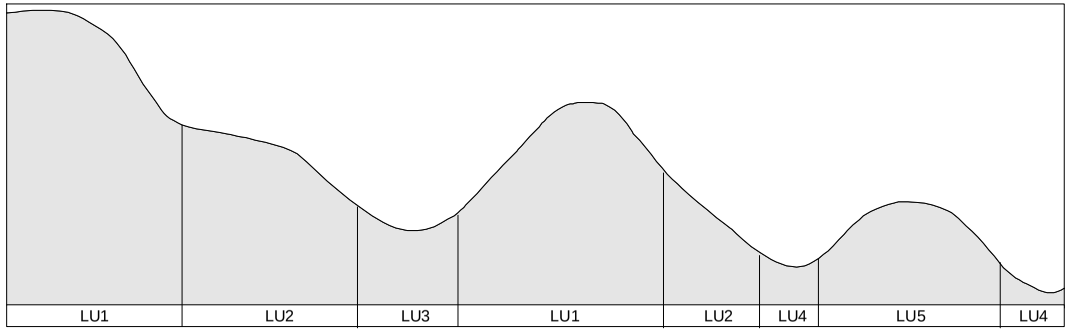
LAND SYSTEM - ARANBANGA 1 (Ab1)

General Description : Rolling hills to steep mountains on acid volcanic rocks. Major soils are shallow to moderately deep, red and brown, non cracking clays and gradational soils (Dermosols).

Geology : Undivided formation of the Aranbanga Volcanic Group - Andesitic to rhyolitic flows and pyroclastics, minor polymictic conglomerate, volcanic breccia.

Landform : Rolling hills to steep mountains with minor rolling low hills.

Vegetation : "Softwood scrub" forest, with limited clearing, minor areas extensively to completely cleared. "Softwood scrub" species and hoop pine, occasionally spotted gum and narrow-leaved ironbark.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	45	Crests and upper slopes 40-60%. Surface stone and rock outcrop common.	Shallow, red, non cracking clays and gradational soils with hardsetting surfaces; clay loam to light clay, medium A horizons; light clay B horizons; acid soil reaction trend. Red Dermosols.	Forest. "Softwood scrub" species, hoop pine often present as emergent.	VIII m6, pd3-4, ps3, nd3, ts8, r4-5, e8
LU2	35	Midslopes 30-50%. Surface stone common. Rock outcrop may be present.	Shallow, red, non cracking clays and gradational soils with hardsetting surfaces; clay loam to light medium, clay, medium A horizons; light to light medium clay B horizons; acid to neutral soil reaction trend. Red Dermosols.	Forest. "Softwood scrub" species and spotted gum.	VIII m6, pd3-4, ps3, nd3, ts7-8, r4-5, e7-8
LU3	10	Lower slopes, 2-10. Surface stone many to abundant.	Shallow to moderately deep, red, non cracking clay with hardsetting surfaces; light clay, medium A horizons; light clay to light medium clay B horizons, often with rock fragments; acid to neutral soil reaction trend. Brown and Red Dermosols.	Forest. "Softwood scrub" species and spotted gum.	1V or VI m4 or 6, pd2-3, ps3, nd3, r3-4, e3-4
LU4	5	Lower slopes, 10-20%. Surface stone common.	Shallow to moderately deep, brown and red, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons; light clay to light medium clay B horizons; coarse fragments throughout profile; neutral soil reaction trend. Brown and Red Dermosols.	Forest. Wattles and "softwood scrub" species.	VI-VII m4 or 6, pd2-3, ps3, nd3, ts6, r4-5, e4 or 6
LU5	5	Crests and slopes, 8-15%. Some surface stone may occur.	Shallow to moderately deep, brown to red, non cracking clays with hardsetting surfaces; light clay, medium A horizons; light to medium clay B horizons; rock fragments usually throughout profile; neutral soil reaction trend. Brown and Red Dermosols.	Forest. "Softwood scrub" species.	III-IV m3-4, pd2-3, ps3, nd3, r2-3, e3-4

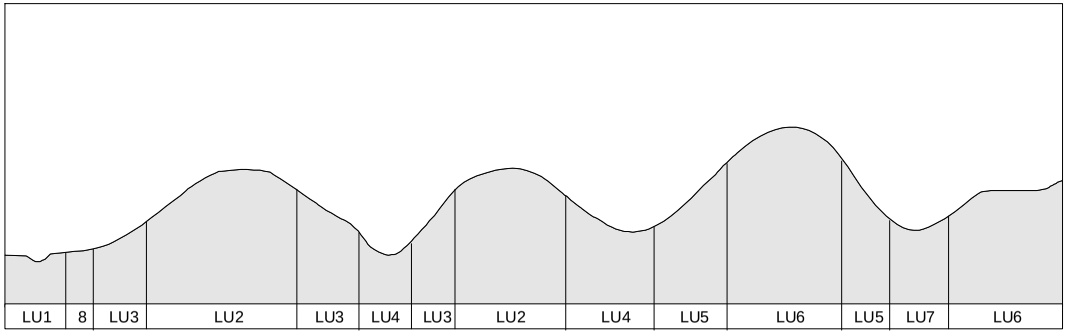
LAND SYSTEM - ARANBANGA 2 (Ab2)

General Description: Undulating low hills to rolling low hills on acid volcanic rocks. Major soils are shallow, black, grey and brown, non cracking clays and shallow to moderately deep, brown and yellow, non sodic duplex soils and shallow to deep, brown and grey, sodic duplex soils (Dermosols, Sodosols and Chromosols).

Geology: Undivided formation of the Aranbanga Volcanic Group - Andesitic to rhyolitic flows and pyroclastics, minor polymictic conglomerate, volcanic breccia.

Landform: Undulating low hills to rolling low hills.

Vegetation: Eucalypt woodland, extensively cleared. Narrow-leaved ironbark, spotted gum, bloodwoods, Queensland blue gum, Moreton Bay ash with patches of "softwood scrub".



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	5	Lower slopes and major drainage lines, 3-12%.	Moderately deep to deep, often mottled, brown and grey, sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium to thick A horizons, with bleached A2 horizons; medium clay B horizons, often with pebbles or cobble; alkaline soil reaction trend. Brown and Grey Sodosols.	Eucalypt open forest to woodland. Queensland blue gum, Moreton Bay ash, narrow-leaved ironbark with wattles often present.	VI m6, pd3-4, ps3, nd3, sa2, e4-6
LU2	20	Crests and upper slopes, 8-15%. Rock outcrop, surface cobble and stone common in some areas.	Shallow to moderately deep, brown and yellow, non sodic duplex soils with hardsetting surfaces; sandy loam, medium to thick A horizons, usually with bleached A2 horizons; sandy clay loam to sandy clay B horizons; cobble may be present throughout profile; acid to neutral soil reaction trend. Brown and Yellow Chromosols.	Eucalypt woodland. Narrow-leaved ironbark, bloodwoods and spotted gum.	VI-VII m6, pd2-3, pd3, r2-5, e3-4
LU3	20	Midslopes, 10-20%. Rock outcrop, surface cobble and stone common in some areas.	Shallow to moderately deep, brown and yellow, sodic and non sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium A horizons; sandy, light to medium clay B horizons; cobble may be present throughout profile; acid to neutral soil reaction trend. Brown and Yellow Chromosols.	Eucalypt woodland. Narrow-leaved ironbark and silver-leaved ironbark.	V1-VII m4, pd2-3, ps3, nd3, ts6, r3-5, e6

ARANBANGA 2 (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU4	5	Lower concave slopes, 5-10%.	Deep, brown and grey, sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, medium to thick A horizons, with bleached A2 horizons; medium clay B horizons often gravelly; alkaline soil reaction trend. Brown and Grey Sodosols.	Eucalypt woodland. Narrow-leaved ironbark, Queensland blue gum and Moreton Bay ash.	VI m6, pd3-4, nd3, sa2, e4
LU5	20	Midslopes, 12-20%. Rock outcrop and many to common, surface stone may be present.	Shallow, black, grey and brown, non cracking clays and sodic duplex soils with hardsetting surfaces; clay loam to light clay, medium A horizons, usually with bleached A2 horizons; medium clay B horizons; usually common to many pebbles throughout profile; neutral to alkaline soil reaction trend. Black, Grey and Brown Dermosols and Chromosols.	Eucalypt woodland. Narrow-leaved ironbark and silver-leaved ironbark.	VI m6, pd3-4, ps3, nd3, ts6, r2-4, e6
LU6	25	Crests and upper slopes, 15-25%. Rock outcrop and surface stone common in some areas.	Shallow, black, grey and brown, non cracking clays and sodic duplex soils with hardsetting surfaces; clay loam to light clay, medium A horizons, usually with bleached A2 horizons; medium clay B horizons; cobble often throughout profile; alkaline soil reaction trend. Black, Grey and Brown Dermosols and Sodosols.	Eucalypt woodland. Narrow-leaved ironbark.	VI-VII m6, pd3-4, ps3, nd3, r2-4, e6-7
LU7	<5	Lower slopes and drainage lines, 2-5%.	Deep, black and grey, sodic duplex soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons, usually with bleached A2 horizons; medium clay B horizons, alkaline soil reaction trend. Black and Grey Dermosols and Sodosols.	Eucalypt woodland. Queensland blue gum and Moreton Bay ash.	IV or VI m4 or 6, pd2-4, ps3, nd3, sa2-3, e4
LU8	<5	Closed drainage depressions.	Deep, mottled, grey, cracking clays with hardsetting to self mulching surfaces; light to medium clay A horizons; medium clay B horizons; neutral to alkaline soil reaction trend. Grey Vertosols.	Eucalypt open woodland. Queensland blue gum and Moreton Bay ash.	V m3, pm3, w5

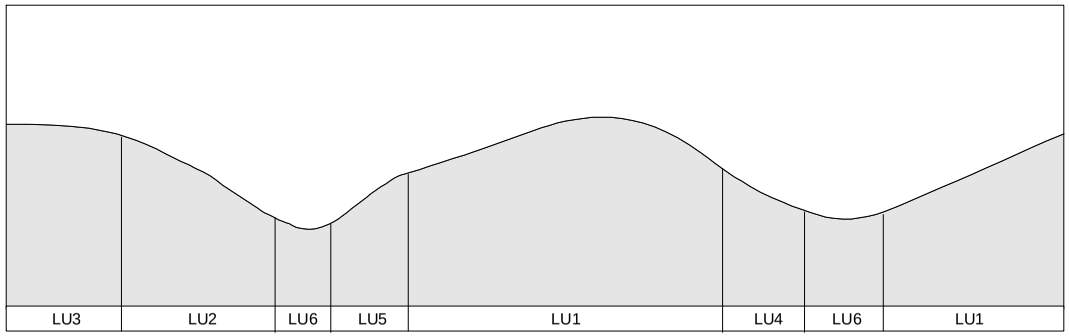
LAND SYSTEM - TORSDALE (Td)

General Description: Undulating low hills to rolling low hills on acid volcanic rocks. Major soils are moderately deep to deep, brown, red and yellow, non sodic to sodic duplex soils and gradational soils (Chromosols, Dermosols and Kandosols).

Geology: Torsdale Beds - Acidic tuff, agglomerate, conglomerate.

Landform: Undulating low hills to rolling low hills.

Vegetation: Eucalypt and eucalypt shrubby open forest to woodland with limited clearing. Spotted gum, narrow-leaved ironbark, rusty gum, bloodwoods, Queensland blue gum, wattles, cypress pine, quinine and dogwood.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	30	Crests and upper slopes, 3-8%. Rock outcrop may be present.	Moderately deep to deep, brown and yellow, non sodic duplex soils with hardsetting surfaces; loamy sand to sandy loam, medium to thick A horizons, with bleached A2 horizons; sandy, light to medium clay B horizons; acid soil reaction trend. Brown and Yellow Chromosols.	Eucalypt open forest. Rusty gum, Queensland blue gum, gum topped box, narrow-leaved ironbark and wattles.	VI m6, nd3, r1-4, e3
LU2	20	Upper to mid slopes, 6-12%.	Moderately deep to deep, usually mottled, brown, non sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, medium A horizons, occasionally with bleached A2 horizons; sandy, medium clay B horizons; acid soil reaction trend. Brown Chromosols.	Eucalypt shrubby open forest. Spotted gum, brown bloodwood, narrow-leaved ironbark with forest she oak, rusty gum, grey gum, white mahogany, red ash and wattles.	VI m6, nd3, e3-4
LU3	20	Crests and upper slopes, 3-5%.	Moderately deep, red and brown, gradational soils with hardsetting surfaces; loam to loam fine sandy, medium to thick A horizons; clay loam sandy to light clay B horizons; acid soil reaction trend. Red and Brown Kandosols and Dermosols.	Eucalypt shrubby open forest. Spotted gum, Queensland peppermint, narrow-leaved ironbark, quinine, red ash and wattles.	IV m4, ps3, nd3, e2-3
LU4	10	Mid and upper slopes, 10-15%, some as steep as 25%. Rock outcrop often present.	Shallow to moderately deep, brown, sodic and non sodic duplex soils with hardsetting surfaces and minor uniform, coarse textured soils; coarse sand to loamy coarse sand, thick to very thick A horizons, usually with bleached A2 horizons; coarse sandy, medium clay, occasionally coarse sand B horizons; acid soil reaction trend. Brown Chromosols and occasionally Orthic Tenosols.	Eucalypt woodland. Narrow-leaved ironbark, pink bloodwood, cypress pine, Moreton Bay ash, rusty gum, dogwood and wattles.	VI-VII m6, pd3, nd3, ts6-7, r2-4, e6

TORSDALE (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU5	10	Mid and upper slopes, 3-8%, some as steep as 15%.	Moderately deep to deep, red and brown, non sodic and sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, medium to thick A horizons, usually with bleached A2 horizons; sandy, medium clay B horizons; rock fragments usually throughout profile; acid soil reaction trend. Red and Brown Chromosols and Sodosols.	Eucalypt shrubby open forest. Spotted gum, narrow-leaved ironbark, brown bloodwood, Queensland peppermint, white mahogany, red ash, wattles and thready bark she-oak.	VI m6, nd3, (ts4), e3-4
LU6	10	Lower slopes, 3-8%.	Moderately deep to deep, usually mottled, brown and grey, sodic duplex soils with hardsetting surfaces; loamy sand to sandy clay loam, medium to thick A horizons, with bleached A2 horizons; sandy, light to medium clay B horizons, with many coarse fragments; acid and alkaline soil reaction trend. Brown and Grey Chromosols and Sodosols.	Eucalypt shrubby woodland. Rough barked apple, gum topped box, narrow-leaved ironbark and bulloak.	VI m6, pd2-3, nd3, e6

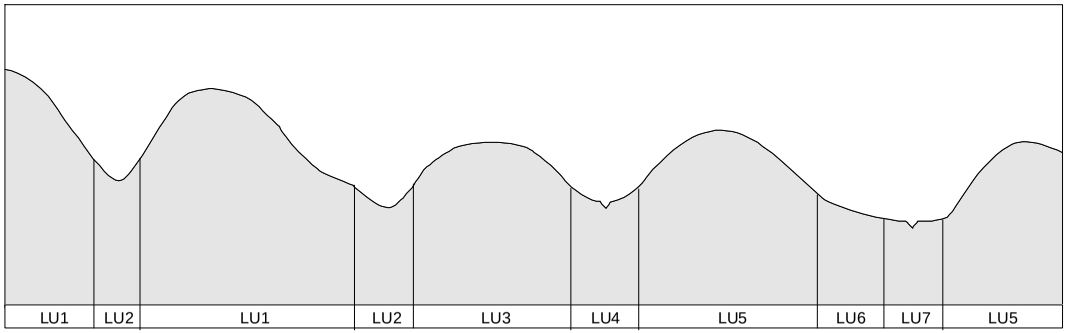
LAND SYSTEM - ARANBANGA 3 (Ab3)

General Description: Rolling low hills on acid volcanic rocks. Major soils are shallow, stony, uniform, medium and coarse textured soils, red and brown, non sodic duplex soils and black, grey and brown, non cracking clays and sodic duplex soils (Tenosols, Chromosols, Dermosols and Sodosols).

Geology: Undivided formation of the Aranbanga Volcanic Group - Andesitic to rhyolitic flows and pyroclastics, minor polymictic conglomerate, volcanic breccia.

Landform: Rolling low hills.

Vegetation: Eucalypt open forest to woodland, extensively cleared. Narrow-leaved ironbark, spotted gum, bloodwoods, Queensland blue gum and Moreton Bay ash.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	20	Crests, upper and mid slopes, 12-30%, some slopes up to 40%. Rock outcrop and surface stone may be present.	Shallow, stony, uniform, coarse to medium textured soils over rock and brown, non sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, medium to thick A horizons, with bleached A2 horizons; (when present) sandy loam to light clay B horizons; few to abundant pebbles throughout profile; acid to neutral soil reaction trend. Bleached-Leptic Tenosols and Brown Chromosols.	Eucalypt open forest. Narrow-leaved ironbark, spotted gum, bloodwoods with red ash often present.	VII m6, pd4, nd3, ts6-7, r2-5, e6-7
LU2	<5	Lower concave slopes, 8-15%. Rock outcrop and surface stone may be present.	Shallow to moderately deep, uniform, medium textured soils over rock, and often mottled, grey and yellow, non sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium to thick A horizons, with bleached A2 horizons; (when present) light to light medium clay B horizons; few to common stone and cobble throughout profile; acid to neutral soil reaction trend. Bleached-Leptic Tenosols and Yellow and Grey Chromosols.	Eucalypt woodland. Silver-leaved ironbark and narrow-leaved ironbark.	VI-VII m6, pd2-4, ps3, ts4, nd3, r2-5, e4 or 6
LU3	30	Crests and slopes, 10-20%. Rock outcrop and surface stone may be present in some areas.	Shallow, red and brown, non sodic duplex soils and uniform, medium textured soils over rock with hardsetting surfaces; sandy clay loam to clay loam, medium A horizons; (when present) light to medium clay B horizons; pebbles often present throughout profile; acid to neutral soil reaction trend. Red and Brown Chromosols and Leptic Tenosols.	Eucalypt open forest to woodland. Silver-leaved ironbark, narrow-leaved ironbark and bloodwoods.	VI-VII m6, pd3-4, ps3, nd3, ts6, r2-5, e6

ARANBANGA 3 (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU4	<5	Lower slopes and major drainage lines, 3-12% slope.	Moderately deep to deep, often mottled, brown and grey, sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium to thick A horizons, with bleached A2 horizons; medium clay B horizons, often with pebbles or cobble; alkaline soil reaction trend. Brown and Grey Sodosols.	Eucalypt open forest to woodland. Queensland blue gum, Moreton Bay ash, narrow-leaved ironbark with wattles often present.	VI m6, pd2-3, ps3, nd3, e3-4
LU5	25	Crests and upper slopes, 15-25%. Rock outcrop and surface stone common in some areas.	Shallow, black, grey and brown, non cracking clays and sodic duplex soils with hardsetting surfaces; clay loam to light clay, medium A horizons, often with bleached A2 horizons; medium clay B horizons; cobble often throughout profile; alkaline soil reaction trend. Black, Grey and Brown Dermosols and Sodosols.	Eucalypt woodland. Narrow-leaved ironbark.	VI-VII m4-6, pd3-4, nd3, ps3, ts6-7, r2-5, e6
LU6	20	Midslopes, 12-20%. Rock outcrop and surface stone common in some areas.	Shallow, black, grey and brown, non cracking clays and sodic duplex soils with hardsetting surfaces; clay loam to light clay, medium A horizons, often with bleached A2 horizons; medium clay B horizons; usually common to many pebbles throughout profile; neutral to alkaline soil reaction trend. Black, Grey and Brown Dermosols and Chromosols.	Eucalypt woodland. Narrow-leaved ironbark and silver-leaved ironbark.	VI-VII m4-6, pd3-4, ps3, nd3, ts6, r2-5, e6
LU7	<5	Lower slopes and drainage lines, 2-5% slope.	Deep, black and grey, sodic duplex soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons, often with bleached A2 horizons; medium clay B horizons; alkaline soil reaction trend. Black and Grey Dermosols and Sodosols.	Eucalypt woodland. Queensland blue gum and Moreton Bay ash.	IV or VI m4 or 6, pd2-4, ps3, nd3, sa2-3, e4

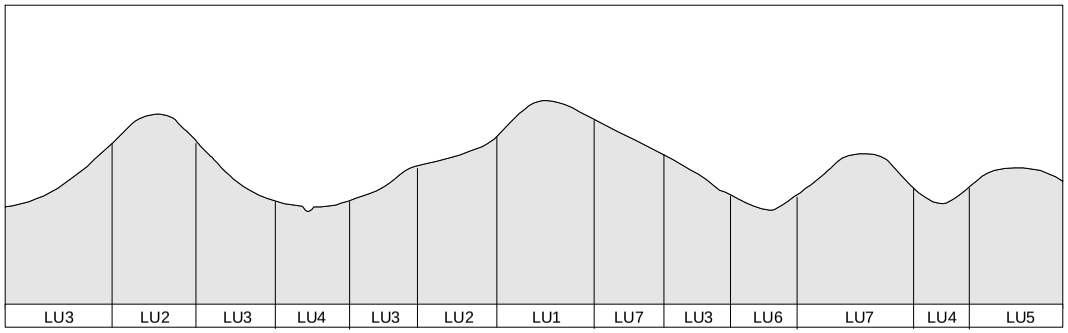
LAND SYSTEM - ARANBANGA 4 (Ab4)

General Description: Rolling hills to rolling low hills on acid volcanic rocks. Major soils are shallow to moderately deep, brown, red and yellow, non sodic duplex soils and gradational soils and moderately deep to deep, brown, yellow and grey, sodic duplex soils (Chromosols, Dermosols and Sodosols).

Geology: Undivided formation of the Aranbanga Volcanic Group - Andesitic to rhyolitic flows and pyroclastics, minor polymictic conglomerate, volcanic breccia.

Landform: Rolling hills to rolling low hills.

Vegetation: Eucalypt open forest to woodland with limited clearing, extensively cleared in some areas. Spotted gum, narrow-leaved ironbark, Queensland blue gum, silver-leaved ironbark and bloodwoods.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	25	Crests and upper slopes, 10-20%. Rock outcrop common in some areas.	Moderately deep to deep, red, gradational and non sodic duplex soils with hardsetting surfaces; loam to clay loam, medium A horizons; light to medium clay B horizons; acid to neutral soil reaction trend. Red Chromosols and Dermosols.	Eucalypt open forest. Spotted gum, narrow-leaved ironbark, bloodwoods, *Casuarina* species and wattles.	IV or VI m3-4, ps3, nd3, ts4 or 6, r2-4, e4 or 6
LU2	10	Crests, upper and midslopes, 15-25%. Rock outcrop and surface coarse fragments common.	Shallow, brown, gradational and non sodic duplex soils and uniform, medium textured soils with hardsetting surfaces; clay loam to light clay, thin to medium A horizons; (when present) light to light medium clay B horizons; few to common pebbles throughout profile; acid soil reaction trend. Brown Dermosols and Chromosols and Leptic Tenosols.	Eucalypt open forest. Spotted gum, narrow-leaved ironbark, wattles and rosewood.	VI-VII m6, pd3-4, ps3, nd3, ts6-7, r4-5, e6-7
LU3	35	Midslopes, 10-20%.	Shallow to moderately deep, brown and yellow, non sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium A horizons, with bleached A2 horizons; medium clay B horizons; neutral soil reaction trend. Brown and Yellow Chromosols.	Eucalypt woodland. Narrow-leaved ironbark, gum topped box and wattles.	VI m4 or 6, pd2-3, ps3, nd3, ts6, e6

ARANBANGA 4 (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU4	5	Lower slopes and drainage lines, 5-12% slope.	Moderately deep to deep, (sometimes mottled), brown and yellow, sodic duplex soils with hardsetting surfaces; (alluvial soils usually present in major drainage lines); sandy clay loam to clay loam, medium A horizons; medium clay B horizons; occasionally cobble in profile; neutral and alkaline soil reaction trend. Brown and Yellow Chromosols and Sodosols.	Eucalypt woodland. Spotted gum, narrow-leaved ironbark, Queensland blue gum, Moreton Bay ash. *Melaleuca* species and River oak fringe major drainage lines.	VI m3-4, pd2-3, ps3, nd3, e6
LU5	10	Lower ridges, 5-15% slopes.	Shallow to moderately deep, brown and red, non sodic duplex soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons; light to medium clay B horizons; neutral to alkaline soil reaction trend. Brown Dermosols and Chromosols.	Eucalypt woodland. Narrow-leaved ironbark, bloodwoods and silver-leaved ironbark.	IV m4, pd2-3, ps3, nd3, e3-4
LU6	5	Lower slopes and drainage lines, 3-12% slope.	Moderately deep to deep, (often mottled), brown and grey, sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium to thick A horizons, with bleached A2 horizons; medium clay B horizons, often with pebbles or cobble; alkaline (occasionally acid) soil reaction trend. Brown and Grey Sodosols.	Eucalypt open forest to woodland. Queensland blue gum, Moreton Bay ash, narrow-leaved ironbark with wattles often present.	VI m4 or 6, pd3-4, ps3, nd3, sa2, ts4, e6
LU7	10	Crests and upper slopes, 10-20%. Surface cobble and rock outcrop may be present.	Shallow to moderately deep, (often mottled), brown, non sodic duplex soils; sandy loam to sandy clay loam, medium A horizons; sandy, light to light medium clay B horizons; acid to neutral soil reaction trend. Brown Chromosols.	Eucalypt woodland. Narrow-leaved ironbark and silver-leaved ironbark.	VI m4 or 6, pd3-4, nd3, ts4 or 6, r2-4, e6

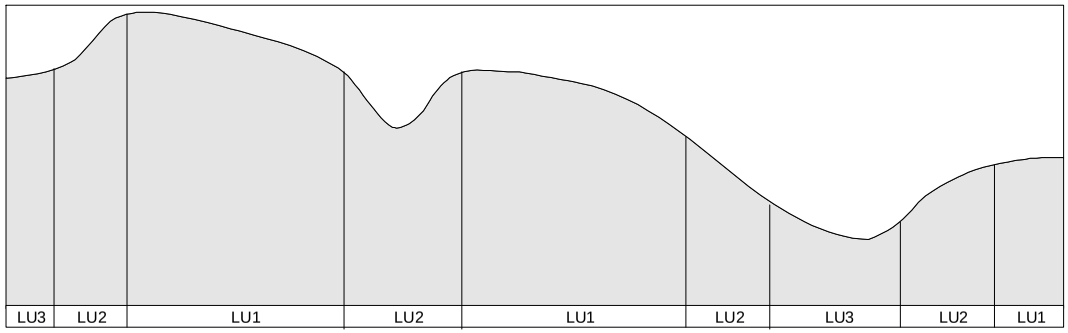
LAND SYSTEM - EAGLE (Ea)

General Description: Rolling hills on acid volcanic rocks. Major soils are shallow to moderately deep, uniform, medium and coarse textured soils over rock and moderately deep to deep, non sodic duplex soils (Rudosols, Sodosols and Chromosols).

Geology: Mount Eagle Beds - Rhyolitic and dacitic flows and pyroclastics.

Landform: Rolling hills.

Vegetation: Eucalypt woodland to open woodland (often shrubby), with limited clearing. Narrow-leaved ironbark, spotted gum, pink bloodwood with red ash, quinine and wattles.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	40	Broad ridge crests and upper slopes, 3-10%. Rock outcrop often present.	Shallow to moderately deep, coarse and medium textured uniform soils over rock and brown, sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam A horizons, sometimes with bleached A2 horizons, (if present) light medium clay B horizons; usually gravelly throughout profile; acid soil reaction trend. Leptic Rudosols and Brown Sodosols.	Eucalypt woodland to open woodland, sometimes shrubby. Narrow-leaved ironbark, spotted gum often with red ash, wattles and grass trees.	VI m6, pd3-4, nd3, r2-4, e6
LU2	35	Mid and upper slopes, 15-25%, some slopes up to 35%. Rock outcrop and surface stone abundant.	Shallow, uniform, coarse and medium textured soils over rock (occasionally brown, sodic duplex soils) with hardsetting surfaces; sandy loam to loam, medium to thick A horizons; (occasionally present) light to medium clay B horizons; many rock fragments throughout profile; acid soil reaction trend. Leptic Rudosols, occasionally Brown Sodosols.	Eucalypt open woodland and shrubby open woodland. Narrow-leaved ironbark, pink bloodwood with red ash, quinine and wattles.	VII m6, pd4, nd3, ts6-7, r5, e6-7
LU3	25	Mid and lower slopes, 8-15%. Surface stone and rock outcrop may be present.	Moderately deep to deep, brown, sodic duplex soils with hardsetting surfaces; loamy sand to sandy loam, thick to very thick A horizons, with bleached A2 horizons; light to medium clay B horizons, with many rock fragments; acid soil reaction trend. Brown Chromosols and Sodosols.	Eucalypt shrubby open forest. Narrow-leaved ironbark, spotted gum and pink bloodwood with quinine, red ash and wattles.	VI m6, nd3, ts4, r2-4, e6

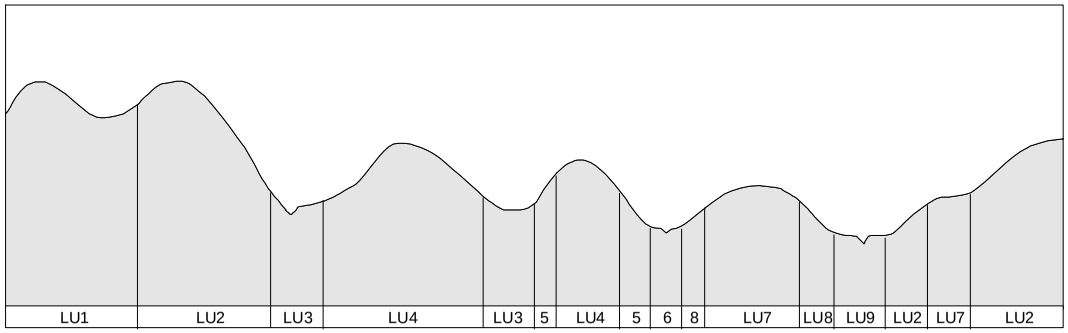
LAND SYSTEM - ARANBANGA 5 (Ab5)

General Description: Rolling hills to steep hills on acid volcanic rocks. Major soils are shallow, stony lithosols, red and brown, non sodic duplex soils and gradational soils and moderately deep to deep, brown, yellow and grey, sodic and non sodic duplex soils (Tenosols, Dermosols, Sodosols and Chromosols).

Geology: Undivided formation of the Aranbanga Volcanic Group - Andesitic to rhyolitic flows and pyroclastics, minor polymictic conglomerate, volcanic breccia.

Landform: Rolling hills to steep hills with minor plateaus.

Vegetation: Eucalypt open forest and woodland, limited to extensive clearing. Narrow-leaved ironbark, spotted gum, bloodwoods, Queensland blue gum and Moreton Bay ash with patches of "softwood scrub" species.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	10	Undulating rises on a plateau, 3-8% slope. Rock outcrop and surface stone common.	Very shallow to shallow, stony, uniform, medium and fine textured soils over rock, with hardsetting surfaces; sandy clay loam to light clay, medium A horizons; acid soil reaction trend. Leptic Tenosols.	Eucalypt woodland. Narrow-leaved ironbark, spottd gum and zamia.	VII m6, pd6, ps3, nd3, r4-5, e4, x6
LU2	40	Crests and slopes, 15-40%, some slopes up to 60%. Rock outcrop and surface stone common to abundant.	Shallow, stony, uniform, medium and coarse textured soils over rock and brown and red, gradational and non sodic duplex soils with hardsetting surfaces; sandy loam to clay loam A horizons, usually with bleached A2 horizons; (when present) brown and red, sandy loam to light clay B horizons; few to abundant cobble throughout profile; acid soil reaction trend. Bleached-Leptic Tenosols and Red Dermosols and Chromosols.	Eucalypt open forest . Narrow-leaved ironbark, spotted gum, silver-leaved ironbark with "softwood scrub" species.	VII-VIII m6, pd4-6, ps3, nd3, ts7-8, r4-5, e6-7
LU3	5	Lower concave slopes, 8-15%. Stone and rock outcrop may be present.	Shallow to moderately deep, uniform, medium textured soils over rock and (often mottled), grey and brown, sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium to thick A horizons, with bleached A2 horizons; (when present) light to light medium clay B horizons; few to common, stone and cobble throughout profile; acid to neutral soil reaction trend. Bleached-Leptic Tenosols and Grey and Brown Chromosols.	Eucalypt woodland. Silver-leaved ironbark and narrow-leaved ironbark.	VI m4 or 6, pd2-4, ps3, nd3, ts4, r2-4, e6

ARANBANGA 5 (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU4	20	Crests, upper and midslopes, 12-30%, some slopes up to 40%. Stone and rock outcrop may be present on surface.	Shallow, stony, uniform, coarse to medium textured soils over rock and occasionally brown, non sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, medium to thick A horizons, with bleached A2 horizons; (when present) sandy loam to light clay B horizons; few to abundant pebbles throughout profile; acid to neutral soil reaction trend. Bleached-Leptic Tenosols and Brown Chromosols.	Eucalypt open forest. Narrow-leaved ironbark, spotted gum, bloodwoods and red ash.	VI-VII m6, pd4-6, ps3, nd3, ts6-7, r3-5, e6-7
LU5	5	Midslopes, 15-25%. Stone and cobble common on surface. Rock outcrop often present.	Shallow to moderately deep, often mottled, brown and yellow, non sodic duplex soils, and uniform, medium textured soils with hardsetting surface over rock; sandy clay loam to clay loam, thick A horizons, with bleached A2 horizons; (when present) light to light medium clay B horizons; common to abundant stone and gravel throughout profile; acid to neutral soil reaction trend. Brown and Yellow Chromosols and Dermosols and Bleached-Leptic Tenosols.	Eucalypt open forest. Narrow-leaved ironbark, spotted gum, wattles and red ash.	VI-VII m6, pd3-4, ps3, nd3, ts6-7, r4-5, e6-7
LU6	5	Lower slopes and major drainage lines, 3-12%.	Moderately deep to deep, (often mottled), brown and grey, sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium to thick A horizons, with bleached A2 horizons; medium clay B horizons, often with pebbles or cobble; alkaline (occasionally acid) soil reaction trend. Brown and Grey Sodosols.	Eucalypt open forest to woodland. Queensland blue gum, Moreton Bay ash, narrow-leaved ironbark with wattles often present. River she-oak and *Melaleuca* species often fringe drainage lines.	VI m6, pd4, ps3, nd3, sa2, ts4, e6
LU7	5	Crests and upper slopes, 8-15%. Often surface stone present.	Moderately deep to deep, red, non sodic and sodic duplex soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons; medium clay B horizons; pebbles and cobble usually throughout profile; neutral to alkaline soil reaction trend. Red Chromosols and Dermosols.	Eucalypt open forest. Narrow-leaved ironbark, silver-leaved ironbark, Queensland blue gum, Moreton Bay ash and rusty gum.	IV m3-4, ps3, nd3, (ts4), r2-4, e3-4
LU8	5	Midslopes, 10-15%. Often surface stone present.	Moderately deep to deep, brown and yellow, sodic and non sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium A horizons, with bleached A2 horizons; medium clay B horizons; pebbles and cobble usually throughout profile; neutral to alkaline soil reaction trend. Brown and Yellow Chromosols and Sodosols.	Eucalypt open forest. Queensland blue gum narrow-leaved ironbark, Moreton Bay ash and rusty gum.	VI m3-4, pd3-4, ps3, nd3, r2-4, ts4, e6
LU9	5	Lower slopes and drainage lines, 2-5%.	Deep, black and grey, sodic duplex soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons, often with bleached A2 horizons; medium clay B horizons, alkaline soil reaction trend. Black and Grey Dermosols and Sodosols.	Eucalypt woodland. Queensland blue gum and Moreton Bay ash.	IV-VI m3-4 or 6, pd3-4, ps3, nd3, sa2-3, t4-6, e3

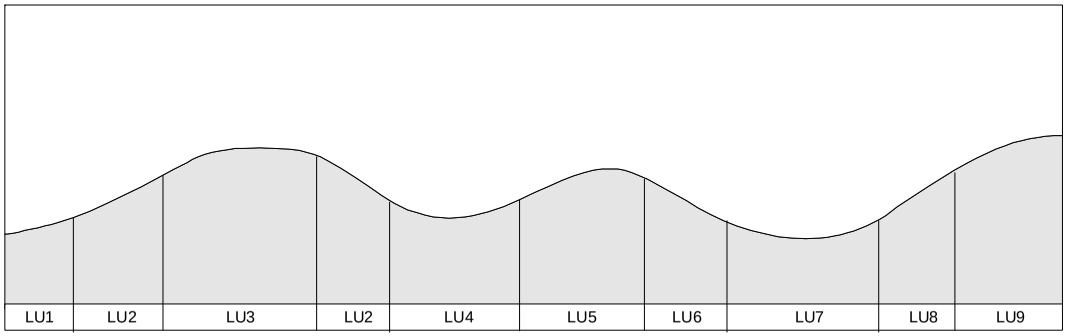
LAND SYSTEM - MOOCOO (Mo)

General Description: Undulating rises to undulating low hills on acid intrusive rocks. Major soils are shallow to moderately deep, brown and grey, sodic duplex soils and moderately deep to deep, brown and black, cracking and non cracking clays (Chromosols, Sodosols, Vertosols and Dermosols).

Geology: Moocoorooba Adamellite - Biotite adamellite.

Landform: Undulating rises to undulating low hills.

Vegetation: Brigalow forest and eucalypt shrubby woodland, limited to complete clearing. Brigalow, wilga, false sandalwood, poplar box, silver-leaved ironbark, gum topped box, narrow-leaved ironbark and bloodwoods.



LandUnit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	10	Lower concave slopes, 2-3%.	Moderately deep to deep, brown, non cracking and cracking clays with hardsetting surfaces; light clay, medium A horizons; medium clay B horizons; alkaline soil reaction trend. Brown Dermosols and Vertosols.	Eucalypt shrubby woodland. Poplar box and wilga.	III-IV m3-4, ps3, pm3, e2
LU2	10	Mid slopes, 5-8%.	Moderately deep to deep, brown, non cracking and cracking clays with hardsetting to self mulching surfaces; light to light medium clay, medium A horizons; medium clay B horizons; alkaline soil reaction trend. Brown Dermosols and Vertosols.	Eucalypt shrubby woodland. Poplar box, bloodwoods, gum topped box, wilga and brigalow	III-IV m2-4, ps3, pm3, e3
LU3	5	Crests and upper slopes, 3-8%. Rock outcrop may be present.	Shallow to moderately deep, red and brown, sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium to thick A horizons; medium clay B horizons, usually with many to abundant coarse fragments; acid to neutral soil reaction trend. Red and Brown Chromosols.	Eucalypt shrubby woodland. Poplar box, bloodwoods and wilga.	VI m4 or 6, pd3-4, ps3, r2-4, e3-4

MOOCOO (continued)

LandUnit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU4	10	Lower concave slopes, 3-5%.	Deep, brown and black, cracking clays with self mulching surfaces; light to light medium clay A horizons; medium clay B horizons, often with few to many coarse fragments; alkaline soil reaction trend. Brown and Black Vertosols.	Brigalow forest. Brigalow.	III m3, pm3, e2
LU5	5	Crests and upper slopes, 3-8%. Stone may be present on surface.	Shallow to moderately deep, often mottled, red and brown, sodic and non sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, medium A horizons, often with bleached A2 horizons; medium clay B horizons; neutral soil reaction trend. Brown Chromosols.	Eucalypt shrubby woodland. Narrow-leaved ironbark, silver-leaved ironbark, poplar box, gum topped box and wilga.	VI m6, pd3-4, ps3, r2-4, e3-4
LU6	10	Mid and lower slopes, 10-12%. Stone may be present on surface.	Moderately deep, brown, sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, medium to thick A horizons; medium clay B horizons; neutral to alkaline soil reaction trend. Brown Chromosols.	Eucalypt shrubby woodland. Silver-leaved ironbark, poplar box, wilga and false sandalwood.	VI m4 or 6, pd3-4, ps3, r2-4, e6
LU7	25	Lower slopes, 2-5%.	Moderately deep, brown and grey, sodic duplex soils and non cracking clays with firm to hardsetting surfaces; clay loam to light clay, medium to thick A horizons; medium clay B horizons; acid or alkaline soil reaction trend. Brown Sodosols, Chromosols and Dermosols.	Shrubland. Brigalow, sometimes with wilga, wattles and sandalwood.	IV or VI m4 or 6, (pd3-4), ps3, e3
LU8	20	Midslopes, 5-8%. Often medium to coarse gravel on surface.	Moderately deep, black and brown, non cracking clays with hardsetting surfaces; light clay A horizons; medium clay B horizons; alkaline soil reaction trend. Black and Brown Dermosols.	Shrubland. Brigalow and wilga.	IV m4, ps3, r2, e3
LU9	5	Crests and upper slopes, 3-6%. Gravel or stone may be present on surface.	Shallow, brown, sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, medium A horizons; light to medium clay B horizons; acid to neutral soil reaction trend. Brown Chromosols.	Eucalypt shrubby woodland. Narrow-leaved ironbark, gum topped box, wilga and “softwood scrub” species.	VI m6, pd4, ps3, r3-4, e3

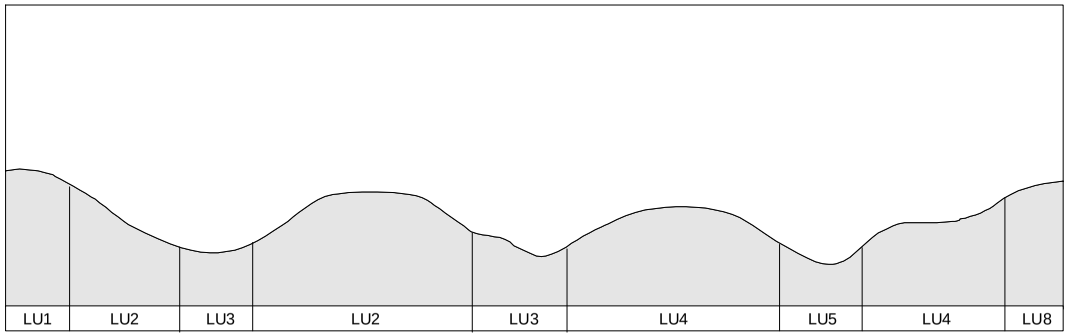
LAND SYSTEM - GLANDORE (Gd)

General Description: Undulating rises to undulating low hills on acid intrusive rocks. Major soils are moderately deep to deep, red and brown, sodic duplex and gradational soils (Chromosols, Sodosols and Dermosols).

Geology: Glandore Granodiorite - Granodiorite, minor diorite, tonalite and adamellite.

Landform: Undulating rises to undulating low hills.

Vegetation: Eucalypt woodland and "softwood scrub" forest, limited to complete clearing. Silver-leaved ironbark, narrow-leaved ironbark, bloodwoods, poplar box, Queensland blue gum and "softwood scrub" species.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	5	Crests and ridges, 5-8%. Rock outcrop may be present.	Shallow, red, sodic duplex soils with hardsetting surfaces; loamy sand to sandy loam, medium to thick A horizons, usually with bleached A2 horizons; sandy light clay B horizons; neutral soil reaction trend. Red Chromosols.	Eucalypt woodland. Narrow-leaved ironbark.	VI m6, pd4, nd3, r3-4, e4
LU2	40	Broad ridge crests and midslopes, 5-10%.	Moderately deep to deep, red, sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium A horizons; medium clay B horizons; neutral to alkaline soil reaction trend. Red Chromosols.	Eucalypt woodland. Silver-leaved ironbark, bloodwoods, sometimes with patches of false sandalwood, wilga and bottle trees.	IV or VI m4 or 6, ps3, nd3, e3-4
LU3	10	Lower concave slopes, 2-5%.	Moderately deep to deep, brown, sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium to thick A horizons, with bleached A2 horizons; medium clay B horizons; alkaline soil reaction trend. Brown Chromosols and Sodosols.	Eucalypt woodland. Poplar box, Queensland blue gum, minor narrow-leaved ironbark, bloodwoods and bottle trees.	IV or VI m4 or 6, pd3-4, ps3, nd3, e4 or 6
LU4	25	Crests, broad ridges and mid and upper slopes, 5-10%.	Moderately deep to deep, red and brown, sodic duplex and gradational soils with hardsetting surfaces; sandy clay loam to clay loam, medium A horizons; light to medium clay B horizons; neutral soil reaction trend. Red and Brown Chromosols and Dermosols.	"Softwood scrub" forest. "Softwood scrub" species.	IV m4, pd2-4, ps3, nd3, e3-4

GLANDORE (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU5	15	Lower concave slopes, 2-5%.	Deep, brown, sodic duplex and gradational soils with hardsetting surfaces; clay loam, medium A horizons; light to medium clay B horizons; neutral to alkaline soil reaction trend. Brown Chromosols and Dermosols.	"Softwood scrub" forest. "Softwood scrub" species.	IV or VI m4, pd2-4, nd3, ps3, e4 or 6
LU6	5	Crests, 3-8% slope. Rock outcrop may be present.	Shallow, red, sodic duplex and gradational soils with hardsetting surfaces; sandy clay loam to clay loam, medium A horizons; light clay B horizons; acid to neutral soil reaction trend. Red Chromosols and Dermosols.	"Softwood scrub" forest. "Softwood scrub" species.	VI m6, pd3-4, ps3, (r4), e6

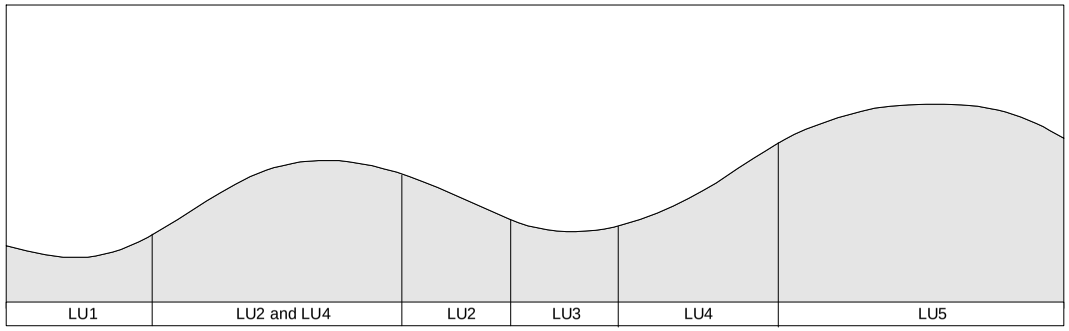
LAND SYSTEM - MINGO (Mg)

General Description: Undulating rises to undulating low hills on acid intrusive rocks. Major soils are moderately deep to deep, yellow, brown and grey, sodic duplex soils and red, brown and yellow, non sodic duplex and gradational soils (Sodosols, Chromosols and Dermosols).

Geology: Mingo Granite - Muscovite - biotite granite, biotite granodiorite, migmatite.

Landform: Undulating rises to undulating low hills.

Vegetation: Eucalypt woodland, extensive to limited clearing. Narrow-leaved ironbark, silver-leaved ironbark, gum topped box, Queensland blue gum, Moreton Bay ash, bloodwoods and corkwood wattle.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	15	Lower slopes and broad drainage depressions, 2-6%.	Deep, sometimes mottled, yellow and brown, sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium A horizons, with bleached A2 horizons; medium to heavy clay B horizons, often with rock fragments; alkaline soil reaction trend. Yellow and Brown Sodosols.	Eucalypt woodland. Gum topped box, silver-leaved and narrow-leaved ironbark.	VI m6, pd3-4, ps3, nd3, e3
LU2	25	Mid slopes, 5-10%.	Moderately deep to deep, sometimes mottled, grey and brown, sodic duplex soils with hardsetting surfaces; sand to sandy loam, medium to thick A horizons, usually with bleached A2 horizons; light to medium clay B horizons, with rock fragments often present; neutral to acid soil reaction trend. Grey and Brown Sodosols.	Eucalypt woodland. Silver-leaved ironbark, Queensland blue gum, narrow-leaved ironbark and gum topped bloodwood.	VI m6, pd2-3, nd3, e4
LU3	10	Lower slopes, 5-10%.	Deep, often mottled, yellow and brown, sodic duplex soils with hardsetting surfaces; sandy loam to clay loam, thick to very thick A horizons, often with bleached A2 horizons; light clay to medium clay B horizons, often with granitic fragments; neutral soil reaction trend. Yellow and Brown Chromosols and Sodosols.	Eucalypt woodland. Narrow-leaved ironbark, Moreton Bay ash and pink bloodwood.	VI m6, ps3, nd3, e4

MINGO (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU4	20	Mid slopes, 5-10%.	Deep, yellow and brown, sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, medium to thick A horizons, with bleached A2 horizons; light clay to medium clay B horizons, often with granitic fragments; alkaline soil reaction trend. Yellow and Brown Sodosols.	Eucalypt woodland. Narrow-leaved ironbark, Moreton Bay ash, Queensland blue gum and wattles.	VI m6, pd2-3, nd3, e4
LU5	30	Crests and upper slopes, 3-10%.	Moderately deep to deep, red, brown and yellow, non sodic duplex soils and gradational soils with hardsetting surfaces; sandy loam to clay loam, medium A horizons, occasionally with bleached A2 horizons; light clay to medium clay B horizons; granitic fragments throughout profile; neutral to alkaline soil reaction trend. Red, Brown and Yellow Chromosols and Dermosols.	Eucalypt woodland. Narrow-leaved ironbark, silver-leaved ironbark, Moreton Bay ash, bloodwoods and corkwood wattle.	VI m4 or 6, ps3, nd3, e3

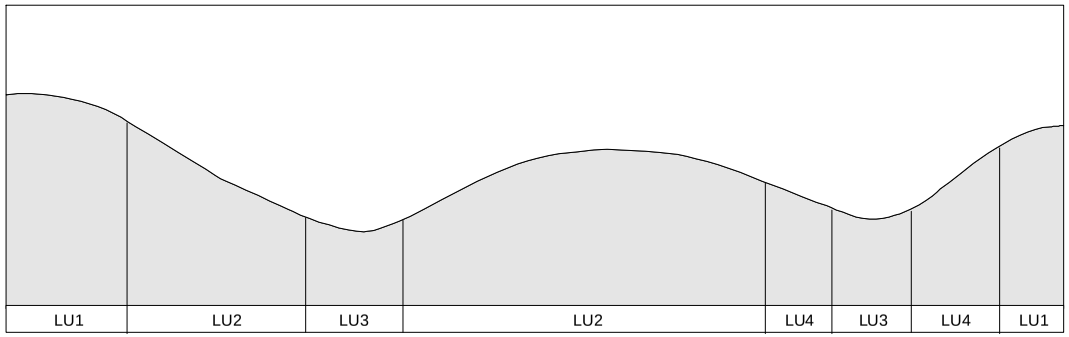
LAND SYSTEM - LOCHABAR (Lb)

General Description: Undulating rises to rolling rises on acid and intermediate intrusive rocks. Major soils are shallow to moderately deep, red and brown, non sodic duplex soils, deep, brown, sodic duplex soils and shallow, uniform, medium textured soils over rock (Chromosols, Sodosols and Rudosols).

Geology: Undifferentiated Granite - Granite, adamellite, granodiorite, diorite and gabbro.

Landform: Undulating rises to rolling rises.

Vegetation: Eucalypt woodland, limited to extensive clearing. Narrow-leaved ironbark, gum topped bloodwood, spotted gum, silver-leaved ironbark, Queensland blue gum and Moreton Bay ash.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	25	Crests and upper slopes, 4-12%. Rock outcrop may occur.	Shallow, uniform, medium textured soils over rock, and brown, non sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, medium to thick A horizons, often gravelly; if present light to medium clay B horizons; neutral to alkaline soil reaction trend. Leptic Rudosols and Brown Chromosols.	Eucalypt open forest. Spotted gum, narrow-leaved ironbark, kurrajong and wattles.	VI m6, pd3-4, nd3, (r4-5), e3-4
LU2	35	Lower ridges and mid and upper slopes, 2-8%.	Shallow to moderately deep, brown, non sodic and sodic duplex soils with hardsetting surfaces; coarse sand to sandy clay loam, medium A horizons, sometimes with bleached A2 horizons; sandy medium clay B horizons, with many granitic fragments; neutral soil reaction trend. Brown Chromosols.	Eucalypt woodland. Narrow-leaved ironbark, gum topped bloodwood, silver-leaved ironbark with Moreton Bay ash, kurrajong and quinine berry often present.	VI m6, pd2-3, nd3, e3-4
LU3	15	Lower slopes and drainage lines, 2-4%.	Deep, brown, sodic duplex soils with hardsetting surfaces; clay loam, medium A horizons, usually with bleached A2 horizons; medium clay B horizons; alkaline soil reaction trend. Brown Sodosols and Chromosols.	Eucalypt woodland. Queensland blue gum, Moreton Bay ash with silver-leaved ironbark and narrow-leaved ironbark often present.	VI m6, pd3-4, ps3, e6
LU4	25	Mid and upper slopes, 6-15%. Rock outcrop may be present.	Shallow, red and brown, non sodic duplex soils with hardsetting surfaces; sandy loam, medium A horizons; light to medium clay B horizons; neutral soil reaction trend. Red and Brown Chromosols.	Eucalypt woodland. Narrow-leaved ironbark, silver-leaved ironbark, gum topped bloodwood with emu apple, kurrajong and quinine berry sometimes present.	VI m6, pd3-4, nd3, (r4-5), e3-4

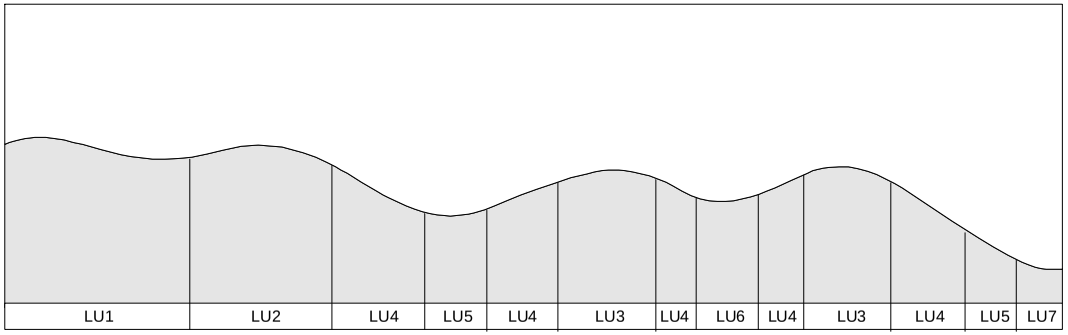
LAND SYSTEM - CHELTENHAM (Ch)

General Description: Undulating low hills on acid intrusive rocks. Major soils are moderately deep to deep, red and brown, non sodic duplex soils and brown and grey, sodic duplex soils with minor, uniform, coarse textured soils (Chromosols, Sodosols, Tenosols and Kandosols).

Geology: Cheltenham Creek adamellite with some higher relict lateritic crests.

Landform: Undulating low hills.

Vegetation: Eucalypt open forest to woodland, limited to extensive clearing. Narrow-leaved ironbark, spotted gum, rusty gum, bloodwoods, silver-leaved ironbark, Queensland blue gum, Moreton Bay ash with understorey of acacia species, budgeroo and thready bark she-oak on lateritic crests.



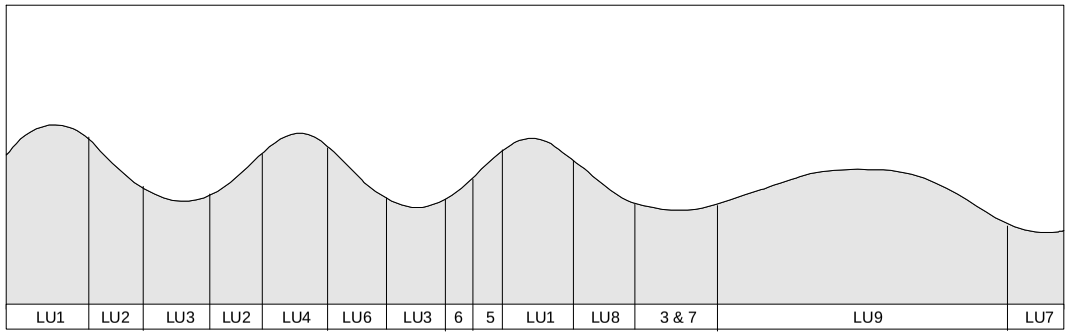
Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	10	Higher crests and upper slopes, 1-5%.	Moderately deep to deep, often mottled, red and brown, non sodic duplex soils with hardsetting surfaces; loamy coarse sand to coarse sandy loams, medium to thick A horizons, sometimes with bleached A2 horizons; sandy, light to medium clay B horizons; ironstone and quartz pebbles usually throughout; acid soil reaction trend. Red and Brown Chromosols.	Eucalypt open forest or woodland. Narrow-leaved ironbark, spotted gum, rusty gum, bloodwoods, often with shrubby understorey.	VI m6, nd3, e2
LU2	<5	Higher crests and upper slopes, 1-5%.	Deep, red, uniform, coarse textured, earthy soils with hardsetting to soft surfaces; loamy sand to sandy loam, medium to thick A horizons; loamy sand to sandy clay loam, massive and earthy B1 and B2 horizons; ironstone gravel and quartz pebbles usually throughout profile; acid soil reaction trend. Orthic Tenosols and Red Kandosols.	Eucalypt woodland. Narrow-leaved ironbark, rusty gum, bloodwoods with acacia species as understorey.	VI m6, nd3, e2
LU3	25	Ridge crests and upper slopes, 4-8%. Rock outcrop may occur.	Moderately deep to deep, red and brown, non sodic (occasionally sodic) duplex soils with hardsetting surfaces; loamy coarse sand to coarse sandy loam, medium to thick A horizons, often with bleached A2 horizons; sandy, light to medium clay B horizons with many granitic fragments; acid to neutral soil reaction trend. Red and Brown Chromosols.	Eucalypt woodland. Silver-leaved ironbark, pink bloodwood, Moreton Bay ash, spotted gum and narrow-leaved ironbark.	VI m6, nd3, e3, (r5)

CHELTENHAM (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU4	40	Midslopes, 3-6%. Rock outcrop may occur.	Moderately deep to deep, usually mottled, brown, yellow or grey, non sodic and sodic duplex soils with hardsetting surfaces; coarse sand to coarse sandy loam, thick to very thick A horizons, usually with bleached A2 horizons; sandy, light to medium clay B horizons with many granitic fragments; acid to neutral soil reaction trend. Brown, Yellow and Grey Chromosols.	Eucalypt open forest or woodland. Silver-leaved ironbark, Queensland blue gum, Moreton Bay ash, narrow-leaved ironbark and bloodwoods.	VI m6, nd3, (r5), e2-3
LU5	15	Lower slopes and drainage lines, 1-5% slope.	Moderately deep to deep, usually mottled, grey and brown, sodic duplex soils with hardsetting surfaces; loamy coarse sand to coarse sandy loam, medium to thick A horizons, with bleached A2 horizons; sandy, light to medium clay B horizons with many granitic fragments; acid, neutral and alkaline soil reaction trend. Grey and Brown Sodosols.	Eucalypt woodland to open woodland. Queensland blue gum, rusty gum, pink bloodwood with some swamp mahogany.	VI m6, pd2-4, nd3, e4
LU6	<5	Lower slopes, 1-3%.	Moderately deep to deep, red and brown, uniform, coarse textured and gradational soils with hardsetting surfaces; coarse sand to loamy coarse sand, thick to very thick A horizons, usually with bleached A2 horizons; clayey coarse sand to coarse sandy clay loam B horizons; ironstone gravel and granitic fragments usually throughout profile; acid to neutral soil reaction trend. Bleached Leptic Tenosols and Red and Brown Kandosols.	Eucalypt woodland. Silver-leaved ironbark, Moreton Bay ash and Queensland blue gum.	VI m6, nd3, e3
LU7	<5	Alluvial plains of major drainage lines, 1-3% slope.	Deep, grey and brown, sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, thin to medium A horizons, with bleached A2 horizons; medium clay B horizons; neutral to alkaline soil reaction trend. Grey and Brown Sodosols.	Eucalypt woodland. Qeensland blue gum, Moreton Bay ash, gum topped box with river she-oak and *Callistemon* and *Melaleuc*a species fringing drainage lines.	VI m6, pd4, ps3, e4

LAND SYSTEM - CRYSTALVALE (Cv)

General Description: Undulating low hills on acid intrusive rocks and sediments. Major soils are red and brown, gradational and sodic duplex soils (Dermosols, Chromosols and Sodosols).
Geology: Crystal Vale Adamellite - Adamellite.
Landform: Undulating low hills with minor areas of rolling low hills.
Vegetation: Eucalypt woodland and shrubby woodland with small patches of brigalow forest, usually extensively cleared. Narrow-leaved ironbark, bloodwoods, silver-leaved ironbark, wilga, bottle trees, false sandalwood and wattles. Brigalow occurs in patches.



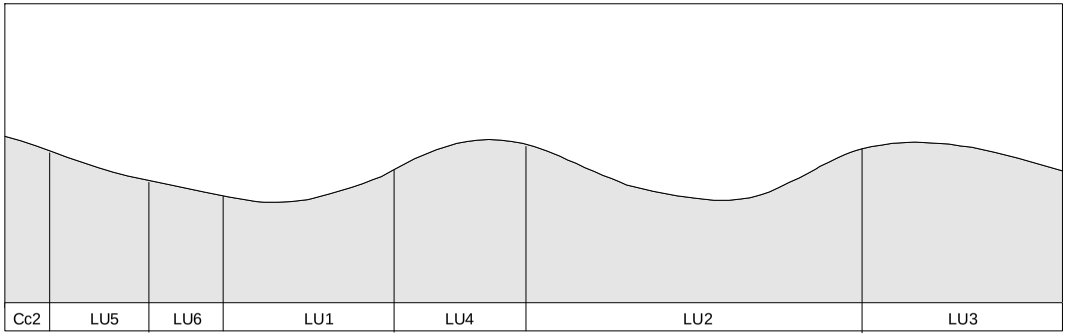
LandUnit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	15	Ridges, crests and upper slopes, 4-8%. Some slopes as high as 12%. Rock outcrop may be present.	Shallow, red, gradational and sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium A horizons; light clay B horizons, usually with rock fragments; neutral to alkaline soil reaction trend. Red Dermosols and Chromosols.	Eucalypt woodland. Narrow-leaved ironbark and bloodwoods.	VI m6, pd3-4, ps3, nd3, e3-4
LU2	15	Midslopes, 6-12%.	Moderately deep, brown, gradational and non sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium A horizons; light clay B horizons, usually with rock fragments; neutral to alkaline soil reaction trend. Brown Dermosols and Chromosols.	Eucalypt woodland. Narrow-leaved and silver-leaved ironbark.	VI m6, ps3, nd3, e3-4
LU3	5	Lower concave slopes, 3-5%.	Deep, black and brown, gradational soils with hardsetting surfaces; clay loam, medium A horizons; light clay B horizons; alkaline soil reaction trend. Black and Brown Dermosols.	Eucalypt woodland. Narrow-leaved ironbark and bloodwoods.	IV m4, ps3, nd3, e3
LU4	15	Crests and upper slopes, 5-10%.	Moderately deep to deep, brown and red, sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium A horizons, with bleached A2 horizons; medium clay B horizons; alkaline soil reaction trend. Brown and Red Sodosols and Chromosols.	Eucalypt shrubby woodland. Narrow-leaved ironbark, bottle trees, false sandalwood, wilga and wattles.	VI m6, pd3-4, ps3, nd3, e4

CRYSTALVALE (continued)

LandUnit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU5	<5	Crests, upper and midslopes, 2-6%. Surface pebbles and cobble common. Rock outcrop may occur.	Shallow, brown, non cracking clays with hardsetting surfaces; light clay, medium A horizons; light to medium clay B horizons; neutral to alkaline soil reaction trend. Brown Dermosols.	Brigalow forest. Brigalow.	VI m4, pd3, ps3, nd3, r3-4, e3
LU6	15	Midslopes, 6-10%.	Moderately deep to deep, brown, sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium to thick A horizons, often with bleached A2 horizons; light to medium clay B horizons, usually with rock fragments; alkaline soil reaction trend. Brown Chromosols.	Eucalypt scrubby woodland. Narrow-leaved ironbark, bottle trees, wilga, false sandalwood and wattles.	VI m6, pd3-4, ps3, nd3, e4
LU7	5	Lower concave slopes and drainage lines, 1-3%.	Deep, brown, sodic duplex soils with hardsetting surfaces (some black, cracking clays or alluvial soils may occur in the drainage lines); sandy clay loam to clay loam, medium A horizons, with bleached A2 horizons; light to medium clay B horizons; alkaline soil reaction trend. Brown Sodosols.	Eucalypt woodland. Rusty gum, Queensland blue gum and silver-leaved ironbark.	VI m6, pd4, ps3, nd3, e3
LU8	15	Midslopes, 6-10%.	Moderately deep, red, non sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, medium A horizons; light clay B horizons; neutral soil reaction trend. Red Chromosols.	Eucalypt woodland. Narrow-leaved ironbark and bottle trees.	VI m6, nd3, e3
LU9	10	Lower ridges and midslopes, 3-8%.	Moderately deep to deep, red, gradational soils and non sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium A horizons; light clay B horizons; alkaline soil reaction trend. Red Dermosols and Chromosols.	Eucalypt woodland. Silver-leaved ironbark and bottle trees.	IV m4, ps3, nd3, e3

LAND SYSTEM - COONAMBULA (Cb)

General Description: Undulating low hills on acid intrusive rocks. Major soils are moderately deep to deep, brown, yellow and red, sodic and non sodic duplex soils and uniform, coarse textured soils (Chromosols, Sodosols and Tenosols).
Geology: Coonambula Granodiorite - Granodiorite, adamellite.
Landform: Undulating low hills.
Vegetation: Eucalypt open forest with limited clearing. Narrow-leaved ironbark, silver-leaved ironbark, bloodwoods, Queensland blue gum and Moreton Bay ash.



Note: Clonclose 2 is also found within this land system

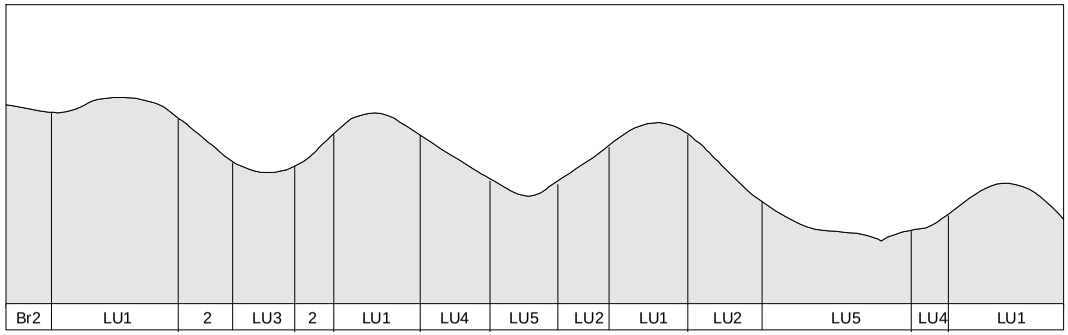
Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	25	Mid and lower slopes, 5-10%. Rock outcrop common.	Deep, brown and yellow, non sodic and sodic duplex soils with hardsetting surfaces; loamy sand to sandy loam, thick A horizons, with bleached A2 horizons; sandy, light to medium clay B horizons, usually with rock fragments throughout; acid to neutral soil reaction trend. Brown and Yellow Chromosols and Sodosols.	Eucalypt open forest. Silver-leaved ironbark, narrow-leaved ironbark, Queensland blue gum, rough barked apple and Moreton Bay ash.	VI-VII m6, nd3, r4-5, e3-4
LU2	35	Mid and lower slopes, 4-8%. Rock outcrop common.	Moderately deep to deep, brown and yellow, sodic and non sodic duplex soils and coarse textured uniform soils with hardsetting surfaces; loamy coarse sand to sandy loam, medium to thick A horizons, usually with bleached A2 horizons; coarse sand to sandy light clay B horizons, with rock fragments throughout; acid soil reaction trend. Brown and Yellow Chromosols and Sodosols and Orthic Tenosols.	Eucalypt open forest. Queensland blue gum, Moreton Bay ash, silver-leaved ironbark, narrow-leaved ironbark and pink bloodwood.	VI-VII m6, nd3, r3-5, e3-4
LU3	10	Ridge crests and upper slopes, 2-5%.	Deep, yellow and brown, sodic duplex soils with hardsetting surfaces; loamy coarse sands to light sandy clay loam, medium to thick A horizons, with bleached A2 horizons, sometimes with rock fragments; sandy light clay B horizon with rock fragments; alkaline soil reaction trend. Yellow and Brown Sodosols.	Eucalypt open forest. Narrow-leaved ironbark, pink bloodwood, Queensland blue gum, silver-leaved ironbark with rusty gum and long fruited bloodwood.	VI m6, nd3, e2-3

COONAMBULA (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU4	10	Ridge crests and upper slopes, 5-10%. Some slopes up to 20%.	Shallow to moderately deep, yellow and brown, non sodic duplex soils with hardsetting surfaces; sandy loam, medium to thick A horizons; sandy clay B horizons; acid soil reaction trend. Yellow and Brown Chromosols.	Eucalypt open forest. Narrow-leaved ironbark, long fruited bloodwood, Queensland blue gum and Moreton Bay ash.	VI m6, pd2-3, nd3, (ts6), e3-4 or (e6)
LU5	15	Mid and upper slopes, 4-8%. Rock outcrop occurs in places.	Deep, usually mottled, red and brown, sodic duplex soils with hardsetting surfaces; loamy sand to sandy loam, thick A horizons with bleach ed A2 horizons; sandy light clay B horizons with rock fragments; acid soil reaction trend. Red and Brown Chromosols and Sodosols.	Eucalypt open forest. Narrow-leaved ironbark, Moreton Bay ash and pink bloodwood.	VI-VII m6, nd3, (r4-5), e3
LU6	5	Midslopes, 3-6%.	Moderately deep, red and brown, uniform, coarse textured soils with loose surfaces; loamy sand, medium A horizons; coarse sand B horizons; acid soil reaction trend. Orthic Tenosols.	Eucalypt shrubby open woodland. Narrow-leaved ironbark and quinine bush.	VI m6, nd3, e3

LAND SYSTEM - BRIGGS 1 (Br1)

General Description: Undulating low hills to rolling low hills on acid intrusive rocks. Major soils are shallow to moderately deep, brown, yellow and grey, sodic duplex soils (Chromosols and Sodosols).
Geology: Briggs and Yenda Granodiorite - Biotite - hornblende granodiorite, hornblende - biotite granite to granodiorite, tonalite.
Landform: Undulating low hills to rolling low hills.
Vegetation: Eucalypt woodland, extensively to completely cleared. Narrow-leaved ironbark, spotted gum, bloodwoods, Moreton Bay ash and Queensland blue gum.



Note: Briggs 2 is also found within this land system

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	30	Crests and upper slopes, 8-15%. Rock outcrop may occur.	Shallow to moderately deep, brown and yellow, sodic duplex soils with hardsetting surfaces; coarse sand to sandy loam, thick to very thick A horizons; sandy, light to light medium clay B horizons with granitic fragments; neutral soil reaction trend. Brown and Yellow Chromosols.	Eucalypt woodland. Narrow-leaved ironbark, spotted gum, bloodwoods, occasionally with bottle trees.	VI m6, pd2-4, nd3, (r4), e4 or 6
LU2	30	Midslopes, 10-12%. Rock outcrop may occur.	Shallow to moderately deep, brown and yellow, sodic duplex soils with hardsetting surfaces; sand to sandy clay loam, thick A horizons, with bleached A2 horizons; sandy light to light medium clay B horizons, with granitic fragments; acid to neutral soil reaction trend. Brown and Yellow Chromosols and Sodosols.	Eucalypt woodland. Narrow-leaved ironbark, Moreton Bay ash, bloodwoods and Queensland blue gum.	VI m6, pd2-4, nd3, (r4), e4 or 6
LU3	15	Lower concave slopes, 2-6%.	Moderately deep to deep, often mottled, grey, sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, medium A horizons, with bleached A2 horizons; medium clay B horizons; alkaline soil reaction trend. Grey Sodosols.	Eucalypt woodland. Queensland blue gum and swamp mahogany.	VI m6, pd3-4, nd3, sa2-3, e6
LU4	20	Midslopes, 5-12%.	Shallow to moderately deep, yellow and brown, sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, medium A horizons, with bleached A2 horizons; sandy, light to medium clay B horizons; alkaline soil reaction trend. Yellow and Brown Chromosols and Sodosols.	Eucalypt woodland. Narrow-leaved ironbark and bloodwoods.	VI m4, pd3-4, nd3, sa2-3, e6
LU5	<5	Lower slopes and major alluvial flats, 1-3%.	Deep, often mottled, grey and brown, sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, medium to thick A horizons, with bleached A2 horizons; light to medium clay B horizons; alkaline soil reaction trend. Grey and Brown Sodosols and Chromosols.	Eucalypt open forest and woodland. Queensland blue gum, apple trees, Moreton Bay ash, gum topped box and silver-leaved ironbark.	IV m6, pd3-4, nd3, sa2-3, e3-4

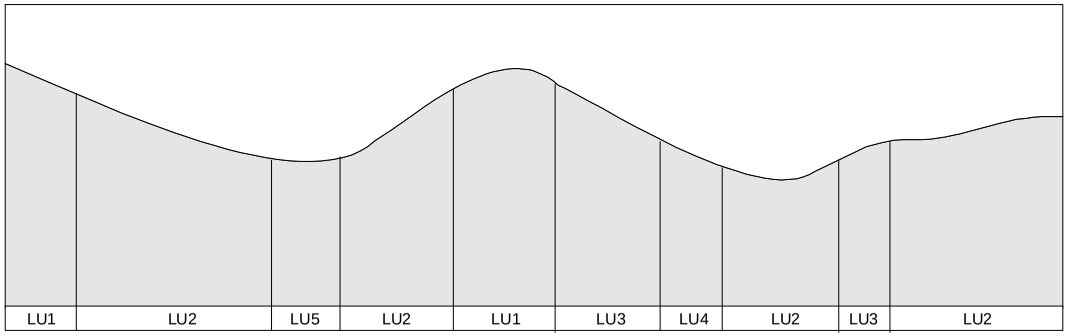
LAND SYSTEM - CULCRAIGIE (Cg)

General Description: Undulating low hills to rolling low hills on acid intrusive rocks. Major soils are shallow to moderately deep, uniform, coarse textured soils and red and brown, sodic and non sodic duplex soils (Tenosols, Chromosols and Sodosols).

Geology: Culcraigie Granite - Granite.

Landform: Undulating low hills to rolling low hills.

Vegetation: Eucalypt woodland with limited clearing. Narrow-leaved ironbark, silver-leaved ironbark, pink bloodwood, Queensland blue gum and Moreton Bay ash.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	35	Ridge crests and upper slopes, 8-12%, with some slopes up to 20%. Rock outcrop common to abundant.	Shallow to moderately deep, uniform, coarse textured soils with hardsetting surfaces; coarse sand to sandy loam, medium A horizons; coarse sand B horizons; granitic fragments throughout profile; acid to neutral soil reaction trend. Orthic Tenosols.	Eucalypt woodland. Narrow-leaved ironbark, pink bloodwood, quinine, red ash and wattles.	VI-VII m6, pd2-3, nd3, ts6, r4-5, e3-4
LU2	40	Mid and lower slopes, 4-8%, with some minor drainage lines.	Shallow to moderately deep, red and brown, sodic duplex soils with hardsetting surfaces; loamy sand to sandy loam, thick A horizons, with bleached A2 horizons; sandy, light to medium clay B horizons; rock fragments throughout profile; acid to neutral soil reaction trend. Red and Brown Sodosols and Chromosols.	Eucalypt woodland. Narrow-leaved ironbark, silver-leaved ironbark, Queensland blue gum, Moreton Bay ash and pink bloodwood.	VI m6, pd2-3, nd3, e3
LU3	10	Upper slopes, 3-5%. Rock outcrop common.	Shallow to moderately deep, brown, uniform, coarse textured soils with hardsetting surfaces; loamy coarse sand, medium A horizons; coarse sand B horizons; rock fragments throughout profile; acid soil reaction trend. Orthic Tenosols.	Eucalypt open woodland. Narrow-leaved ironbark and pink bloodwood.	VI-VII m6, pd2-3, nd3, r4-5, e2-3
LU4	10	Mid and lower slopes, 5-10%.	Moderately deep to deep, red and brown, sodic and non sodic duplex soils with hardsetting surfaces (some uniform coarse textured soils); coarse sand to loamy sand, thick to very thick A horizons, with bleached A2 horizons; sandy light clay B horizons; rock fragments throughout profile; acid to neutral soil reaction trend. Red and Brown Sodosols and Chromosols (some Tenosols).	Eucalypt woodland. Narrow-leaved ironbark and pink bloodwood.	VI m6, nd3, e4

CULCRAIGIE (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU5	5	Lower slopes and major drainage lines, 0-1%.	Deep, often mottled, brown and black, sodic duplex soils with hardsetting surfaces; loam to clay loam, medium to thick A horizons, with bleached A2 horizons; medium clay B horizons, often with rock fragments; alkaline soil reaction trend. Brown and Black Sodosols.	Eucalypt woodland. Queensland blue gum, silver-leaved ironbark, rough barked apple, swamp mahogany and narrow-leaved ironbark.	V1 m4 or 6, pd2-3, ps3, nd3, e4

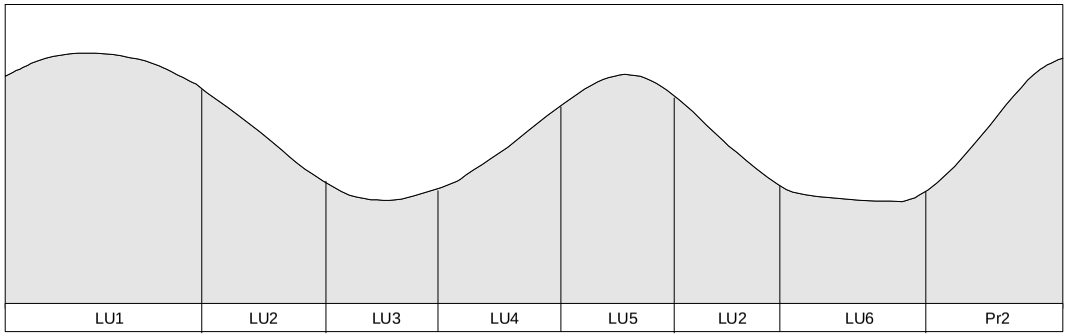
LAND SYSTEM - PERRY 1 (Pr1)

General Description: Undulating low hills to rolling low hills on acid intrusive rocks. Major soils are moderately deep to deep, grey, yellow and brown, sodic duplex soils (Sodosols and Chromosols).

Geology: Tenningering Granodiorite - Biotite granodiorite, muscovite - biotite granodiorite.

Landform: Undulating low hills to rolling low hills.

Vegetation: Eucalypt woodland to open forest, extensively to completely cleared. Narrow-leaved ironbark, spotted gum, Moreton Bay ash, Queensland blue gum, rough barked apple, bloodwoods and swamp mahogany.



Note: Perry 2 is also found within this land system

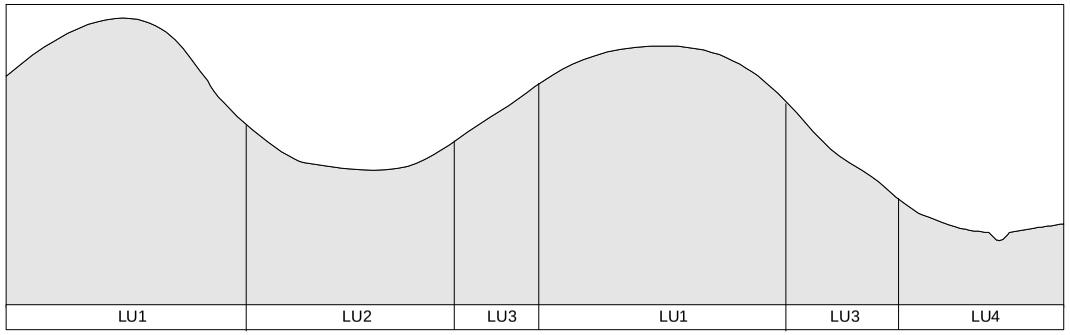
Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	30	Crests and upper slopes, 8-25%. Rock outcrop usually present.	Shallow to moderately deep, yellow and grey, sodic duplex soils with hardsetting surfaces; coarse sand to sandy loam, medium to thick A horizons, usually with bleached A2 horizons; light clay to sandy light clay B horizons, with granitic fragments throughout; acid to neutral soil reaction trend. Yellow and Grey Sodosols and Chromosols.	Eucalypt open forest to woodland. Narrow-leaved ironbark, gum topped bloodwood, spotted gum and swamp mahogany.	VI-VII m6, pd2-3, nd3, (ts6-7), r3-4, e6
LU2	35	Mid and lower slopes, 10-20%. Rock outcrop usually present.	Moderately deep to deep, mottled, grey and yellow, sodic duplex soils with hardsetting surfaces; loamy sand to sandy loam, thick A horizons, usually with bleached A2 horizons; sandy, light to light medium clay B horizons, usually with granitic fragments throughout; acid to neutral reaction trend. Yellow and Grey Sodosols and Chromosols.	Eucalypt open forest to woodland. Narrow-leaved ironbark, spotted gum, Queensland blue gum, Moreton Bay ash, rough barked apple, swamp mahogany and wattles.	VI m6, pd2, nd3, ts6, r4, e6
LU3	10	Lower slopes and broad drainage depressions, 2-6%. Seeps may develop.	Moderately deep to deep, yellow, grey and brown, sodic duplex soils with hardsetting surfaces; sand to sandy loam, thick A horizons, with bleached A2 horizons; light to light medium clay B horizons, usually with granitic fragments; acid to neutral soil reaction trend. Yellow, Grey and Brown Sodosols and Chromosols.	Eucalypt woodland. Queensland blue gum, rough barked apple and narrow-leaved ironbark.	VI m6, pd2, nd3, e6, (w5)

PERRY 1 (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU4	10	Mid slopes, 10-20%.	Moderately deep, yellow, uniform, coarse textured and gradational soils with hardsetting surfaces; coarse sand to sandy loam, thick A horizons, with bleached A2 horizons; sandy loam B horizons; granitic fragments throughout profile; acid soil reaction trend. Bleached Orthic Tenosols.	Eucalypt woodland. Moreton Bay ash, spotted gum and Queensland blue gum.	VI m6, nd3, ts6, e6
LU5	10	Crests and upper slopes, 2-10%. Surface stone often present.	Moderately deep, yellow, uniform, coarse textured and non sodic duplex soils with hardsetting surfaces; coarse sand to sandy loam, very thick A horizons, with bleached A2 horizons over decomposing granodiorite; (when present) sandy clay loam to sandy light clay B horizons; granitic fragments common throughout profile; acid soil reaction trend. Bleached-Leptic Tenosols and Yellow Chromosols.	Eucalypt woodland. Spotted gum, Moreton Bay ash and brown bloodwood.	VI m6, nd3, (r3-4), e3
LU6	5	Broad drainage depressions 0-2%. Seeps may develop.	Deep, black and grey, sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium A horizons, usually with bleached A2 horizons; light to medium clay B horizons; alkaline soil reaction trend. Black and Grey Sodosols.	Eucalypt open woodland. Queensland blue gum, Moreton Bay ash, narrow-leaved ironbark and rough barked apple.	VI m6, nd3, ps3, (w5), e3

LAND SYSTEM - RASPBERRY 1 (Rp1)

General Description: Undulating low hills to rolling low hills on acid intrusive rocks. Major soils are shallow to moderately deep, brown and red, sodic duplex soils and moderately deep to deep, brown, yellow and grey, sodic duplex soils (Chromosols and Sodosols).
Geology: Glassford Complex - Granodiorite, adamellite, tonalite.
Landform: Undulating low hills to rolling low hills.
Vegetation: Eucalypt woodland, limited to extensive clearing. Narrow-leaved ironbark, spotted gum, bloodwoods and Queensland blue gum.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	40	Crests, ridges and upper slopes, 15-25%. Rock outcrop common in some places.	Shallow to moderately deep, brown and red, sodic duplex soils with hardsetting surfaces; coarse sandy loam to sandy clay loam, medium to thick A horizons; sandy light to medium clay B horizons; neutral soil reaction trend. Brown and Red Chromosols.	Eucalypt woodland. Spotted gum, bloodwoods and narrow-leaved ironbark.	VI m6, pd2-4, nd3, ts6, r2-5, e6
LU2	30	Lower concave slopes, 3-10%.	Moderately deep to deep, mottled, brown, yellow and grey, sodic duplex soils; sandy clay loam, medium A horizons, with bleached A2 horizons; medium clay B horizons, usually with rock fragments; neutral to alkaline soil reaction trend. Brown, Yellow and Grey Sodosols.	Eucalypt woodland. Queensland blue gum and bloodwoods.	VI m6, pd4, ps3, nd3, e4
LU3	20	Midslopes, 15-25%. Rock outcrop may occur.	Shallow to moderately deep, brown and yellow, sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, medium to thick A horizons; light to medium clay B horizons, often with rock fragments; neutral soil reaction trend. Brown and Yellow Chromosols.	Eucalypt woodland. Narrow-leaved ironbark, spotted gum and bloodwoods.	VI-VII m6, pd2-4, nd3, ts6-7, r2-5, e6
LU4	10	Lower slopes and major drainage lines, 5-15% slope.	Moderately deep to deep, brown and grey, sodic duplex soils and alluvial soils with hardsetting surfaces; sand to sandy clay loam, medium to thick A horizons; sand to sandy clay B or D horizons; neutral soil reaction trend. Brown and Grey Chromosols, Orthic Tenosols and Stratic Rudosols.	Eucalypt woodland. Narrow-leaved ironbark, Queensland blue gum, spotted gum. River oaks *and Melaleucas* fringe drainage lines.	V1 m4 or 6, nd3, ts4, e6

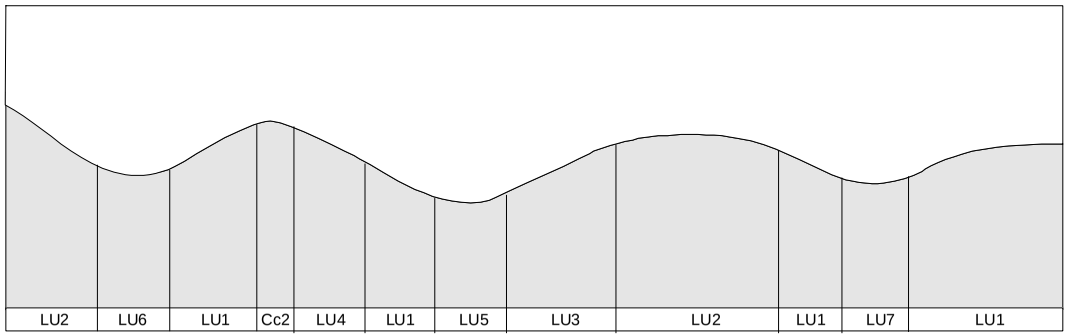
LAND SYSTEM - RAWBELLE (Rb)

General Description: Undulating low hills to rolling low hills on acid intrusive rocks. Major soils are moderately deep to deep, red, brown and yellow, non sodic and sodic duplex soils and uniform, coarse textured soils (Chromosols, Sodosols and Tenosols).

Geology: Undifferentiated Formation - Granodiorite, granite, adamellite, amphibolite.

Landform: Undulating low hills to rolling low hills.

Vegetation: Eucalypt open forest with limited clearing. Narrow-leaved ironbark, pink bloodwood, silver-leaved ironbark, spotted gum, Moreton Bay ash, red ash and wattles.



Note: Clonclose 2 is also found within this land system

LandUnit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	40	Mid and upper slopes and broad ridge crests, 3-10%. Rock outcrop and surface stone may occur.	Moderately deep to deep, usually mottled, yellow and grey, sodic duplex soils with hardsetting surfaces; fine sandy loam to loam fine sandy, medium A horizons, with bleached A2 horizons; sandy light to medium clay B horizon, with rock fragments; neutral to alkaline soil reaction trend. Yellow and Grey Sodosols and Chromosols.	Eucalypt open forest. Narrow-leaved ironbark, pink bloodwood, Queensland Blue gum, Moreton Bay ash and bulloak.	VI-VII m6, ps3, nd3, (r3-5), e2
LU2	35	Mid and upper slopes and broad ridge crests, 2-10% slope. Rock outcrop occurs in some areas.	Moderately deep, usually mottled, red, non sodic duplex soils with hardsetting surfaces; loamy sand to sandy clay loam, thick A horizons, with bleached A2 horizons; sandy, light to medium clay B horizons, usually with rock fragments; acid to neutral soil reaction trend. Red Chromosols.	Eucalypt open forest. Narrow-leaved ironbark, pink bloodwood with quinine bush, spotted gum, Moreton Bay ash and bottle trees.	VI-VII m6, nd3, (r3-5), e2
LU3	5	Mid and upper slopes, 4-8%. Rock outcrop and surface stone may occur.	Moderately deep, sometimes mottled, brown and yellow (occasionally red), non sodic and sodic duplex soils with hardsetting surfaces; loamy sand to sandy loam, thick A horizons, sometimes with bleached A2 horizons; sandy, light to medium clay B horizons, with rock fragments; acid to neutral soil reaction trend. Brown and Yellow (occasionally Red) Chromosols.	Eucalypt open woodland. Silver-leaved ironbark and Moreton Bay ash.	VI-VII m6, nd3, (r5), e2-3

RAWBELLE (continued)

LandUnit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU4	5	Upper slopes, 8-15%. Some areas up to 25% slope. Rock outcrop common in some areas.	Shallow to moderately deep, uniform, coarse textured soils over rock and brown and red, non sodic duplex soils, with hardsetting surfaces; loamy sand to sandy loam, medium to thick A horizons, occasionally with bleached A2 horizons; coarse sand to sandy clay B horizons with rock fragments; acid to neutral soil reaction trend. Orthic Tenosols and Brown and Red Chromosols.	Eucalypt open forest. Narrow-leaved ironbark, pink bloodwood, spotted gum, red ash and wattles.	VI-VII m6, pd2-3, nd3, ts4 or 6, (r4-5), e3-4 or 6
LU5	5	Lower slopes and drainage lines, 1-2% slope.	Deep, brown, black and grey, gradational and sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, thin to medium A horizons, sometimes with bleached A2 horizons; sandy, light to medium clay B horizons; alkaline soil reaction trend. Brown, Black and Grey Dermosols, Sodosols and Chromosols.	Eucalypt open forest. Rough barked apple, Queensland blue gum and Moreton Bay ash.	VI m6, pd2-3, ps3, nd3, e2
LU6	5	Lower slopes and minor drainage lines, 3-6% slope.	Deep, yellow, uniform, coarse textured soils, (occasionally duplex soils) with hardsetting surfaces; loamy sand, medium A horizons; coarse sand B horizons (occasionally sandy clay), rock fragments throughout; acid to neutral soil reaction trend. Orthic Tenosols (occasionally Yellow Chromosols).	Eucalypt open forest. Queensland blue gum, narrow-leaved ironbark, Moreton Bay ash, pink bloodwood and swamp mahogany.	VI m6, nd3, e2-3
LU7	5	Lower slopes, 3-6%.	Moderately deep, red and brown, non sodic and sodic duplex soils with hardsetting surfaces; loamy sand, thick A horizons, with bleached A2 horizons; sandy light clay B horizons; rock fragments throughout profile; acid soil reaction trend. Red and Brown Chromosols.	Eucalypt open forest. Gum topped box, beefwood and wattles.	VI m6, nd3, e2-3

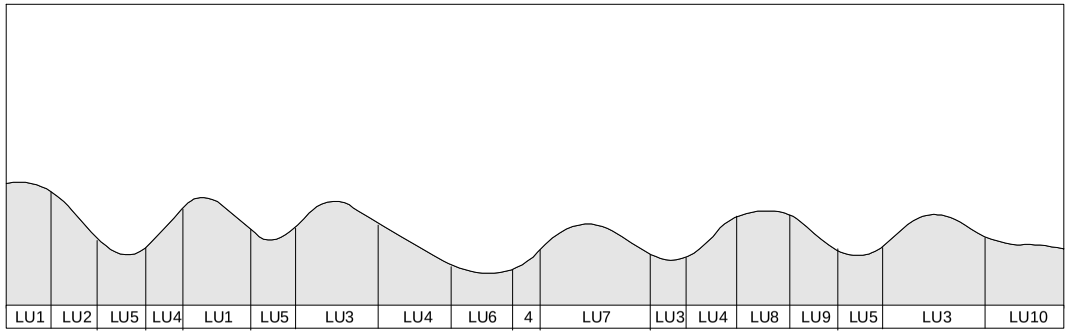
LAND SYSTEM - WINGFIELD 1 (Wf1)

General Description: Undulating low hills to rolling low hills on acid intrusive rocks. Major soils are shallow to moderately deep, red and brown, non sodic duplex soils, and moderately deep to deep, brown and grey, sodic duplex soils and uniform, coarse textured soils (Chromosols, Sodosols and Tenosols).

Geology: Wingfield Adamellite - Adamellite, granodiorite and gabbro.

Landform: Undulating low hills to rolling hills.

Vegetation: Eucalypt woodland, completely to extensively cleared. Narrow-leaved ironbark, silver-leaved ironbark, bloodwoods, Moreton Bay ash, poplar box and Queensland blue gum.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	10	Higher broad crests and upper slopes, 3-10%. Rock outcrop usually present.	Shallow to moderately deep, occasional mottled, brown and red, non sodic duplex soils with hardsetting surfaces; loamy sand to sandy clay loam, medium to thick A horizons, occasionally with bleached A2 horizons; sandy, light to medium clay B horizons, usually with few to common granitic coarse fragments; acid to neutral soil reaction trend. Brown and Red Chromosols.	Eucalypt woodland. Narrow-leaved ironbark, with minor silver-leaved ironbark, Moreton Bay ash and bloodwoods.	VI-VII m6, pd2-3, nd3, r3-5, e3-4
LU2	<5	Mid slopes, 10-30%. Usually abundant rock outcrop.	Shallow to moderately deep, brown and yellow, non sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, medium to thick A horizons, occasionally with bleached A2 horizons; sandy, light to medium clay B horizons; acid to neutral soil reaction trend. Brown and Yellow Chromosols.	Eucalypt woodland. Narrow-leaved ironbark.	VI-VII m6, pd2-3, r4-5, ts6-7, e6
LU3	30	Broad crests and upper slopes, 5-10%.	Shallow to moderately deep, occasionally mottled, brown and red, non sodic duplex soils with hardsetting surfaces; loamy sand to sandy clay loam, medium to thick A horizons, occasionally with bleached A2 horizons; light to medium clay B horizons; usually with few to many granitic coarse fragments; acid to neutral soil reaction trend. Brown and Red Chromosols.	Eucalypt woodland. Silver-leaved ironbark with minor narrow-leaved ironbark and Moreton Bay ash.	VI m6, pd2-3, nd3, e4

WINGFIELD 1 (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU4	20	Midslopes, 6-10%.	Moderately deep to deep, sometimes mottled, brown and grey, sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, medium to thick A horizons, occasionally with bleached A2 horizons; light to medium clay B horizons, usually with granitic fragments; neutral soil reaction trend. Brown and Grey Chromosols and Sodosols.	Eucalypt woodland. Silver-leaved ironbark.	VI m6, pd2-3, nd3, e3
LU5	10	Lower concave slopes and drainage lines, 3-6% slope.	Moderately deep to deep, sometimes mottled, brown and grey, sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam sandy, medium to thick A horizons, usually with bleached A2 horizons; light to medium clay B horizons, usually with granitic fragments; acid to alkaline soil reaction trend. Brown and Grey Sodosols and Chromosols.	Eucalypt woodland. Poplar box, silver-leaved ironbark and Queensland blue gum.	VI m6, pd2-3, ps3, nd3, e6
LU6	5	Major drainage lines, 2-4% slope.	Deep, grey and brown, gradational soils, sodic duplex soils and non cracking clays with hardsetting surfaces; silty clay loam to light clay, medium A horizons; light to medium clay B horizons; alkaline soil reaction trend. Grey and Brown Dermosols, Sodosols and Chromosols.	Eucalypt woodland. Queensland blue gum, poplar box and apple trees.	VI m4, pd2-3, ps3, nd3, e6
LU7	5	Broad ridges, upper and midslopes, 3-6%.	Deep, brown and yellow, sodic and non sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, medium A horizons, usually with bleached A2 horizons; medium clay B horizons; neutral to alkaline soil reaction trend. Brown and Yellow Sodosols and Chromosols.	Eucalypt woodland. Poplar box with minor silver-leaved ironbark.	VI m6, pd2-3, nd3, e2-3
LU8	10	Crests and upper slopes, 6-12%.	Deep, brown, uniform, coarse textured soils with firm to hardsetting surfaces; coarse sand to sandy loam, medium to thick A horizons, with bleached A2 horizons; clayey sand to sandy loam B horizons, with granitic rock fragments; neutral soil reaction trend. Bleached-Leptic Tenosols.	Eucalypt woodland. Narrow-leaved ironbark, bloodwoods and Moreton Bay ash.	VI m6, nd3, e3-4
LU9	5	Mid and lower slopes, 6-12%.	Deep, sometimes mottled, brown, sodic duplex soils with firm to hardsetting surfaces; coarse sand to sandy loam, very thick A horizons, sometimes with bleached A2 horizons; medium clay B horizons, usually with granitic fragments; neutral soil reaction trend. Brown Chromosols.	Eucalypt woodland. Narrow-leaved ironbark and Moreton Bay ash.	VI m6, nd3, e3-4
LU10	<5	Lower ridges and slopes bordering Hindmarsh land system, 1-5% slope.	Deep, black, brown or red, cracking and non cracking clays and sodic duplex soils with hardsetting to self mulching surfaces; clay loam to light clay, thin to medium A horizons; light to medium clay B horizons; alkaline soil reaction trend. Black, Brown and Red Vertosols, Dermosols and Chromosols.	Eucalypt woodland. Poplar box, Moreton Bay ash, silver-leaved ironbark occasionally wilga present.	III-IV m3-4, pm3, e2-3

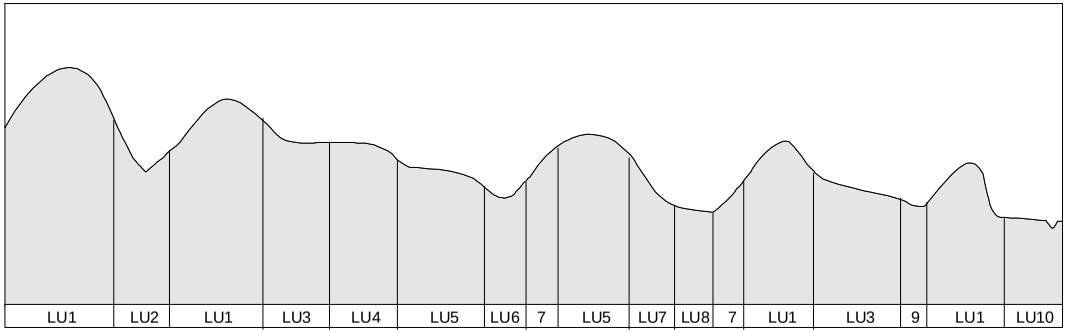
LAND SYSTEM - WONBAH (Wb)

General Description: Rolling low hills on acid to intermediate intrusive rocks. Major soils are shallow to moderately deep, red and brown, non sodic duplex soils, moderately deep to deep, brown, yellow and grey, sodic duplex soils and shallow to moderately deep, uniform, coarse textured soils (Chromosols, Rudosols and Tenosols).

Geology: Wonbah Granodiorite - Hornblende - biotite granodiorite to quartz diorite.

Landform: Rolling low hills.

Vegetation: Eucalypt open forest to woodland, usually extensively to completely cleared. Narrow-leaved ironbark, spotted gum, gum topped bloodwood, Moreton Bay ash, Queensland blue gum and wattles.



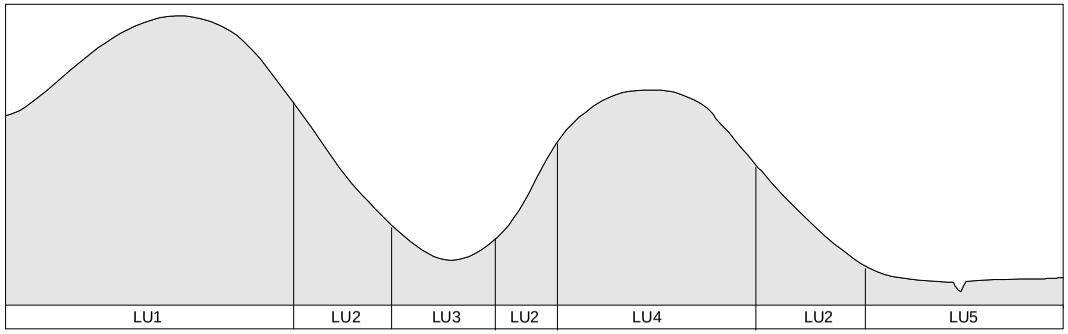
Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	25	Crests, upper and mid slopes, 10-40%. Rock outcrop common to abundant.	Shallow, red and brown, gradational and non sodic duplex soils with hardsetting surfaces; sandy loam to clay loam sandy, medium to thick A horizons, sometimes with bleached A2 horizons; light clay B horizons; granitic fragments usually throughout profile; acid to neutral soil reaction trend. Red and Brown Dermosols and Chromosols.	Eucalypt open forest to woodland. Narrow-leaved ironbark, spotted gum and wattles.	VI-VII m6, pd3-4, ps3, nd3, r3-5, ts4-7, e6-7
LU2	5	Lower concave slopes, 15-20%.	Moderately deep, often mottled, brown and yellow, sodic duplex soils with hardsetting surfaces; sandy clay loam, thick A horizons, with bleached A2 horizons; sandy light clay B horizons; granitic fragments throughout profile; acid to neutral soil reaction trend. Brown and Yellow Chromosols.	Eucalypt woodland. Spotted gum and narrow-leaved ironbark.	VI m6, pd2, ps3, nd3, ts6, e6
LU3	15	Upper slopes, 10-15%. Rock outcrop and surface coarse fragements common	Shallow to moderately deep, brown and red, non sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium A horizons; light to medium clay B horizons; neutral soil reaction trend. Brown and Red Chromosols.	Eucalypt open forest to woodland. Spotted gum, narrow-leaved ironbark, Moreton Bay ash with wattles occasionally present.	VI-VII m4 or 6, pd2-3, ps3, nd3, r4-5, e4
LU4	5	Crests and upper slopes, 5-15%. Often coarse fragments on surface.	Shallow, uniform, coarse textured soils with hardsetting surfaces over rock; sandy loam, with abundant coarse fragments, medium A horizons; acid soil reaction trend. Leptic Rudosols.	Eucalypt woodland. Spotted gum and narrow-leaved ironbark.	VI m6, pd3-4, nd3, r2-3, e6

WONBAH (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU5	20	Crests and upper slopes, 5-15%.	Shallow to moderately deep, brown and yellow, sodic duplex soils with hardsetting surfaces; sandy clay loam, medium A horizons; light clay B horizons; neutral soil reaction trend. Brown and Yellow Chromosols.	Eucalypt open forest to woodland. Narrow-leaved ironbark, gum-topped bloodwood and Moreton Bay ash.	VI m4 or 6, pd2-3, ps3, nd3, e3-4
LU6	<5	Lower concave slopes, 8-12%.	Moderately deep, uniform, coarse textured soils and brown, sodic duplex soils with hardsetting surfaces; sand to sandy clay loam, thick A horizons, with bleached A2 horizons; coarse sand to sandy light clay B horizons; granitic fragments throughout profile; neutral soil reaction trend. Bleached-Leptic Tenosols and Brown Chromosols.	Eucalypt woodland. Queensland blue gum, Moreton Bay ash and apple trees.	VI m6, nd3, e3-4
LU7	20	Midslopes, 12-20%.	Moderately deep to deep, brown, sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam sandy, medium to thick A horizons, sometimes with bleached A2 horizons; medium clay B horizons, with granitic fragments; neutral soil reaction trend. Brown Chromosols.	Eucalypt woodland. Gum-topped bloodwood, narrow-leaved ironbark with wattles occasionally present.	VI m4 or 6, ps3, nd3, ts6, e6
LU8	<5	Lower slopes and drainage depressions, 1-5%. Seep and scalded areas may be present.	Moderately deep to deep, grey, sodic duplex and gradational soils with hardsetting surfaces; sandy clay loam to light clay, medium to thick A horizons, with bleached A2 horizons; medium clay B horizons; alkaline soil reaction trend. Grey Chromosols and Dermosols.	Eucalypt woodland. Gum topped bloodwood, narrow-leaved ironbark and Queensland blue gum.	VI m4 or 6, pd2-3, ps3, nd3, (sa6), (w5)
LU9	<5	Lower slopes and drainage lines, 2-6% slope.	Deep, grey and brown, non cracking clays with hardsetting surfaces; light to light medium clay, thin to medium A horizons; medium clay B horizons; neutral to alkaline soil reaction trend. Grey and Brown Dermosols.	Eucalypt woodland. Queensland blue gum and Moreton Bay ash.	IV m3, ps3, nd3, e4
LU10	<5	Lower slopes and major drainage lines, 1-5% slope.	Deep, grey, often mottled, sodic duplex soils with hardsetting surfaces; sand to sandy clay loam, thick A horizons, with bleached A2 horizons; sandy light clay B horizons; sandy D horizons may be present; neutral soil reaction trend. Grey Chromosols.	Eucalypt open forest. Queensland blue gum, apple trees and Moreton Bay ash.	VI m6, pd2-3, nd3, e4

LAND SYSTEM - NOUR (Nr)

General Description: Rolling low hills on acid intrusive rocks. Major soils are shallow to deep, red, brown and yellow, sodic and non sodic duplex soils and shallow, uniform, coarse and medium textured soils over rock (Chromosols and Rudosols).
Geology: Nour Nour Granodiorite - Biotite - hornblende granodiorite, hornblende - biotite granodiorite.
Landform: Rolling low hills.
Vegetation: Eucalypt woodland, usually completely cleared. Narrow-leaved ironbark, spotted gum, silver-leaved ironbark, Queensland blue gum and Moreton Bay ash.



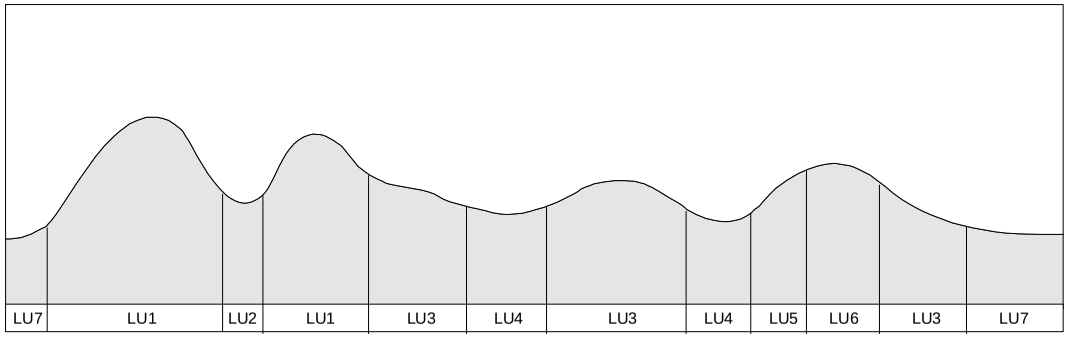
Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	15	Crests and upper slopes, 5-20%. Rock outcrop may be present.	Shallow, coarse and medium textured soils over rock, and red and brown, non sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, medium to thick A horizons; (if present) light clay B horizons; acid to neutral soil reaction trend. Leptic Rudosols and Red and Brown Chromosols.	Eucalypt woodland. Narrow-leaved ironbark, Moreton Bay ash and spotted gum.	VI m6, pd3-4, nd3, ts4 or 6, (r4), e4 or 6
LU2	40	Midslopes, 12-20%. Rock outcrop may be present.	Moderately deep to deep, brown and yellow, non sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, thick to very thick A horizons, with bleached A2 horizons; light to medium clay B horizons; neutral soil reaction trend. Brown and Yellow Chromosols.	Eucalypt woodland. Narrow-leaved ironbark, Queensland blue gum and Moreton Bay ash.	VI m4, nd3, ts6, r1-4, e6
LU3	15	Lower slopes, 10-15%.	Deep, often mottled, brown and yellow, sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, thick A horizons, with bleached A2 horizons; medium clay B horizons with granitic fragments; neutral soil reaction trend. Brown and Yellow Sodosols and Chromosols.	Eucalypt woodland. Queensland blue gum, spotted gum, Moreton Bay ash and narrow-leaved ironbark.	VI m6, nd3, ts4, e6
LU4	25	Crests and upper slopes, 12-20%. Rock outcrop may be present.	Shallow to moderately deep, brown and red, non sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, medium to thick A horizons, occasionally with bleached A2 horizons; light to medium clay B horizons with granitic fragments; neutral soil reaction trend. Brown and Red Chromosols.	Eucalypt woodland. Narrow-leaved and silver-leaved ironbark.	VI m6, nd3, pd2-3, ts6, r1-4, e6

NOUR (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU5	5	Lower slopes and drainage depressions, 5-10%. Seepages may occur.	Moderately deep to deep, brown, yellow and grey, sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium A horizons, with bleached A2 horizons; medium clay B horizons with granitic fragments; alkaline soil reaction trend. Brown, Yellow and Grey Sodosols and Chromosols.	Eucalypt woodland. Queensland blue gum and Moreton Bay ash, *Casuarina* species fringe drainage lines.	V1 m6, pd3, ps3, (w4), e4

LAND SYSTEM - EIDSVOLD (Ev)

General Description: Rolling low hills to steep low hills on acid intrusive rocks. Major soils are shallow to moderately deep, red, brown and yellow, non sodic and sodic duplex soils and gradational soils (Chromosols, Sodosols and Dermosols).
Geology: Eidsvold Complex - Granite, granodiorite, quartz gabbro.
Landform: Rolling low hills to steep low hills with minor undulating low hills.
Vegetation: Eucalypt woodland, extensive to limited clearing. Narrow-leaved ironbark, spotted gum, bloodwoods, Moreton Bay ash and silver-leaved ironbark.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	40	Crests, upper and midslopes, 20-40%, some as steep as 60%. Boulder and stone outcrop common.	Shallow, red, non sodic duplex soils with hardsetting surfaces; loamy sand to sandy clay loam, thick A horizons; sandy light clay B horizons; acid to neutral soil reaction trend. Red Chromosols.	Eucalypt woodland. Narrow-leaved ironbark, spotted gum, silver-leaved ironbark and bloodwoods.	VII-VIII m6, pd3, nd3, ts7-8, r5, e7
LU2	5	Lower concave slopes, 5-10%. Rock outcrop may be present.	Shallow, brown and yellow, non sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, thick A horizons; sandy light clay B horizons; acid to neutral soil reaction trend. Brown and Yellow Chromosols.	Eucalypt woodland. Narrow-leaved ironbark, silver-leaved ironbark and Moreton Bay ash.	VI-VII m6, pd3, ps3, nd6, (r4-5), e6
LU3	15	Crests, upper and midslopes, 8-15%. Rock outcrop may be present.	Shallow to moderately deep, red, sodic duplex and gradational soils with hardsetting surfaces; sandy loam to clay loam, medium to thick A horizons, sometimes with bleached A2 horizons; sandy, light to medium clay B horizons; neutral soil reaction trend. Red Chromosols, Sodosols and Dermosols.	Eucalypt woodland. Moreton Bay ash, narrow-leaved and silver-leaved ironbark.	VI m4 or 6, pd3-4, ps3, nd3, (r3-4), e6
LU4	10	Lower slopes and drainage lines, 4-8%.	Moderately deep, brown and yellow, sodic duplex and gradational soils with hardsetting surfaces; sandy clay loam to clay loam, medium A horizons, occasionally with bleached A2 horizons; light to light medium clay B horizons; neutral to alkaline soil reaction trend. Brown and Yellow Sodosols and Dermosols.	Eucalypt woodland. Silver-leaved ironbark, Moreton Bay ash and narrow-leaved ironbark.	VI m6, pd2-3, ps3, nd3, e6

EIDSVOLD (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU5	10	Midslopes, 5-12%.	Moderately deep to deep, brown and yellow, sodic and non sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, medium to thick A horizons, occasionally with bleached A2 horizons; light to light medium clay B horizons; neutral to alkaline soil reaction trend. Brown and Yellow Chromosols and Sodosols.	Eucalypt woodland. Narrow-leaved ironbark, bloodwoods and Moreton Bay ash.	VI m4 or 6, pd2-3, nd3, e6
LU6	10	Crests and upper slopes, 6-12%. Rock outcrop often present.	Shallow to moderately deep, brown and yellow, non sodic and sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, medium A horizons, occasionally with bleached A2 horizons; light clay to light medium clay B horizons, usually with rock fragments throughout; neutral to alkaline soil reaction trend. Brown and Yellow Chromosols.	Eucalypt woodland. Narrow-leaved ironbark, bloodwoods, Moreton Bay ash and wattles.	VI m4 or 6, pd2-3, nd3, (r3-4), e6
LU7	10	Lower slopes, 2-5%.	Deep, black, non cracking clays and gradational soils with hardsetting surfaces; clay loam to light clay, medium A horizons; light to medium clay B horizons; neutral to alkaline soil reaction trend. Black Dermosols.	Eucalypt open woodland. Queensland blue gum, silver-leaved ironbark, Moreton Bay ash and narrow-leaved ironbark.	III m3, ps3, e2-3

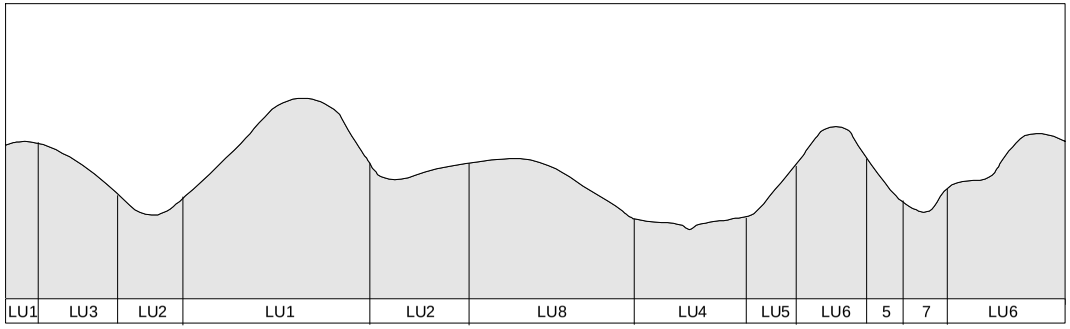
LAND SYSTEM - BRIGGS 2 (Br2)

General Description: Rolling hills to steep hills on acid intrusive rocks. Major soils are shallow to deep, brown, yellow and grey, sodic duplex soils, and red and brown, gradational soils and non cracking clays (Chromosols and Dermosols).

Geology: Briggs and Yenda Granodiorite - Biotite - hornblende granodiorite, hornblende granite to granodiorite, tonalite.

Landform: Rolling low hills to steep hills.

Vegetation: Eucalypt open forest to woodland, extensively to completely cleared. Narrow-leaved ironbark, spotted gum, bloodwoods, Queensland blue gum, Moreton Bay ash and apple trees.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	35	Crests and upper to midslopes, 10-40%. Rock outcrop common to abundant.	Shallow to moderately deep, brown and yellow, sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, thick A horizons, usually with bleached A2 horizons; sandy, light to medium clay B horizons; neutral soil reaction trend. Brown and Yellow Chromosols.	Eucalypt open forest. Spotted gum and narrow-leaved ironbark.	VI-VII m6, pd2-3, nd3, ts6-7, r3-5, e6-7
LU2	5	Lower concave slopes, 10-20%.	Moderately deep, (sometimes mottled), brown and grey, sodic duplex soils with hardsetting surfaces; sandy loam to clay loam sandy, thick A horizons; sandy, light to medium clay B horizons, with granitic fragments; neutral soil reaction trend. Brown and Grey Chromosols.	Eucalypt open forest to woodland. Queensland blue gum, bloodwoods, Moreton Bay ash, swamp mahogany, narrow-leaved ironbark, spotted gum and apple trees.	VI m6, pd2-3, ps3, nd3, ts6, e6
LU3	20	Midslopes, 15-20%.	Moderately deep to deep, brown and yellow, sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, thick A horizons, with bleached A2 horizons; sandy light to medium clay B horizons; neutral soil reaction trend. Brown and Yellow Chromosols.	Eucalypt open forest. Narrow-leaved ironbark, bloodwoods and Queensland blue gum.	VI m6, pd2-3, nd3, ts6, e6
LU4	<5	Lower slopes and drainage lines, 2-5%.	Moderately deep to deep, often mottled, grey and brown, sodic duplex soils with hardsetting surfaces; loam to clay loam, medium A horizons, with bleached A2 horizons; medium clay B horizons; alkaline soil reaction trend. Grey and Brown Sodosols.	Eucalypt woodland. Queensland blue gum, Moreton Bay ash, swamp mahogany. River oak and *Melaleuca* species fringe the major drainage lines.	VI m6, pd4, ps3, nd3, sa3-4, e4

BRIGGS 2 (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU5	10	Midslopes 20-30%. Rock outcrop and surface gravel may be present.	Moderately deep to deep, red and brown, sodic duplex soils, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons; light to medium clay B horizons; neutral to alkaline soil reaction trend. Red and Brown Chromosols and Dermosols.	Eucalypt woodland. Narrow-leaved ironbark and bloodwoods.	VI-VII m3-4, ps3, ts6-7, r2-5, e6
LU6	10	Crests and upper slopes, 15-30%. Rock outcrop common to abundant.	Shallow to moderately deep, red and brown, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons, often with gravel; light to medium clay B horizons; neutral soil reaction trend. Red and Brown Dermosols.	Eucalypt woodland. Narrow-leaved ironbark, bloodwoods, wattles and “softwood scrub” species.	VI-VII m4, ps3, ts6-7, r4-5, e6
LU7	<5	Lower slopes and drainage lines, 5-15%.	Moderately deep to deep, mottled, brown and yellow, gradational and sodic duplex soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons, sometimes with bleached A2 horizons; light to medium clay B horizons with granitic fragments; alkaline soil reaction trend. Brown and Yellow Chromosols and Dermosols.	Eucalypt woodland. Queensland blue gum, Moreton Bay ash and apple trees. River oak and melaleuca species fringe major drainage lines.	VI m4, ps3, t6-7, e6
LU8	10	Broad ridges, crests, upper and midslopes, 5-10%. Rock outcrop may be present.	Shallow to moderately deep, brown, sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, medium to thick A horizons; sandy, light to medium clay B horizons, with granitic fragments; neutral soil reaction trend. Brown Chromosols.	Eucalypt woodland. Narrow-leaved ironbark, bloodwoods, occasionally bottle trees present.	VI m6, pd3-4, nd3, r1-4, e6

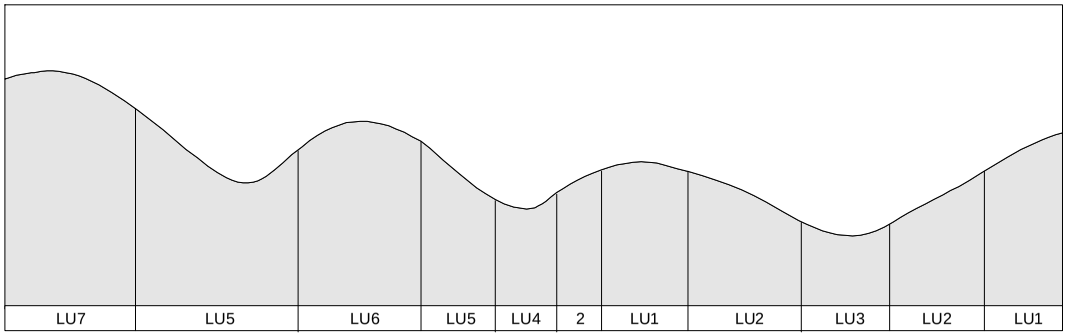
LAND SYSTEM - GAETA (Gt)

General Description: Rolling low hills to steep hills on acid intrusive rocks. Major soils are shallow to moderately deep, brown and red, non sodic duplex soils and uniform, coarse textured soils and moderately deep to deep, sodic duplex soils (Chromosols, Tenosols and Sodosols).

Geology: Miriam Vale Granodiorite - Granodiorite, tonalite and diorite.

Landform: Rolling low hills to steep hills.

Vegetation: Eucalypt shrubby open forest to woodland with limited clearing. Spotted gum, lemon scented gum, narrow-leaved ironbark, brush box, bloodwoods, minor Moreton Bay ash and Queensland blue gum with *Casuarina* and *Acacia* species understory.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	20	Lower hill crests and ridges and upper slopes, 3-6%. Rock outcrop common to abundant.	Shallow, brown and red, non sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, medium to thick A horizons; sandy, light to light medium clay B horizons; acid soil reaction trend. Brown and Red Chromosols.	Eucalypt shrubby woodland. Spotted gum, lemon scented gum, narrow-leaved ironbark, brush box and wattles.	VI-VII m6, pd2-3, nd3, r4-5, e3
LU2	5	Mid slopes, 10-25%. Rock outcrop may be present.	Shallow, brown, non sodic and sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, medium to thick A horizons, often with bleached A2 horizons; sandy, light clay to light medium clay B horizons; acid soil reaction trend. Brown Chromosols.	Eucalypt shrubby woodland. Spotted gum, lemon scented gum, narrow-leaved ironbark, brush box and wattles.	VI-VII m6, pd2-3, nd3, (r4), e6-7
LU3	10	Lower slopes and drainage lines, 3-6%.	Moderately deep to deep, usually mottled, grey, sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam sandy, thick A horizons, with bleached A2 horizons; sandy medium clay B horizons with many granitic fragments; acid soil reaction trend. Grey Chromosols and Sodosols.	Eucalypt shrubby woodland. Spotted gum, lemon scented gum, swamp mahogany, brush box and wattles.	VI m6, pd2-3, ps3, nd3, e6
LU4	5	Lower slopes and drainage lines, 2-5% slopes.	Deep, usually mottled, black and grey, sodic duplex soils with hardsetting surfaces; clay loam, medium A horizons, with bleached A2 horizons; medium clay B horizons; alkaline soil reaction trend. Black and Grey Sodosols.	Eucalypt open woodland. Queensland blue gum, rough barked apple and Moreton Bay ash.	VI m6, pd3-4, ps3, nd3, e3

GAETA (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU5	20	Mid and lower slopes, 20-50%.	Moderately deep, uniform, coarse textured soils over decomposing rock, and brown, non sodic duplex soils with hardsetting surfaces; sand to sandy loam, thick to very thick A horizons, usually with bleached A2 horizons; (if present) sandy clay loam to light clay B horizons, with many granitic fragments; acid to neutral soil reaction trend. Bleached Tenosols and Brown Chromosols.	Eucalypt shrubby woodland. Bloodwoods, lemon scented gum, narrow-leaved ironbark and *Casuarina* species.	VI-VII m6, nd3, ts6-7, e6-7
LU6	15	Crests and upper slopes, 5-15%. Rock outcrop common to abundant.	Shallow to moderately deep, uniform, coarse textured soils over decomposing rock, and brown and red, non sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, thick A horizons; (if present) sandy clay B horizons with many granitic fragments; acid soil reaction trend. Leptic Tenosols and Brown and Red Chromosols.	Eucalypt shrubby woodland. Bloodwoods, lemon scented gum, spotted gum with *Casuarina* species and wattles.	VI-VII m6, pd2-3, nd3, r3-5, e4 or 6
LU7	5	Higher crests and upper slopes, 40-60%	Shallow to moderately deep, red, gradational soils with hardsetting surfaces; sandy loam to sandy clay loam, medium to thick A horizons; sandy clay loam to clay loam coarse sandy B horizons, with many granitic fragments; acid soil reaction trend. Red Dermosols.	Eucalypt shrubby woodland. Lemon scented gum, narrow-leaved ironbark, bloodwoods, brush box, *Casuarina* species and zamia.	VII-VIII m6, pd2-3, nd3, ts7-8, e7-8

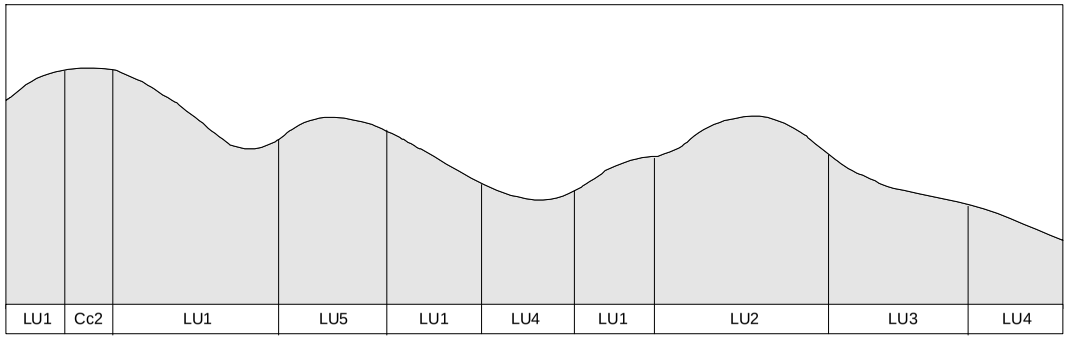
LAND SYSTEM - BOOLGAL (Bg)

General Description: Undulating hills to rolling hills on acid intrusive rocks. Major soils are very shallow to shallow, uniform, coarse textured soils over rock (Rudosols and Tenosols).

Geology: Boolgal Granite and Kilbeggan Adamellite - Granite, adamellite, minor granodiorite and diorite.

Landform: Undulating hills to rolling hills.

Vegetation: Eucalypt shrubby woodland to open woodland with limited clearing. Narrow-leaved ironbark, bloodwoods, silver-leaved ironbark, rusty gum, thready bark she-oak, red ash, budgeroo, quinine and grasstrees.



Note: Clonclose 2 is also found within this land system

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	45	Mid and lower slopes, 20-35% with some slopes up to 45%. Rock outcrop very abundant.	Very shallow, brown and black, uniform, coarse textured soils with hardsetting surfaces over rock; loamy sand, thin to medium A horizons; acid soil reaction trend. Leptic Rudosols.	Eucalypt shrubby open woodland. Bloodwoods, thready-bark she oak, grasstrees, red ash, wattles, *Grevillea* species and spinifex.	VII-VIII m6, pd4 or 6, nd3, ts7-8, r5, e7
LU2	35	Ridge crests and upper slopes, 10-30% with some slopes as steep as 45%. Rock outcrop very abundant.	Very shallow, brown and black, uniform, coarse textured soils with hardsetting surfaces over rock; sandy loam, thin to medium A horizons, with rock fragments; acid soil reaction trend. Leptic Rudosols.	Eucalypt shrubby open woodland. Narrow-leaved ironbark, yellow bloodwood with lancewood, budgeroo, other acacia species and red ash.	VII m6, pd4 or 6, nd3, ts6-7, r5, e7
LU3	10	Mid and upper slopes, 5-10% with some slopes as steep as 15%. Rock outcrop common.	Shallow to moderately deep, brown, uniform, coarse textured soils with hardsetting surfaces; loamy coarse sand to sandy loam, medium to thick A horizons; coarse sand to sandy loam B horizons; rock fragments throughout profile; acid to neutral soil reaction trend. Orthic Tenosols.	Eucalypt shrubby woodland. Narrow-leaved ironbark, rusty gum, pink bloodwood, quinine, grasstrees and red ash.	VI-VII m6, pd3-4, nd3, r3-5, e4 or 6
LU4	5	Lower slopes and minor drainage lines, 3-6% slope. Rock outcrop may be present.	Moderately deep, often mottled, grey and yellow, sodic duplex soils with hardsetting surfaces; loamy sand to sandy loam, thick A horizons, with bleached A2 horizons; sandy, light to medium clay B horizons with rock fragments; acid to neutral soil reaction trend. Grey and Yellow Chromosols and Sodosols.	Eucalypt open forest. Silver-leaved ironbark, narrow-leaved ironbark, Queensland blue gum, Moreton Bay ash and grasstrees.	VI-VII m6, nd3, (r5), e4

BOOLGAL (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU5	5	Ridge crests, 2-4% slope. Rock outcrop and surface stone common.	Shallow to very shallow, brown, uniform, coarse textured soils with hardsetting surfaces; sand to sandy loam, medium to thick A horizons; (if present) sandy loam B horizons; rock fragments usually throughout; acid soil reaction trend. Leptic Rudosols and Orthic Tenosols.	Eucalypt shrubby open woodland. Bloodwoods , thready bark she-oak, narrow-leaved ironbark and wattles.	VII m6, pd4 or 6, nd3, r5, e6

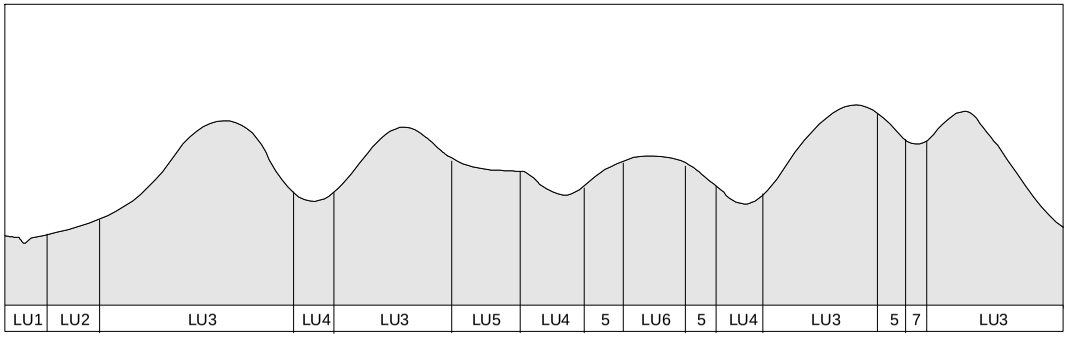
LAND SYSTEM - HOGBACK (Hb)

General Description: Rolling hills to steep hills on acid intrusive rocks. Major soils are shallow to deep, uniform, coarse textured and non sodic duplex soils (Tenosols, Kandosols and Chromosols).

Geology: Hogback Granite - Biotite granite, hornblende-biotite granite.

Landform: Rolling hills to steep hills.

Vegetation: Eucalypt open forest to woodland, limited to extensive clearing. Narrow-leaved ironbark, spotted gum, bloodwoods, Queensland blue gum and Moreton Bay ash.



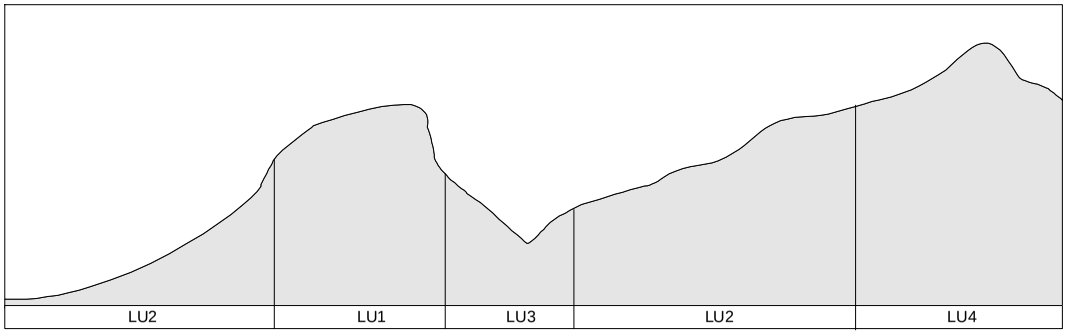
Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	<5	Major drainage depressions, 1-3%. Surface rock present in places.	Shallow to deep, alluvial soils with hardsetting surfaces; sand to sand clay loam, medium A horizons; sand to sandy light clay D horizons; acid to neutral soil reaction trend. Leptic Rudosols.	Eucalypt open forest. Queensland blue gum, Moreton Bay ash, narrow-leaved ironbark with river oaks and *Melaleuca* species fringing major creeks.	VI m6, nd3, (r3-4), e6, f4
LU2	5	Lower slopes, 6-12%.	Moderately deep to deep, uniform, coarse textured soils, and brown and yellow, gradational soils with loose to hardsetting surfaces; sand to sandy loam, thick A horizons, usually with bleached A2 horizons; sandy loam to sandy clay loam B horizons; acid to neutral soil reaction trend. Bleached Orthic Tenosols and Brown and Yellow Kandosols.	Eucalypt open forest. Bloodwoods, spotted gum, narrow-leaved ironbark often with *Casuarina* species and grass trees.	VI m6, nd3, e3-4
LU3	50	Crests and upper slopes, 30-50%. Rock outcrop common to abundant.	Shallow to moderately deep, uniform, coarse textured soils, and brown, yellow and red, gradational soils with loose to firm surfaces; coarse sand to sandy loam, thick to very thick A horizons; sandy loam to sandy clay loam B horizons; gravel may be present in profile; acid to neutral soil reaction trend. Orthic Tenosols and Brown, Yellow and Red Kandosols.	Eucalypt open forest. Narrow-leaved ironbark, spotted gum, bloodwoods, often with *Casuarina* species and wattles.	VII-VIII m6, nd2, nd3, ts7-8, r5, e7

HOGBACK (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU4	10	Lower slopes, 5-15%. Rock outcrop common.	Moderately deep to deep, occasionally mottled, uniform, coarse textured soils, and brown, yellow and grey, non sodic duplex and gradational soils with loose to firm surfaces; coarse sand to sandy clay loam, thick to very thick A horizons, often with bleached A2 horizons; coarse sand to coarse sandy light clay B horizons; acid to neutral soil reaction trend. Orthic Tenosols and Brown, Yellow and Grey Kandosols and Chromosols.	Eucalypt forest to woodland. Narrow-leaved ironbark, Moreton Bay ash, bloodwoods and silver-leaved ironbark.	VI-VII m6, nd3, r3-5, e6
LU5	15	Midslopes, 10-20%. Rock outcrop common.	Shallow to deep, brown and yellow, uniform, coarse textured soils and gradational soils with loose to firm surfaces; coarse sand to sandy clay loam, medium to thick A horizons, often with bleached A2 horizons; coarse sand to sandy clay loam B horizons; acid to neutral soil reaction trend. Orthic Tenosols and Brown and Yellow Kandosols.	Eucalypt forest. Narrow-leaved ironbark, spotted gum, bloodwoods, occasionally with Queensland blue gum, red ash, wattles and bottle trees.	VII m6, pd2-3, nd3, ts6, r5, e4-6
LU6	15	Crests and upper slopes, 3-15%. Rock outcrop common.	Shallow to moderately deep, brown and red, uniform, coarse textured soils and gradational soils with loose to firm surfaces; coarse sand to sandy loam, thick to very thick A horizons, often with bleached A2 horizons; sandy loam to sandy clay loam B horizons; acid to neutral soil reaction trend. Bleached Orthic Tenosols and Brown and Red Kandosols.	Eucalypt forest. Narrow-leaved ironbark, spotted gum and bloodwoods.	VI-VII m6, pd2-3, nd3, r3-5, e2-4
LU7	<5	Drainage depressions. Seeps may be present.	Deep, mottled, grey, non sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, thick A horizons, with bleached A2 horizons; sandy light clay B horizons; acid soil reaction trend. Grey Chromosols.	Shrubland. *Melaleuca* species.	V pd3, nd3, w5

LAND SYSTEM - PERRY 2 (Pr2)

General Description: Rolling hills to steep hills on acid intrusive rocks. Major soils are shallow to deep, grey, yellow and brown, sodic duplex soils and uniform, coarse textured soils (Sodosols, Chromosols and Tenosols).
Geology: Tenningering Granodiorite - Biotite granodiorite, muscovite - biotite granodiorite.
Landform: Rolling hills to steep hills.
Vegetation: Eucalypt open forest, limited to extensively cleared. Narrow-leaved ironbark, spotted gum, Moreton Bay ash, bloodwoods and swamp mahogany.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	20	Crests and upper slopes, 10-30%. Rock outcrop common.	Shallow to moderately deep, yellow and grey, sodic duplex soils with hardsetting surfaces; coarse sand to sandy loam; medium to thick A horizons, often with bleached A2 horizons; light clay to sandy light clay B horizons, with granite fragments throughout; acid to neutral soil reaction trend. Yellow and Grey Sodosols and Chromosols.	Eucalypt open forest. Narrow-leaved ironbark, bloodwoods, spotted gum, wattles and swamp mahogany.	VI-VII m6, pd2-3, nd3, ts6-7, r3-5, e6
LU2	50	Mid slopes, 20-50%. Rock outcrop may be present.	Shallow to deep, grey and yellow, sodic duplex soils with hardsetting surfaces; loamy sand to sandy loam, medium to thick A horizons, usually with bleached A2 horizons; sandy, light clay to medium clay B horizons; granitic fragments throughout profile; neutral to acid soil reaction trend. Grey and Yellow Sodosols and Chromosols.	Eucalypt open forest. Narrow-leaved ironbark, spotted gum, Moreton Bay ash, wattles and swamp mahogany.	VII-VIII m6, pd2-3, nd3, ts7-8, r1-4, e6-7
LU3	10	Lower slopes and drainage depressions, higher in the landscape, 8-25% slope.	Moderately deep to deep, yellow and brown, sodic duplex soils with hardsetting surfaces; sand to sandy loam, medium to thick A horizons, usually with bleached A2 horizons; light clay to medium clay B horizons; granitic fragments often throughout the profile; acid to neutral soil reaction trend. Yellow and Brown Sodosols and Chromosols.	Eucalypt open forest. Narrow-leaved ironbark, spotted gum, Moreton Bay ash and wattles.	VI m6, pd2-3, nd3, ts6-7, e6
LU4	20	Crests and upper slopes, 15-30%. Surface stone usually present.	Moderately deep, uniform, coarse textured soils over decomposing granodiorite, and yellow sodic duplex soils with hardsetting surfaces; coarse sand to sandy loam, very thick A horizons, with bleached A2 horizons; (when present) sandy clay loam to sandy light clay B horizons; granitic fragments common throughout profile; acid soil reaction trend. Bleached-Leptic Tenosols and Yellow Sodosols.	Eucalypt open forest. Spotted gum, Moreton Bay ash, bloodwoods and narrow-leaved ironbark.	VI-VII m6, nd3, ts6-7, r2-4, e6-7

LAND SYSTEM - RASPBERRY 2 (Rp2)

General Description: Rolling hills to steep hills on acid intrusive rocks. Major soils are shallow to moderately deep, red, brown and yellow, non sodic duplex soils and uniform, coarse textured soils (Chromosols and Rudosols).
Geology: Glassford Complex - Granodiorite, adamellite, tonalite.
Landform: Rolling hills to steep hills.
Vegetation: Eucalypt open forest to woodland with limited clearing. Narrow-leaved ironbark, spotted gum and bloodwoods.

LandUnit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	60	Crests, ridges and steep slopes, 30-50%. Surface stone and rock outcrop common.	Shallow to moderately deep, brown, yellow and red, non sodic duplex soils, and uniform coarse textured soils with hardsetting surfaces; coarse sandy loam to sandy clay loam, medium to thick A horizons; (if present) sandy clay B horizons; rock fragments usually present through profile; acid neutral soil reaction trend. Brown, Yellow and Red Chromosols and Leptic Rudosols.	Eucalypt open forest. Narrow-leaved ironbark, spotted gum, gum topped bloodwood and grass trees.	VII-VIII m6, nd3, t7-8, r3-5, e7-8
LU2	15	Lower slopes and drainage lines, 5-20% slope.	Brown and black, alluvial soils with hardsetting surfaces; sand to sandy clay loam, medium A horizons; sand to sandy clay loam D horizons; acid to neutral soil reaction trend. Stratic Rudosols.	Eucalypt open forest to woodland. Queensland blue gum, spotted gum, narrow-leaved ironbark, apple trees. River oak and *Melaleuca* species fringe drainage lines.	VI-VII m6, nd3, ts6, e6-7
LU3	25	Crests, lower ridges and upper slopes, 15-25%. Rock outcrop common in some places.	Shallow to moderately deep, brown and red, non sodic duplex soils with hardsetting surfaces; coarse, sandy loam to sandy clay loam, medium to thick A horizons; sandy light clay B horizons; neutral soil reaction trend. Brown and Red Chromosols.	Eucalypt woodland. Spotted gum, bloodwoods and narrow-leaved ironbark.	VI-VII m6, pd2-4, ts6-7 r3-5, e6

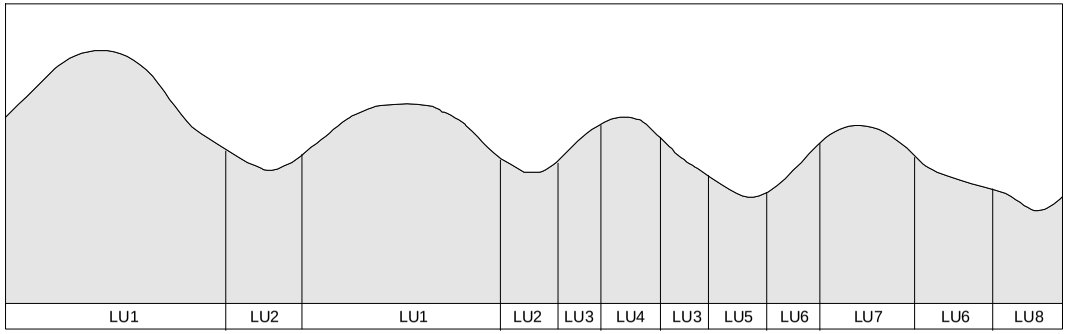
LAND SYSTEM - WOLCA (Wc)

General Description: Rolling hills to steep hills on acid intrusive rocks. Major soils are shallow to moderately deep, red, brown and yellow, non sodic duplex soils (Chromosols).

Geology: Wolca Granite.

Landform: Rolling hills to steep hills.

Vegetation: Eucalypt open forest and woodland, usually completely cleared. Narrow-leaved ironbark, spotted gum, gum topped bloodwood and Moreton Bay ash, minor wattles and "softwood scrub".



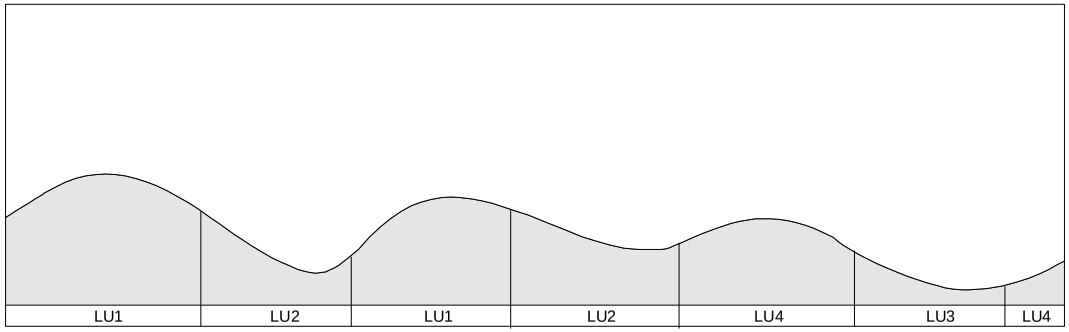
Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	25	Crests and upper to mid slopes, 15-40%. Abundant rock outcrop usually present.	Shallow, red, non sodic duplex soils with hardsetting surfaces; sandy loam, thick A horizons, often with bleached A2 horizons; light clay B horizons; granitic fragments throughout profile; neutral soil reaction trend. Red Chromosols.	Eucalypt open forest to woodland. Narrow-leaved ironbark, spotted gum with wattles often present.	VII m6, pd3, nd3, ts6-7, r5, e6-7
LU2	<5	Lower concave slopes, 15-25%.	Moderately deep, often mottled, brown and yellow, sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, thick A horizons, usually with bleached A2 horizons; sandy light clay B horizons; granitic fragments throughout profile; acid to neutral soil reaction trend. Brown and Yellow Chromosols.	Eucalypt open forest to woodland. Narrow-leaved ironbark and spotted gum.	VI-VII m6, pd2, nd3, ts6-7, e6-7
LU3	20	Midslopes, 15-30%. Some rock outcrop.	Moderately deep to deep, red, non sodic duplex and gradational soils with hardsetting surfaces; sandy loam to clay loam, medium to thick A horizons, often with bleached A2 horizons; sandy clay B horizons; granitic fragments throughout profile, acid to neutral soil reaction trend. Red Chromosols and Dermosols.	Eucalypt open forest. Narrow-leaved ironbark, gum topped bloodwood, Moreton Bay ash, spotted gum, rusty gum with bottle tree and wattles sometimes associated.	VI-VII m4 or 6, ps3, nd3, ts6, r1-3, e6

WOLCA (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU4	20	Crests and upper slopes, 5-25%. Rock outcrop common in places.	Shallow to moderately deep, red and brown, non sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam sandy, medium A horizons, sometimes with bleached A2 horizons; light clay to light medium clay B horizons; often granitic fragments throughout; acid to neutral soil reaction trend. Red and Brown Chromosols.	Eucalypt open forest to woodland. Narrow-leaved ironbark, silver-leaved ironbark, bloodwoods and Moreton Bay ash.	VI-VII m4 or 6, pd2-3, ps3 (ts6), r2-5, e3-6
LU5	10	Lower concave slopes, 5-15%.	Moderately deep, brown and yellow, non sodic duplex soils with hardsetting surfaces; coarse sand to sandy clay loam, thick to very thick A horizons, with bleached A2 horizons; sandy clay loam to light clay B horizons; granitic fragments common in profile; neutral soil reaction trend. Brown and Yellow Chromosols.	Eucalypt open forest to woodland. Queensland blue gum, rusty gum, narrow-leaved ironbark and bloodwoods.	VI m6, nd3, (ts4), e3-4
LU6	15	Midslopes, 15-20%. Rock outcrop may be present.	Moderately deep to deep, brown and yellow, non sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, thick A horizons, usually with bleached A2 horizons; light clay B horizons; granitic fragments common in profile; neutral soil reaction trend. Brown and Yellow Chromosols.	Eucalypt open forest to woodland. Narrow-leaved ironbark and gum topped bloodwood.	VI m6, nd3, ts6, r1-4, e6
LU7	<5	Crests and upper slopes, 10-20%. Rock outcrop often present.	Shallow to moderately deep, yellow and brown, non sodic duplex soils with hardsetting surfaces; sandy loam, medium to thick A horizons, usually with bleached A2 horizons; light to light medium clay B horizons; granitic fragments common in profile; acid to neutral soil reaction trend. Yellow and Brown Chromosols.	Eucalypt open forest. Narrow-leaved ironbark, bloodwoods, spotted gum with wattles and some other scrub species sometimes associated.	VI m6, pd2-3, nd3, ts4 or 6, r3-5, e6
LU8	<5	Lower slopes, drainage depressions and major drainage lines, 1-5%. Some rock outcrop may be present.	Moderately deep to deep, often mottled, yellow, brown and grey, sodic duplex, gradational, uniform textured and alluvial soils with hardsetting surfaces; sandy loam to clay loam, medium to thick A horizons, with bleached A2 horizons; sand to light clay B or D horizons; acid to neutral soil reaction trend. Yellow, Brown and Grey Chromosols, Sodosols, Dermosols, and Bleached-Orthic Tenosols.	Eucalypt open forest. Narrow-leaved ironbark, bloodwoods, Moreton Bay ash, Queensland blue gum with wattles sometimes associated. River oak, *Melaleuca* species and apple trees fringe drainage lines.	VI m4, ps3, nd3, (r2-4), e6, (f3)

LAND SYSTEM - EVERGREEN 1 (Eg1)

General Description: Undulating rises to rolling rises on a plateau on fresh and deeply weathered sedimentary rocks. Major soils are shallow to deep, uniform, coarse textured soils (Tenosols and Kandosols).
Geology: Evergreen Formation - Siltstone, sublabile sandstone, mudstone.
Landform: Undulating rises to rolling rises on a plateau.
Vegetation: Shrubland, extensively to completely cleared. "Softwood scrub" species.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	20	Crests and upper slopes, 5-15%. Rock outcrop may be present.	Shallow to moderately deep, red, uniform, coarse textured soils with hardsetting surfaces; loamy sand to sandy loam, medium A horizons; sandy loam B horizons; acid to neutral soil reaction trend. Orthic Tenosols.	Shrubland. Wattles, red ash and "softwood scrub" species.	VI m6, pd2-3, nd3, r1-4, e3-4
LU2	30	Mid and lower slopes, 5-10%. Watertable may be present at depth.	Moderately deep to deep, uniform, coarse textured soils with hardsetting surfaces; sand to loamy sand, thick to very thick A horizons, with bleached A2 horizons; (if present) mottled, sand to sandy loam B horizons; acid to neutral soil reaction trend. Bleached-Orthic Tenosols.	Shrubland. Wilga, wattles and "softwood scrub" species.	VI m6, nd3, (w5), e3
LU3	30	Mid and lower slopes, 5-10%. Rock outcrop may occur.	Shallow to moderately deep, red and brown, uniform, coarse textured soils with firm to hardsetting surfaces; sand to sandy loam, medium A horizons; coarse sand to coarse sandy loam B horizons; neutral to alkaline soil reaction trend. Orthic Tenosols.	Shrubland. "Softwood scrub" species.	VI m6, pd2-3, nd3, (r1-4), e3
LU4	20	Mid and upper slopes, 5-10%.	Deep, red, earthy, uniform, coarse textured soils with hardsetting surfaces; sandy loam, medium to thick A horizons; sandy loam to sandy clay loam B horizons; acid to neutral soil reaction trend. Red Kandosols.	Forest. "Softwood scrub" species.	VI m6, nd3, e3

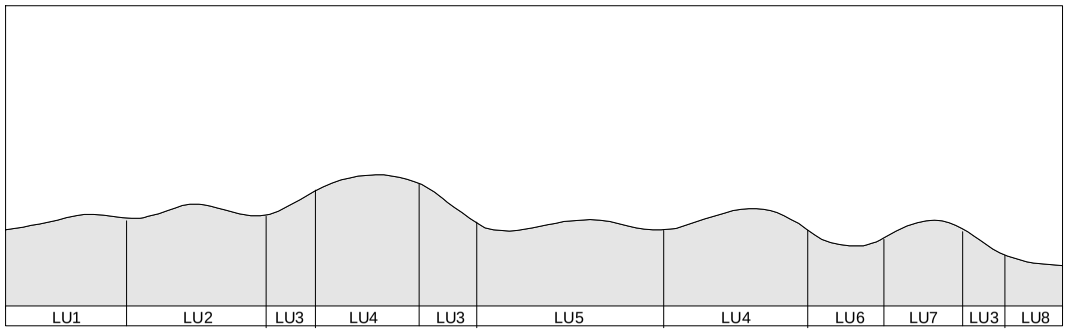
LAND SYSTEM - EVERGREEN 2 (Eg2)

General Description: Undulating low hills on fresh and deeply weathered sediments. Major soils are deep, brown, grey and black, cracking clays and shallow to moderately deep, brown and red, gradational and non cracking clays (Vertosols and Dermosols).

Geology: Evergreen Formation - Labile to sublabile sandstone, siltstone, shale and ollitic ironstone.

Landform: Undulating low hills.

Vegetation: Brigalow forest and eucalypt shrubby woodland, extensively or completely cleared. Brigalow, belah, wilga, bottle trees, "softwood scrub" species, poplar box, gum topped box, Moreton Bay ash and silver-leaved ironbark.



Land Unit	Area%	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	10	Gently undulating rises on lower slopes, 1-3%. Few stones may be present on surface.	Deep, brown and grey, cracking clays with hardsetting surfaces; light clay A horizons; light to light medium clay B horizons; alkaline soil reaction trend. Brown and Grey Vertosols.	Eucalypt shrubby open woodland. Poplar box, Moreton Bay ash, silver-leaved ironbark and wilga.	III m3, pm3, r1-2, e2
LU2	30	Gently undulating rises, 1-3% slope. Gilgai may be present.	Deep, black and grey, cracking clays with hardsetting to self mulching surfaces; light to medium, clay A horizons; medium clay B horizons, usually with rock fragments at depth; alkaline or acid soil reaction trend. Black and Grey Vertosols.	Brigalow forest. Brigalow, belah and poplar box.	III m3, pm3, tm1-2, sa2, e2
LU3	15	Midslopes, 6-10%. Rock outcrop may be present.	Deep, red and brown, gradational soils and non cracking clays with firm to hardsetting surfaces; clay loam to light clay, medium A horizons; light to medium clay B horizons, occasionally with ironstone gravel; neutral to alkaline soil reaction trend. Red and Brown Dermosols.	Brigalow forest. Brigalow and "softwood scrub" species.	III m3, ps3, r1-3, e3
LU4	10	Crests and ridges, upper and mid slopes, 8-12%. Rock outcrop may be present.	Shallow to moderately deep, brown and red, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons; light to medium clay B horizons; neutral to alkaline soil reaction trend. Brown and Red Dermosols.	Brigalow forest and eucalypt shrubby woodland. Brigalow, "softwood scrub" species, Moreton Bay ash, spotted gum, narrow-leaved ironbark, poplar box, gum topped box, brigalow and wilga.	IV m4, pd1-3, ps3, r1-3, e3-4

EVERGREEN 2 (continued)

Land Unit	Area%	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU5	<5	Gently inclined undulating rises, 5-10% slopes. Deep gilgai present. Rock outcrop may be present.	Deep, brown and grey, cracking clays with hardsetting to self mulching surfaces; light to medium clay A horizons; medium clay B horizons; usually acid soil reaction trend. Brown and Grey Vertosols.	Brigalow forest. Brigalow.	V m3, pm3, sa2, r1-3, tm5, e3
LU6	<5	Lower slopes and drainage lines, 2-5% slope.	Deep, brown and black, non cracking and cracking clays with hardsetting surfaces; light clay, medium A horizons; light to light medium clay B horizons; neutral to alkaline soil reaction trend. Brown and Black Dermosols and Vertosols.	Eucalypt shrubby woodland. Brigalow, poplar box, gum topped box, wilga and bottle tree.	III m3, ps2, pm2, sa2, e2
LU7	10	Crests and ridges, 3-6% slope. Ferruginous rock may be present on surface.	Shallow to deep, red, gradational soils and non cracking clays with firm to hardsetting surfaces; clay loam to light clay, medium A horizons; light to medium clay B horizons; ferruginous pan may be present in profile; neutral to alkaline soil reaction trend. Red Dermosols.	Brigalow forest or eucalypt woodland. Brigalow or silver-leaved ironbark.	III-IV m3-4, pd2-4, ps3, r1-3, e2-3
LU8	20	Mid and lower slopes, 1-4%.	Deep, grey and brown, cracking clays with self mulching to hardsetting surfaces; light to light medium clay A horizons; medium clay B horizons; alkaline soil reaction trend. Grey and Brown Vertosols.	Brigalow forest. Brigalow, belah and wilga.	III m3, sa2, pm2, e2

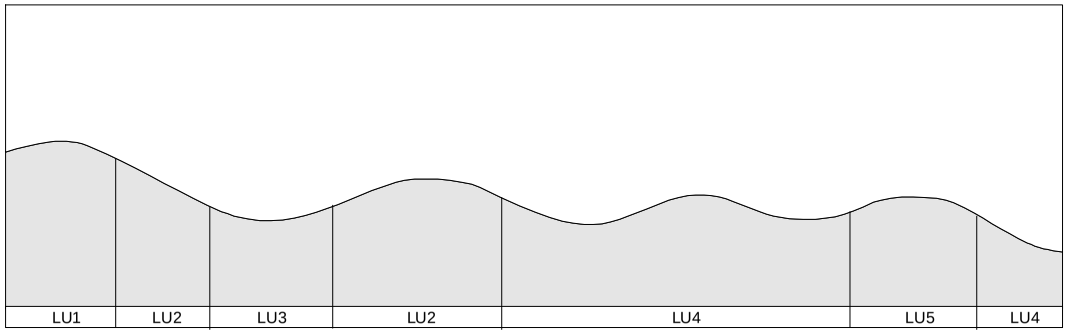
LAND SYSTEM - EVERGREEN 3 (Eg3)

General Description: Undulating low hills on sedimentary rocks. Major soils are deep, black and grey, cracking clays and shallow to deep, grey and brown, sodic duplex soils (Vertosols and Sodosols).

Geology: Evergreen Formation - Labile to sublabile sandstone, siltstone and shale.

Landform: Undulating low hills.

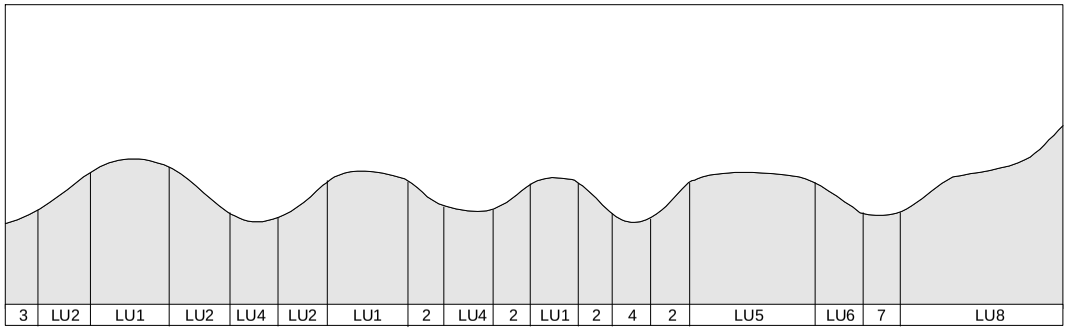
Vegetation: Brigalow forest and eucalypt shrubby woodland, limited to extensive clearing. Brigalow, wilga, belah, bottle trees, false sandalwood, poplar box and narrow-leaved ironbark.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	10	Crests and upper slopes, 3-8%. Medium pebbles on surface and rock outcrop common.	Very shallow to shallow, brown, sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium A horizons; light to light medium clay B horizons; medium gravel usually present throughout; acid to neutral soil reaction trend. Brown Sodosols.	Brigalow open forest. Brigalow and wilga, with some narrow-leaved ironbark.	VI m6, pd4 or 6, ps3, r2-4, e6
LU2	15	Broad crests and midslopes, 8-12%. Common to many ironstone gravel on surface.	Moderately deep to deep, grey and brown, sodic duplex soils with hardsetting surfaces; clay loam, medium A horizons, often with bleached A2 horizons; medium clay B horizons; ironstone gravel present throughout; alkaline soil reaction trend. Grey and Brown Sodosols.	Brigalow open forest. Brigalow, wilga, belah and bottle trees.	VI m6, pd3-4, ps3, sa3, r2, e6
LU3	15	Lower concave slopes, 2-5%.	Moderately deep to deep, grey, sodic duplex soils with hardsetting surfaces; loam to clay loam, medium A horizons, usually with bleached A2 horizons; medium clay B horizons; medium gravel or pebbles often throughout profile; acid or neutral soil reaction trend. Grey Sodosols.	Brigalow open forest. Brigalow, belah, wilga and false sandalwood.	VI m6, pd4, ps3, sa3, e6
LU4	40	Broad crests, mid and lower slopes, 2-5%. Normal gilgai may be present. Few to common surface pebbles. Rock outcrop may be present.	Deep, black and grey, cracking clays with self mulching or hardsetting surfaces; light to light medium clay A horizons; medium to heavy clay B horizons; alkaline or acid soil reaction trend. Black and Grey Vertosols.	Brigalow forest. Brigalow and bottle trees.	III m3, pm2-3, sa3, tm2, r2-3, e2
LU5	20	Broad crests and midslopes, 3-5%.	Moderately deep to deep, grey and brown, sodic duplex soils with hardsetting surfaces; clay loam, medium A horizons, often with bleached A2 horizons; medium clay B horizons; alkaline soil reaction trend. Grey and Brown Sodosols.	Eucalypt shrubby woodland. Poplar box, wilga and brigalow.	VI m6, pd3-4, ps3, sa3, e6

LAND SYSTEM - MONTO (Mt)

General Description: Undulating low hills on sandstone. Major soils are moderately deep to deep, brown, grey and black, cracking clays (Vertosols).
Geology: Mulgildie coal measures - Sandstone, siltstone, shale, mudstone, coal.
Landform: Undulating low hills.
Vegetation: Brigalow forest dominant with occasional eucalypt woodland. Usually completely cleared and either cultivated or under improved pasture. Brigalow, belah, wilga, other scrub species with areas of silver-leaved ironbark, poplar box, Moreton Bay ash and Queensland blue gum.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	20	Crests and upper slopes, 2-8%. Cobble, stone and sometimes boulders may be present on surface, ironstone gravel occasionally present.	Moderately deep, (occasionally shallow) to deep, brown and grey, cracking clays with self mulching surfaces; light to medium clay A horizons; medium to heavy clay B horizons; alkaline soil reaction trend. Brown and Grey Vertosols.	Brigalow closed to open forest. Brigalow, belah, wilga, "softwood scrub" species, occasionally eucalypt woodland. Silver-leaved ironbark, poplar box, Moreton Bay ash and Queensland blue gum.	III m3, sa2, pm2, r1-3, e2-3
LU2	25	Midslopes, 4-10%. Cobble, stone and sometimes boulders may be present or surface.	Moderately deep to deep, black, brown and grey, cracking clays with self mulching surfaces; light to medium clay A horizons; medium to heavy clay B horizons; alkaline soil reaction trend. Black, Brown and Grey Vertosols.	Brigalow closed to open forest. Brigalow, belah, wilga, "softwood scrub" species, occasionally eucalypt woodland. Silver-leaved ironbark, poplar box, Moreton Bay ash and Queensland blue gum.	III m3, sa2, pm2, r1-3, e2-3
LU3	5	Lower slopes, 1-3%.	Moderately deep to deep, brown and grey, cracking clays (occasionally non cracking clays) with self mulching to hardsetting surfaces; light to medium clay A horizons; medium clay B horizons; alkaline soil reaction trend. Brown and Grey Vertosols.	Eucalypt woodland. Poplar box, Moreton Bay ash and Queensland blue gum.	III m3, sa3, pm2-3, e2
LU4	10	Lower slopes and drainage lines, 2-4%.	Deep, black and grey, cracking clays with self mulching surfaces; light to medium clay A horizons; medium to heavy clay B horizons; alkaline soil reaction trend. Black and Grey Vertosols.	Brigalow closed to open forest. Brigalow, belah, wilga and "softwood scrub" species.	III m3, sa2, pm2, e2

MONTO (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU5	20	Broad crests and upper slopes, 1-6%. Common to many, ironstone gravel may be present on surface.	Deep, brown and grey, cracking clays with self mulching surfaces (occasionally hardsetting surfaces); light to medium clay A horizons; medium to heavy clay B horizons; acid soil reaction trend. Brown and Grey Vertosols.	Brigalow closed to open forest. Brigalow, belah, wilga and “softwood scrub” species.	III m3, sa3, pm3, r1-2, e2-3
LU6	10	Midslopes, 4-6%.	Deep, brown and grey, cracking clays with self mulching surfaces; light to medium clay A horizons; medium to heavy clay B horizons; acid soil reaction trend. Brown and Grey Vertosols.	Brigalow closed to open forest. Brigalow, belah, wilga and “softwood scrub” species.	III m3, sa3, pm3, r1-2, e2-3
LU7	5	Lower slopes and drainage lines, 2-4%.	Deep, grey and brown, cracking clays with self mulching surfaces; light to medium clay A horizons; medium to heavy clay B horizons; acid soil reaction trend. Grey and Brown Vertosols.	Brigalow closed to open forest. Brigalow, belah, wilga and “softwood scrub” species.	III m3, sa3, pm3, e2
LU8	5	Upper slopes, 10-15%. Common to many, ferruginised cobble on surface. Ferricrete outcrop may occur. Saline seeps may develop at contact between deeply weathered profile of Mulgildie land system and sedimentary rocks.	Moderately deep to deep, often red, mottled, brown, cracking and non cracking clays with hardsetting surfaces; light clay A horizon; medium clay B horizons; acid or alkaline soil reaction trend. Brown Vertosols and Dermosols.	Brigalow closed to open forest. Brigalow, belah, wilga and “softwood scrub” species.	VI m3-4, sa3-4 or 6, pm3, r2-4, e6

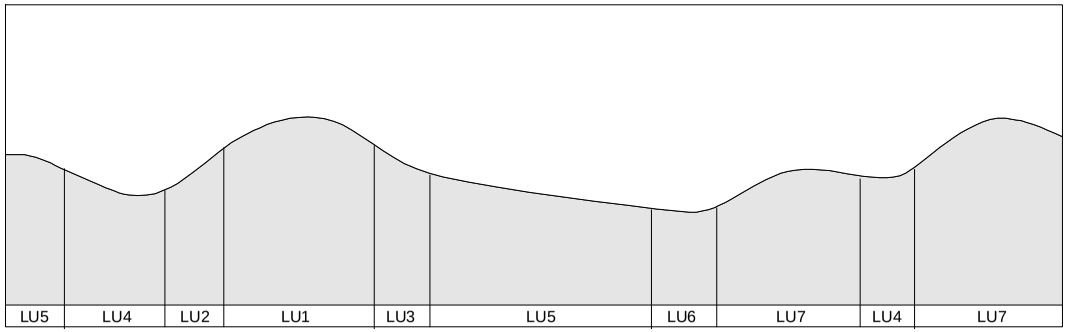
LAND SYSTEM - TRAPYARD (Ty)

General Description: Undulating low hills on sedimentary rocks. Major soils are deep, brown, grey and black, cracking clays with minor shallow, red and brown, non sodic duplex and gradational soils (Vertosols, Chromosols, Kandosols and Dermosols).

Geology: Undifferentiated Tertiary Sediments - Shale, sandstone, brown coal, conglomerate.

Landform: Undulating low hills, minor residual ridges.

Vegetation: Brigalow forest usually completely cleared but with limited clearing on residual ridges. Brigalow, "softwood scrub" species, narrow-leaved ironbark, gum topped box, red ash and wattles.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	10	Residual crests, 2-5%. Ironstone gravel on surface.	Shallow, red, non sodic duplex and gradational soils with hardsetting surfaces; loam to clay loam, thick A horizons; light clay, weakly to moderately structured B horizons; usually common to abundant ironstone gravel in B horizon and lower A horizon; acid soil reaction trend. Red Chromosols and Kandosols.	Eucalypt shrubby woodland. Narrow-leaved ironbark, wattles and red ash.	VI m6, pd3-4, ps3, nd3, r3, e3
LU2	5	Midslopes, 5-10%. Rock outcrop common to abundant.	Shallow, red and brown, gradational soils with hardsetting surfaces; clay loam, medium A horizons; light clay B horizons; often medium gravel throughout profile; acid soil reaction trend. Red and Brown Dermosols.	Eucalypt shrubby woodland. Narrow-leaved ironbark, gum topped box, brigalow and wattles.	VI-VII m6, pd3-4, ps3, nd3, r4-5, e6
LU3	5	Upper midslopes, 5-10%. Surface cobble and ironstone gravel common.	Shallow to moderately deep, brown, cracking clays with hardsetting surfaces; light clay A horizons; medium clay B horizons; ironstone gravel common throughout profile; alkaline soil reaction trend. Brown Vertosols.	Brigalow forest. Brigalow.	VI m3-4, pd1-3, r3-4, e4
LU4	10	Lower concave slopes, 3-5%. Ironstone gravel common on surface. Normal gilgai may be present.	Deep, brown, cracking clays with self mulching surfaces; light clay, A horizons; medium clay B horizons; usually medium ironstone gravel throughout profile; alkaline soil reaction trend. Brown Vertosols.	Brigalow forest. Brigalow and "softwood scrub" species.	III m3, pm3, r2, tm2, sa3, e2

TRAPYARD (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU5	30	Mid to lower slopes; 4-6%. Normal gilgai may be present.	Deep, brown, cracking clays with self mulching surfaces; light medium clay A horizons; medium clay B horizons; usually small ironstone gravel throughout profile; acid and alkaline soil reaction trend. Brown Vertosols.	Brigalow forest. Brigalow.	III m3, pm3, r2, tm2, sa3, e2-3
LU6	20	Lower slopes, 2-4%.	Deep, black and grey, cracking clays with self mulching surfaces; light medium clay A horizons; medium to heavy clay B horizons; ironstone gravel may be present in upper part of profile; usually acid soil reaction trend. Black and Grey Vertosols.	Brigalow forest. Brigalow and belah.	III m3, pm3, sa3, e2
LU7	20	Broad ridges, crests and upper slopes, 3-8%.	Deep, brown, cracking clays (minor non-cracking clays) with self mulching surfaces; light clay A horizons; medium clay B horizons; usually alkaline soil reaction trend. Brown Vertosols.	Shrubland. “Softwood scrub” species.	III m3, pm2, sa3, e2-3

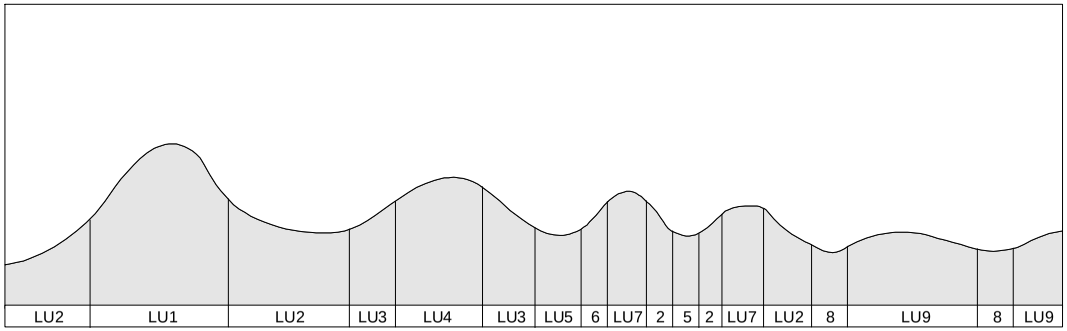
LAND SYSTEM - KAPALDO (Kp)

General Description: Undulating low hills to rolling low hills on sedimentary rocks. Major soils are moderately deep to deep, brown and grey, cracking and non cracking clays and shallow to moderately deep, red and brown, non sodic duplex soils and gradational soils (Dermosols and Chromosols).

Geology: Hutton Sandstone/Mulgildie Coalmeasures - Sandstone, siltstone, shale, mudstone and coal.

Landform: Undulating low hills to rolling low hills.

Vegetation: Brigalow forest with minor eucalypt shrubby forest, usually completely cleared. Brigalow, "softwood scrub" species, narrow-leaved ironbark and poplar box.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	<5	Crests and upper slopes, 10-35%. Rock outcrop and surface cobble and stone common to abundant.	Very shallow to shallow, stony, medium textured soils over rock with hardsetting surfaces; clay loam, thin to medium A horizons; acid soil reaction trend. Leptic Tenosols.	Eucalypt shrubby woodland. Narrow-leaved ironbark and "softwood scrub" species.	VII m6, pd6, ps3, r3-5, ts6-7, e6-7
LU2	30	Mid and lower slopes, 5-12%.	Moderately deep to deep, grey, non cracking (occasionally cracking) clays with hardsetting surfaces; light clay, medium A horizons; light to medium clay B horizons; alkaline soil reaction trend. Grey Dermosols.	"Softwood scrub" forest. "Softwood scrub" species and brigalow.	III-IV m3, ps3, e3-4
LU3	<5	Midslopes, 10-15%, some as steep as 20%. Pebbles and cobble may be present on surface.	Shallow to moderately deep, red and brown, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons; clay loam to light medium clay B horizons, usually few to many pebbles; acid soil reaction trend. Red and Brown Dermosols.	Eucalypt shrubby forest. Narrow-leaved ironbark, red ash, wilga and wattles.	VI m3-4, ps3, r2-4, ts6, e6
LU4	5	Crests and upper slopes, 15-30%. Rock outcrop and ferruginised cobble common.	Shallow to moderately deep, often mottled, red and brown, non sodic duplex soils with hardsetting surfaces; fine sandy loam to loam, medium A horizons; light to medium clay B horizons; few to common, medium to large gravel or ironstone may be present throughout profile; acid soil reaction trend. Red Chromosols.	Eucalypt shrubby forest. Narrow-leaved ironbark, red ash, wilga and wattles.	VI-VII m3-4, ps3, r3-5, ts6-7, e6-7

KAPALDO (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU5	5	Lower slopes and drainage lines, 2-5%.	Deep, brown, gradational and sodic duplex soils with hardsetting surfaces; clay loam, medium A horizons, occasionally with bleached A2 horizons; light to medium clay B horizons; alkaline soil reaction trend. Brown Dermosols and Sodosols.	Brigalow forest. Brigalow, poplar box and wilga.	IV or VI m3-4 or 6, ps3, e3
LU6	5	Midslopes, 8-15%. Ironstone gravel usually common on surface.	Deep, brown, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium to thick A horizons; medium clay B horizons; ironstone gravel may be present throughout profile; neutral to alkaline soil reaction trend. Brown Dermosols.	Brigalow forest. Brigalow, limebush and poplar box.	III-IV m3-4, ps3, r2-3, e3-4
LU7	20	Broad ridges, crests and upper slopes, 2-10%. Normal gilgai may be present. Ironstone gravel usually common on surface.	Deep, brown, cracking and non cracking clays with firm to hardsetting surfaces; light clay A horizons; medium clay B horizons; acid to alkaline soil reaction trend. Brown Vertosols and Dermosols.	Brigalow forest. Brigalow.	III m3, ps3, pm2, r2-3, tm2, e2-3
LU8	5	Lower slopes and drainage lines, 2-5% slope. Ironstone gravel may be present on surface. Normal gilgai may be present.	Deep, grey and brown, cracking clays usually with hardsetting surfaces; light to light medium clay A horizons; medium clay B horizons; usually alkaline soil reaction trend (occasionally acid). Grey and Brown Vertosols.	Brigalow forest. Brigalow, wilga and “softwood scrub” species.	III m3, pm2-3, r2-3, tm2, e2
LU9	25	Broad ridges, crests and mid and upper slopes, 3-8%. Normal gilgai may be present. Ironstone gravel may be present on surface.	Deep, brown and grey, cracking clays with hardsetting surfaces; light clay A horizons; medium clay B horizons; acid and alkaline soil reaction trend. Brown and Grey Vertosols.	Brigalow forest. Brigalow, limebush, false sandalwood and “softwood scrub” species.	III m3, pm2, r2-3, tm2, e2-3

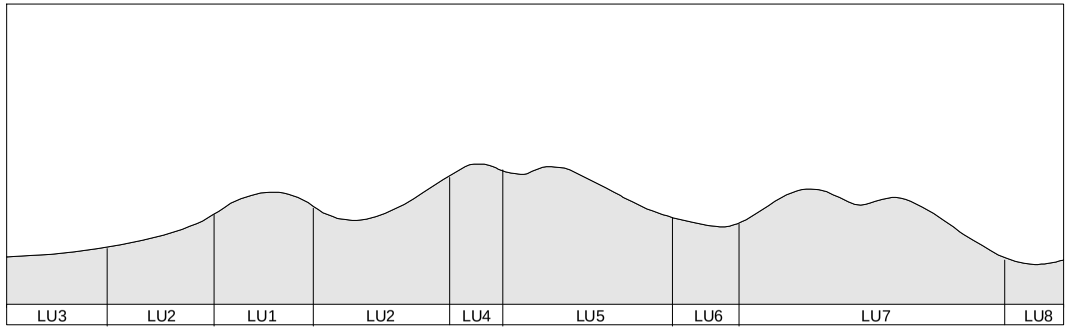
LAND SYSTEM - SCALPER (Sp)

General Description: Undulating low hills and minor rolling low hills, primarily on sedimentary rocks. Major soils are very shallow to shallow, grey, red and brown, gradational soils and non cracking clays and moderately deep to deep, brown and grey, non cracking and cracking clays and sodic duplex soils (Dermosols, Vertosols and Sodosols).

Geology: On margins of contact between Youlambie Conglomerate, Rannes Beds and Camboon Andesite - primarily slate, shale, mudstone, siltstone.

Landform: Undulating low hills with minor rolling low hills.

Vegetation: Brigalow/"softwood scrub" forest, patches of brigalow open forest and eucalypt woodland and shrubby woodland, extensively cleared. "Softwood scrub" species, brigalow, wilga, false sandalwood, narrow-leaved ironbark, silver-leaved ironbark, gum topped box and poplar box.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	10	Crests and upper slopes, 5-10%.	Very shallow to shallow, often mottled, grey, non cracking clays with firm to hardsetting surfaces; light clay, medium to thick A horizons, often with bleached A2 horizons; (if present) light to medium clay B horizons over shale; alkaline soil reaction trend. Grey Dermosols and Leptic Tenosols.	"Softwood scrub" forest. "Softwood scrub" species.	VI m6, pd4 or 6, ps3, e4 or 6
LU2	20	Mid and lower slopes, 4-8%.	Moderately deep to deep, brown and grey, non cracking clays with firm to hardsetting surfaces; light clay, medium to thick A horizons, often with bleached A2 horizons; light to medium clay B horizons over shale; alkaline soil reaction trend. Brown and Grey Dermosols.	Brigalow forest. Brigalow and "softwood scrub" species.	III-IV m3-4, ps3, e3
LU3	15	Lower slopes, 3-5%.	Moderately deep to deep, brown, cracking clays with self mulching to hardsetting surfaces; light clay A horizons; medium clay B horizons over mudstone or siltstone; alkaline soil reaction trend. Brown Vertosols.	Brigalow forest. Brigalow and "softwood scrub" species.	III m3, pm3, sa3, e2
LU4	5	Hill crests and upper slopes, 5-10%. Pebbles and cobble usually present on surface.	Shallow, red and brown, sodic duplex soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons, often with bleached A2 horizons; medium pebbles; medium clay B horizons; neural to alkaline soil reaction trend. Red and Brown Sodosols and Dermosols.	Brigalow open forest. Brigalow, bottle trees, false sandalwood and corkwood wattle.	VI m4, pd3-4, ps3, r2-3, e4

SCALPER (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU5	20	Crests and slopes, 5-12%. Surface pebbles and cobble common. Rock outcrop may be present.	Very shallow to shallow, red and brown, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay A horizons; light clay B horizons over shale; alkaline soil reaction trend. Red and Brown Dermosols.	Eucalypt shrubby woodland. Narrow-leaved ironbark, silver-leaved ironbark, gum topped box, wilga, corkwood and "softwood scrub" species.	VI m6, pd4 or 6, ps3, r3-4, e4 or 6
LU6	5	Lower concave slopes and drainage lines, 3-6%.	Moderately deep to deep, brown, sodic duplex soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons, usually with bleached A2 horizons; medium clay B horizons usually over shale, medium pebbles common throughout profile; alkaline soil reaction trend. Brown Sodosols and Dermosols.	Eucalypt woodland. Poplar box, silver-leaved ironbark, false sandalwood and corkwood wattle.	VI m4 or 6, pd3-4, ps3, e6
LU7	20	Crests and slopes, 3-6%.	Shallow to moderately deep, red, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay medium A horizons; light clay to light medium clay B horizons over igneous or sedimentary rocks; medium pebbles may be present throughout profile; neutral to alkaline soil reaction trend. Red Dermosols.	Eucalypt woodland. Silver-leaved ironbark, bloodwoods, Moreton Bay ash, poplar box and bottle trees.	IV m3-4, pd2-4, ps3, e2-3
LU8	5	Lower concave slopes and drainage lines, 2-5%.	Moderately deep to deep, grey to brown, sodic duplex soils with hardsetting surfaces; clay loam, medium A horizons, with bleached A2 horizons; medium clay B horizons; alkaline soil reaction trend. Grey and Brown Sodosols.	Eucalypt woodland. Poplar box, silver-leaved ironbark, Moreton Bay ash and Queensland blue gum.	VI m4, pd4, ps3, sa3, e4 or 6

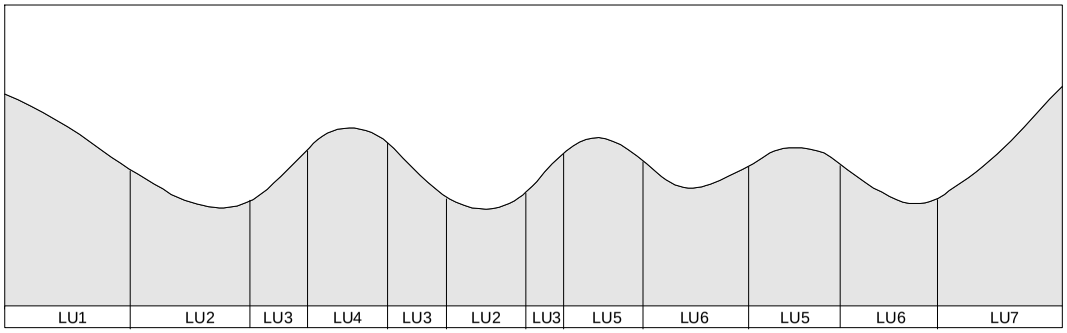
LAND SYSTEM - EVERGREEN 4 (Eg4)

General Description: Undulating low hills to rolling low hills on sedimentary rocks, usually in relatively small isolated areas between other larger land systems. Major soils are shallow to deep, red, brown and grey, gradational soils and non cracking clays and deep, brown and grey, cracking clays (Dermosols and Vertosols).

Geology: Evergreen Formation - Siltstone, sublabile sandstone.

Landform: Undulating low hills to rolling low hills.

Vegetation: Brigalow/"softwood scrub" forest, usually extensively to completely cleared. Brigalow and "softwood scrub" species.



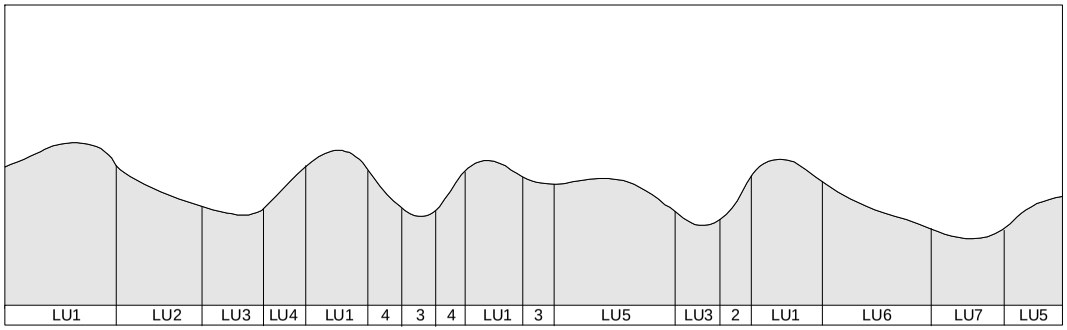
Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	5	Upper to mid slopes, 15-30% on edges of land system. Common ironstone gravel may occur on surface.	Shallow to moderately deep, red and brown, gradational and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons; light to medium clay B horizons; common to many small pebbles may be present in profile; acid to neutral soil reaction trend. Red and Brown Dermosols.	Brigalow forest. Brigalow and "softwood scrub" species.	VI-VII m3-4, pd1-3, ps3, ts6-7, r2-3, e6
LU2	10	Lower slopes and drainage lines, 4-8% slope.	Moderately deep to deep, often mottled, brown and grey, non cracking clays with firm to hardsetting surfaces; light clay, medium A horizons; medium clay B horizons; neutral to alkaline soil reaction trend. Brown and Grey Dermosols.	Brigalow forest. Brigalow and "softwood scrub" species.	III-IV m3-4, pd1-2, ps3, e2-3
LU3	20	Mid slopes, 5-10%. Common ironstone gravel may occur on surface.	Moderately deep to deep, sometimes mottled, brown and grey, non cracking clays with hardsetting surfaces; light clay, medium A horizons; medium clay B horizons; small gravel or pebbles may be present especially at depth; alkaline (occasionally acid) soil reaction trend. Brown and Grey Dermosols.	Brigalow forest. Brigalow, bottle trees and "softwood scrub" species.	III-IV m3-4, pd1-2, ps3, r2, e2-3
LU4	10	Crests and upper slopes, 3-10%. Common ironstone gravel may occur on surface.	Shallow to moderately deep, red and brown, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons; light to medium clay B horizons, often with small pebbles; acid to neutral soil reaction trend. Red and Brown Dermosols.	"Softwood scrub" forest. "Softwood scrub" species.	III-IV m3-4, pd1-3, ps3, r2-3, e3-4

EVERGREEN 4 (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU5	20	Crests and upper slopes, 3-10%. Some slopes as steep as 15%.	Moderately deep to deep, brown, cracking and non cracking clays with hardsetting to self mulching surfaces; light clay medium A horizons; light to medium clay B horizons; small pebbles may be present; acid to neutral soil reaction trend. Brown Vertosols and Dermosols.	"Softwood scrub" forest. "Softwood scrub" species and brigalow.	III-IV m3-4, ps3, pm2, e2-4
LU6	30	Mid and lower slopes, 3-10%. Some midslopes as steep as 15%.	Deep, brown and grey, cracking clays with self mulching surfaces; light to light medium clay A horizons; medium clay B horizons; few to common small pebbles may be present; neutral to alkaline soil reaction trend, occasionally acid trend. Brown and Grey Vertosols.	Brigalow forest. Brigalow and "softwood scrub" species.	III-IV m3, pm2, e2-4
LU7	5	Mid and upper slopes, 15-30% on edge of land system.	Deep, brown and grey, cracking clays with self mulching surfaces; light to light medium clay A horizons; medium clay B horizons; few to common small pebbles may be present; neutral to alkaline soil reaction trend, occasionally acid trend. Brown and Grey Vertosols.	Brigalow forest. Brigalow and "softwood scrub" species.	VI-VII m3, pm2, ts6-7, e6

LAND SYSTEM - CASWELL 1 (Cw1)

General Description: Undulating hills to rolling hills (some steep hills) on sedimentary rocks. Major soils are shallow to deep, red and brown, gradational soils and non cracking clays and very shallow, stony medium and fine textured soils over rock (Dermosols and Tenosols).
Geology: Crana Beds - Mudstone, siltstone, lithic arenite, rare andesite.
Landform: Undulating hills to rolling hills with some steep hills.
Vegetation: "Softwood scrub" forest, usually completely cleared. "Softwood scrub" species and brigalow.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	20	Crests and upper slopes, 10-20%, some upper slopes as steep as 50%. Rock outcrop and surface stone may be present.	Very shallow, stony, uniform, medium and fine textured soils over rock and very shallow to shallow, red to brown, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons; light clay B horizons, usually many to abundant, fine to medium gravel throughout profile; neutral to alkaline soil reaction trend. Leptic Tenosols and Brown and Red Dermosols.	"Softwood scrub" forest. "Softwood scrub" species.	VI-VII m6, pd4 or 6, ps3, ts6(7), r1-3, e6
LU2	30	Mid concave slopes, 12-20%.	Moderately deep to deep, brown and red, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons; medium clay B horizons, usually with few to many angular fine to medium gravel becoming abundant at depth; alkaline soil reaction trend. Brown and Red Dermosols.	"Softwood scrub" forest. "Softwood scrub" species.	VI m3, ps3, ts6, e6
LU3	5	Lower slopes and drainage lines, 4-10%.	Moderately deep to deep, occasionally mottled, brown and red, non cracking clays with firm to hardsetting surfaces; light clay, medium A horizons; light to light medium clay B horizons, with very few to few, medium gravel, increasing to abundant at depth; neutral to alkaline soil reaction trend. Brown and Red Dermosols.	"Softwood scrub" forest. "Softwood scrub" species.	III-IV m3, ps3, e3-4

CASWELL 1 (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU4	15	Mid convex slopes, 12-20%, some slopes as high as 30%.	Shallow to moderately deep, brown and red, non cracking clays with firm to hardsetting surfaces; light clay, medium A horizons; medium clay B horizons, usually few to common, fine to medium gravel throughout profile; neutral soil reaction trend. Brown and Red Dermosols.	Brigalow forest. Brigalow and "softwood scrub" species.	VI m3-4, pd2-3, ps3, ts6-7, e6
LU5	15	Lower broader crests, 5-10%.	Shallow to moderately deep, brown and red, gradational soils and non cracking clays with firm to hardsetting surfaces; clay loam to light clay, medium A horizons; light clay B horizons; many to abundant medium gravel at depth; neutral to alkaline soil reaction trned. Brown and Red Dermosols.	"Softwood scrub" forest. "Softwood scrub" species.	III-IV m3-4, pd2-3, ps3, e3
LU6	10	Lower mid slopes, 5-10%.	Moderately deep to deep, brown, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons, occasionally with bleached A2 horizons; light to medium clay B horizons; usually few, fine to medium gravel in upper profile increasing to common to many at depth; neutral to alkaline soil reaction trend. Brown Dermosols.	"Softwood scrub" forest. "Softwood scrub" species.	III-IV m3-4, ps3, e3
LU7	5	Lower slopes, 3-6%.	Deep, brown, non cracking clays with hardsetting surfaces; light clay, medium A horizons, occasionally with bleached A2 horizons; medium clay B horizons; few to common, fine to medium gravel throughout profile; alkaline soil reaction trend. Brown Dermosols.	Brigalow forest. Brigalow and "softwood scrub" species.	VI m3-4, ps3, sa3, e6

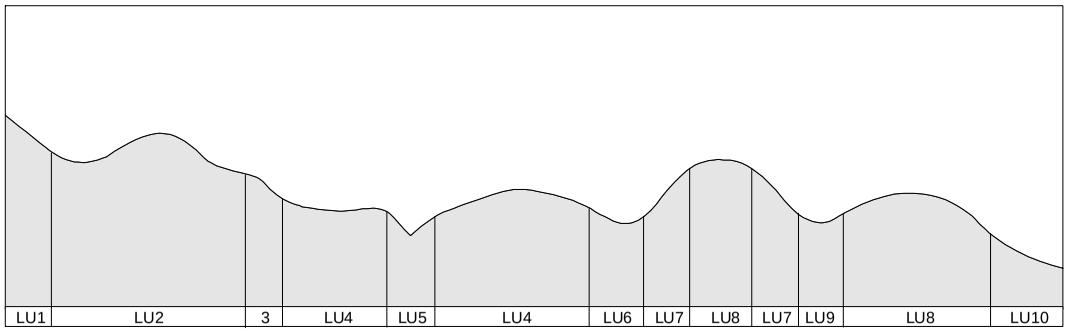
LAND SYSTEM - EVERGREEN 5 (Eg5)

General Description: Rolling hills to steep hills on sedimentary rocks. Major soils are deep, grey and brown, cracking clays and moderately deep to deep, red and brown, gradational soils and non cracking clays (Vertosols and Dermosols).

Geology: Evergreen Formation - Labile to sublabile sandstone.

Landform: Rolling hills with steeper slopes and relief towards Coominglah Range. Some steep slopes above benches.

Vegetation: "Softwood scrub" forest and minor shrubby woodland, usually completely cleared. "Softwood scrub" species with minor poplar box, gum topped box and Moreton Bay ash.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	<5	Steep slopes, 30-40% on edge of Comminglah land system. Rock outcrop and laterite and sandstone cobble common on surface.	Moderately deep to deep, grey and brown, cracking clays with self mulching surfaces; light clay A horizons; medium clay B horizons; acid soil reaction trend. Grey and Brown Vertosols.	Forest. "Softwood scrub" species.	VII m3, pm2, ts7, r4-5, e7
LU2	10	Crests and slopes higher in the landscape, 10-20%. Rock outcrop and surface stone may be present on surface.	Deep, brown and grey, cracking clays with self mulching to hardsetting surfaces; light to medium clay A horizons; medium to heavy clay B horizons; acid soil reaction trend. Brown and Grey Vertosols.	Forest. "Softwood scrub" species.	VI m3, pm2, ts6, r2-4, e6
LU3	<5	Steep drop off to benches, 30-40%. Rock outcrop and surface stone common.	Deep, brown and grey, cracking clays with self mulching to hardsetting surfaces; light to medium clay A horizons; medium to heavy clay B horizons; acid soil reaction trend. Brown and Grey Vertosols.	Forest. "Softwood scrub" species.	VII m3, pm2, ts7, r4-5, e7
LU4	15	Benches, crests and slopes, 10-15%. Cobble may be common on surface.	Moderately deep to deep, brown and red, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons; light to light medium clay B horizons; acid to alkaline soil reaction trend. Brown and Red Dermosols.	Forest or eucalypt shrubby woodland. Belah, bottle trees, "softwood scrub" species, poplar box, Moreton Bay ash and gum topped box.	VI m3-4, ps3, r2-3, e6

EVERGREEN 5 (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU5	<5	Deep, steep sided drainage depressions, 30-50% side slopes.	Moderately deep to deep, brown and red, gradational and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons; light to light medium clay B horizons; acid to alkaline soil reaction trend. Brown and Red Dermosols.	Forest or eucalypt shrubby woodland. Belah, bottle trees, "softwood scrub" species, poplar box, Moreton Bay ash and gum topped box.	VII m3-4, ps3, ts7, e7
LU6	<5	Lower concave slopes, 5-10%.	Deep, grey, cracking clays with self mulching to hardsetting surfaces; light clay A horizons; medium clay B horizons; alkaline soil reaction trend. Grey Vertosols.	Eucalypt shrubby woodland. Poplar box, gum topped box, belah and "softwood scrub" species.	III m3, pm2, e3
LU7	30	Mid slopes, 10-20%. Normal gilgai may be present.	Deep, grey and brown, cracking clays with self mulching surfaces; light to medium clay A horizons; medium to heavy clay B horizons; alkaline soil reaction trend. Grey and Brown Vertosols.	Forest. "Softwood scrub" species.	VI m3, pm3, tm2, e6
LU8	20	Crests, lower ridges and upper slopes, 5-10%. Normal gilgai may be present.	Deep, grey and brown, cracking clays with self mulching surfaces; light to medium clay A horizons; medium to heavy clay B horizons; alkaline soil reaction trend. Grey and Brown Vertosols.	Forest. "Softwood scrub" species.	III m3, pm3, tm2, e3
LU9	10	Lower concave slopes, 5-10%. Normal gilgai may be present.	Deep, sometimes mottled, grey cracking clays with self mulching surfaces; light to medium clay A horizons; medium to heavy clay B horizons; alkaline soil reaction trend. Grey Vertosols.	Forest. "Softwood scrub" species.	III m3, pm3, tm2, e3
LU10	<5	Lower pediments, sloping to alluvium, 2-5%.	Deep, grey and black, cracking clays with hardsetting to self mulching surfaces; light clay A horizons; light to medium clay B horizons; alkaline soil reaction trend. Grey and Black Vertosols.	Eucalypt woodland. Poplar box.	III m3, pm3, e3

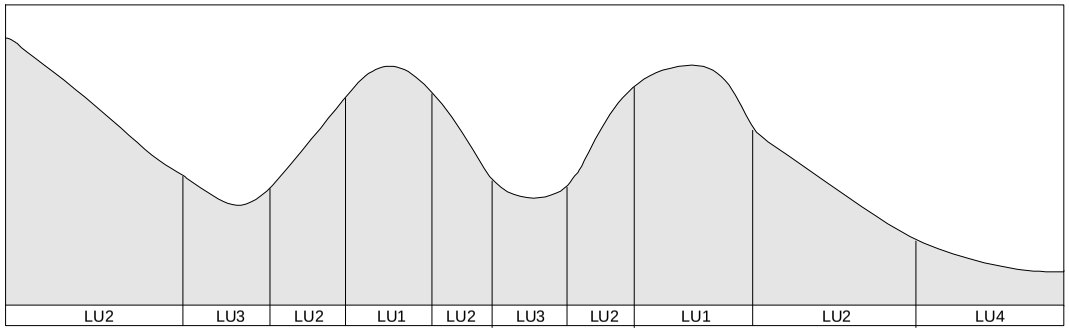
LAND SYSTEM - BANIA 1 (Ba1)

General Description: Rolling hills to steep hills on sedimentary rocks. Major soils are shallow to moderately deep, red and brown, weakly to moderately structured, gradational soils and non cracking clays (Kandosols and Dermosols).

Geology: Wandilla Formation - mudstone, arenite, siltstone, jasper, chert, slate, schist.

Landform: Rolling hills to steep hills.

Vegetation: "Softwood scrub" forest with no effective disturbance in forestry reserves but usually extensively to completely cleared on other lands. "Softwood scrub" species with minor silver-leaved ironbark woodland.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	30	Crests and upper slopes, 5-30%. Common medium gravel on surface. Rock outcrop common in places.	Shallow to moderately deep, red, gradational soils and non cracking clays with loose surfaces; clay loam to light clay, medium A horizons; light clay, weakly structured B horizons; few to abundant, medium gravel throughout profile; acid soil reaction trend. Red Kandosols.	Forest. "Softwood scrub" species.	VI-VII m3-4, pd2-3, ps3, ts6-7, r3-5, e6
LU2	40	Mid slopes, 15-30%, some as high as 60%. Medium gravel and rock outcrop may occur.	Shallow to moderately deep, red, gradational soils and non cracking clays with firm to hardsetting surfaces; clay loam to light clay A horizons; light clay, weakly to moderately structured B horizons; usually few to common medium gravel throughout profile; acid soil reaction trend. Red Kandosols and Dermosols.	Forest. "Softwood scrub" species.	VI-VIII m3-4, pd2-3, ps3, ts6-8, r2-4, e6-7
LU3	25	Lower concave slopes, 15-25%. Medium gravel may occur on surface.	Shallow to moderately deep, red and brown, gradational soils and non cracking clays with firm to hardsetting surfaces; clay loam to light clay, medium A horizons; light clay, weakly to moderately structured B horizons; few to common, medium gravel either throughout profile or in B horizon; acid soil reaction trend. Red and Brown Dermosols and Kandosols.	Forest "Softwood scrub" species.	VI m3-4, pd2-3, ps3, ts6, r2-3, e6
LU4	5	Lower slopes and drainage lines, 5-15%.	Moderately deep to deep, red and brown, gradational and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons; light clay B horizons; acid to neutral soil reaction trend. Red and Brown Dermosols.	Eucalypt woodland. Silver-leaved ironbark.	IV m3, ps3, e4

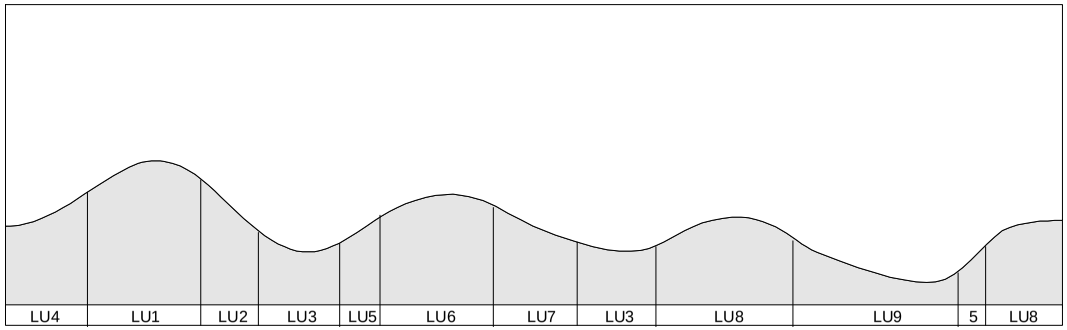
LAND SYSTEM - CYNTHIA (Cy)

General Description: Undulating rises on sedimentary rocks. Major soils are moderately deep to deep, black and grey, cracking clays and brown and grey, sodic duplex soils and shallow to moderately deep, brown, black and grey, non cracking clays (Vertosols, Sodosols, Chromosols and Dermosols).

Geology: Cynthia Beds - Boulder conglomerate, arenite, siltstone, rhyolitic flows and tuff.

Landform: Undulating rises**.**

Vegetation: Eucalypt shrubby woodland, extensively to completely cleared. Narrow-leaved ironbark, gum topped box, silver-leaved ironbark, Moreton Bay ash, poplar box, brigalow, wilga and wattles.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	5	Crests and upper slopes, 5-10%. Often common to abundant ironstone gravel on surface and rock outcrop.	Shallow to moderately deep, red and brown, sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium A horizons, usually with ironstone gravel; light to medium clay B horizons; acid to neutral soil reaction trend. Red and Brown Chromosols.	Eucalypt shrubby woodland. Narrow-leaved ironbark, gum topped box, corkwood and other wattles.	VI-VII m4, pd3-4, ps3, r3-5, e6
LU2	10	Midslopes, 5-10%. Surface cobble and rock outcrop often present.	Moderately deep to deep, sometimes mottled, brown and yellow, sodic duplex soils with hardsetting surfaces; sandy clay loam, medium to thick A horizons, usually with bleached A2 horizons, often with common to abundant gravel; light to medium clay B horizons; acid to neutral soil reaction trend. Brown and Yellow Sodosols and Chromosols.	Eucalypt shrubby woodland. Narrow-leaved ironbark, gum topped box, spotted gum, wattles and *Casuarina* species.	VI m4 or 6, pd3-4, ps3, r3-4, e6
LU3	5	Lower slopes, 2-4%.	Moderately deep to deep, brown and black, sodic duplex soils with hardsetting surfaces; clay loam, medium A horizons, with common to abundant gravel, often with bleached A2 horizons; medium clay B horizons; alkaline soil reaction trend. Brown and Black Sodosols.	Eucalypt shrubby woodland. Gum topped box, poplar box, occasionally Queensland blue gum, beefwood, wilga and false sandalwood.	VI m6, pd3-4, ps3, e6
LU4	15	Midslopes, 4-6%.	Moderately deep to deep, mottled, grey, sodic duplex soils with hardsetting surfaces; sandy clay loam, medium to thick A horizons, with bleached A2 horizons; medium clay B horizons; acid soil reaction trend. Grey Sodosols.	Eucalypt shrubby woodland. Spotted gum, narrow-leaved ironbark, bloodwoods and wattles.	VI m6, pd3-4, ps3, e6

CYNTHIA (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU5	15	Mid and lower slopes, 4-6%. Gilgai may be present. Medium to coarse gravel common on surface.	Deep, grey, cracking clays with hardsetting to self mulching surfaces; light clay A horizons; medium clay B horizons; alkaline soil reaction trend. Grey Vertosols.	Brigalow forest. Brigalow and "softwood scrub" species.	III-VI m3, pm3, tm2, sa3, r2-3, e2-3
LU6	10	Crests and upper slopes 2-4%. Rock outcrop and surface gravel common.	Shallow, black and grey, non cracking (occasionally cracking) clays with hardsetting to self mulching surfaces; light clay, medium A horizons; light to medium clay B horizons; neutral to alkaline soil reaction trend. Black and Grey Dermosols.	Eucalypt woodland. Gum topped box, Moreton Bay ash and poplar box.	IV m4, pd3-4, ps2, r2-4, e2
LU7	20	Midslopes, 5-8%.	Moderately deep to deep, black and grey, cracking clays with self mulching surfaces; light to medium clay A horizons; medium clay B horizons; alkaline soil reaction trend. Black and Grey Vertosols.	Eucalypt shrubby woodland. Gum topped box, Moreton Bay ash and wilga with patches of Brigalow scrub.	III m3, pm3, sa3, e2-3
LU8	10	Crests and upper slopes, 3-5%. Surface stone common.	Moderately deep to deep, red and brown, non cracking clays with hardsetting surfaces; light clay, medium A horizons; light to medium clay B horizons; usually with common gravel throughout profile; alkaline soil reaction trend. Red and Brown Dermosols.	Eucalypt shrubby woodland. Silver-leaved ironbark, gum topped box, Moreton Bay ash and wilga.	III-IV m3-4, ps3, r2-3, e2
LU9	10	Mid and lower slopes, 4-6%.	Deep, black and grey, cracking clays with hardsetting to self mulching surfaces; light to medium clay A horizons; medium to heavy clay B horizons; alkaline soil reaction trend. Black and Grey Vertosols.	Eucalypt shrubby woodland. Poplar box and wilga.	III m3, pm2, sa3, e2-3

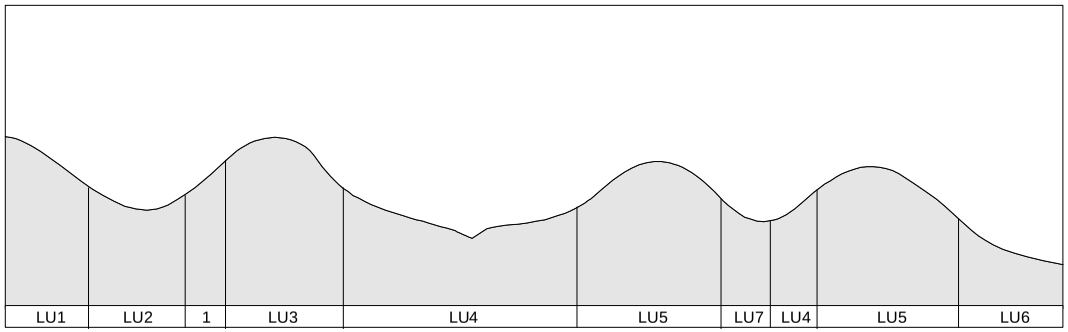
LAND SYSTEM - HUTTON 1 (Ht1)

General Description: Undulating low hills on sedimentary rocks. Major soils are shallow to deep, brown, sodic duplex soils and moderately deep to deep, brown and grey, non cracking clays (Sodosols and Dermosols).

Geology: Hutton Sandstone - Quartz sandstone, siltstone and shale.

Landform: Undulating low hills.

Vegetation: Eucalypt shrubby woodland, extensively to completely cleared. Silver-leaved ironbark, poplar box, narrow-leaved ironbark, Moreton Bay ash, brigalow, belah, wilga and bottle trees.



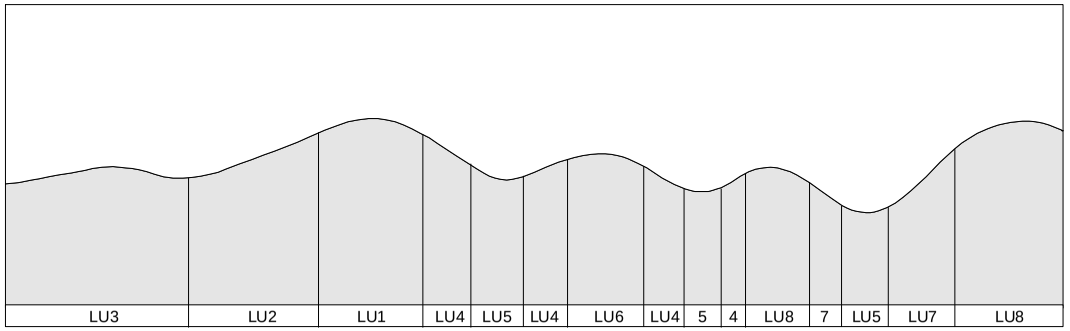
Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	30	Mid slopes, 5-10%. Quartz fragments often on surface.	Deep, brown, sodic duplex soils with hardsetting surfaces; clay loam, medium to thick A horizons, usually with bleached A2 horizons; medium clay B horizons; few to abundant, quartz and ironstone fragments often throughout profile; alkaline soil reaction trend. Brown Sodosols and Chromosols.	Shrubby woodland. Brigalow, silver-leaved ironbark, poplar box, wilga and false sandalwood	IV and VI m4 or 6, pd2-3, ps3, sa2-3, e4 or 6
LU2	20	Lower concave slopes and drainage lines, 1-3%.	Deep, brown, sodic duplex soils with hardsetting surfaces; clay loam, medium to thick A horizons, with bleached A2 horizons; medium clay B horizons; alkaline soil reaction trend. Brown Chromosols and Sodosols.	Eucalypt shrubby woodland. Silver-leaved ironbark, poplar box, Queensland blue gum, Moreton Bay ash, brigalow, wilga and bottle trees.	IV and VI m4 or 6, pd2-3, ps3, sa2-3, e4 or 6
LU3	20	Crests and upper slopes, 5-12%.	Shallow to moderately deep, brown, sodic duplex soils with hardsetting surfaces; clay loam, medium to thick A horizons, usually with bleached A2 horizons; medium clay B horizons; quartz grains common throughout profile; alkaline soil reaction trend. Brown Chromosols and Sodosols.	Eucalypt shrubby woodland. Silver-leaved ironbark, brigalow and wilga.	IV and VI m4 or 6, pd2-3, ps3, sa2-3, e4 or 6
LU4	10	Mid and lower slopes, 2-8%. Quartz pebbles on surface.	Shallow to moderately deep, brown, sodic duplex soils with hardsetting surfaces; clay loam, medium A horizons, with bleached A2 horizons; medium clay B horizons; usually quartz grains throughout; occasionally hard pan or stony layer; alkaline soil reaction trend. Brown Sodosols.	Open forest. Brigalow and wilga.	VI m6, pd3-4, ps3, nd3, sa2, e3-4.

HUTTON 1 (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU5	10	Crests and upper slopes, 5-10%.	Moderately deep to deep, grey and brown, non cracking clays with hardsetting surfaces; light clay, medium A horizons; medium clay B horizons; alkaline soil reaction trend. Grey and Brown Dermosols.	Open forest. Brigalow and wilga.	III m3, ps3, e3
LU6	5	Mid and lower slopes, 4-8%. Ironstone may be present on surface.	Deep, brown, non cracking clays with hardsetting surfaces; light clay, medium A horizons; medium clay B horizons; acid and alkaline soil reaction trend. Brown Dermosols.	Forest. Belah, brigalow and wilga.	III m3, ps3, e3
LU7	5	Lower slopes and drainage lines, 1-3%. Normal gilgai may be present.	Deep, black and brown, non cracking clays (minor cracking clays) with hardsetting surfaces; light clay, medium A horizons; medium clay B horizons, often with quartz grains; alkaline soil reaction trend. Brown Dermosols	Eucalypt shrubby woodland or brigalow belah forest. Narrow-leaved ironbark, silver-leaved ironbark, Queensland blue gum, brigalow, wilga, bottle trees and wattles.	III m3, ps3, tm2, e3

LAND SYSTEM - HUTTON 2 (Ht2)

General Description: Undulating low hills on sedimentary rocks. Major soils are shallow to deep, brown, yellow and grey, sodic duplex soils (Sodosols).
Geology: Hutton Sandstone/Mulgildie Coalmeasures - Sandstone, siltstone, shale and mudstone.
Landform: Undulating low hills with minor slightly steeper hills.
Vegetation: Eucalypt woodland, limited to extensive clearing. Narrow-leaved ironbark, silver-leaved ironbark, poplar box, gum topped box, Queensland blue gum, Moreton Bay ash with minor false sandalwood and bulloak.



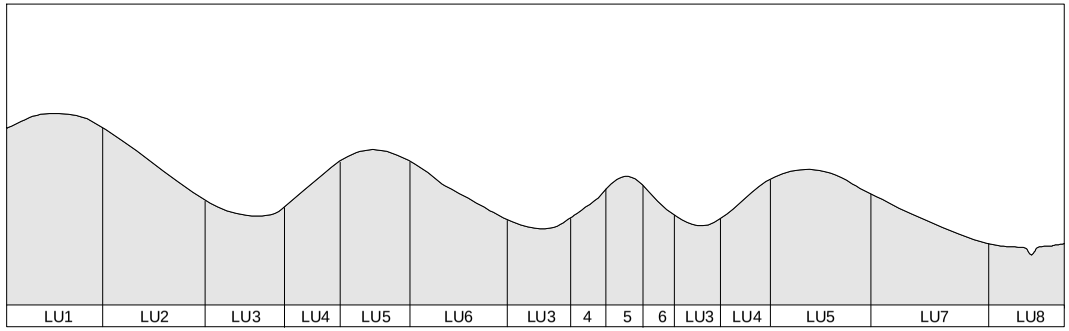
Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	5	Crests, ridges and upper slopes, 2-8%.	Moderately deep to deep, brown and grey, sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium A horizons, with bleached A2 horizons; medium clay B horizons; alkaline soil reaction trend. Brown and Grey Sodosols.	Eucalypt woodland. Poplar box, narrow-leaved ironbark, silver-leaved ironbark, bulloak and false sandalwood.	VI m6, pd4, ps3, nd3, sa2-3, e6
LU2	10	Long, mid to lower slopes, 3-5%.	Deep, brown, sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium A horizons, with bleached A2 horizons; light to medium clay B horizons; alkaline soil reaction trend. Brown Sodosols.	Eucalypt woodland. Poplar box.	VI m6, pd4, ps3, nd3, sa3, e6
LU3	5	Lower, long slopes, 1-3%.	Deep, grey and brown, sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium A horizons, with bleached A2 horizons; light to medium clay B horizons; alkaline soil reaction trend. Grey and Brown Sodosols.	Eucalypt woodland. Gum topped box with occasional false sandalwood.	VI m6, pd4, ps3, nd3, sa3, e6
LU4	15	Short midslopes, 5-10%.	Shallow to moderately deep, brown, sodic duplex soils and gradational soils with hardsetting surfaces; fine sandy loam to clay loam, medium A horizons, usually with bleached A2 horizons; light to medium clay B horizons; neutral to alkaline soil reaction trend. Brown Sodosols and Dermosols.	Eucalypt open woodland to woodland. Gum topped box, poplar box, narrow-leaved ironbark, Queensland blue gum, Moreton Bay ash, beefwood and false sandalwood.	VI m6, pd4, ps3, nd3, sa3, e6

HUTTON 2 (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU5	10	Lower concave slopes, 3-5%.	Moderately deep to deep, sometimes mottled, black, grey and brown sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium to thick A horizons, usually with bleached A2 horizons; light clay to light medium clay B horizons; neutral to alkaline soil reaction trend. Black, Grey and Brown Sodosols.	Eucalypt open woodland to woodland. Poplar box, silver-leaved ironbark, gum topped box, Queensland blue gum and wilga.	VI m6, pd2-4, ps3, nd3, sa3, e6
LU6	20	Ridges, 3-6% slope.	Moderately deep to deep, brown and yellow, sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium to thick A horizons, with bleached A2 horizons; light to light medium clay B horizons; ironstone gravel may be present on top of B horizons; alkaline soil reaction trend. Brown and Yellow Sodosols.	Eucalypt woodland. Gum topped box, narrow-leaved ironbark, silver-leaved ironbark and poplar box.	VI m6, pd2-4, ps3, nd3, sa3, e6
LU7	15	Midslopes, 6-12%.	Moderately deep to deep, grey and brown, (sometimes mottled), sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium A horizons, with bleached A2 horizons; light to light medium clay B horizons; alkaline soil reaction trend (occasionally acid). Grey and Brown Sodosols.	Eucalypt woodland. Narrow-leaved ironbark, Moreton Bay ash, bloodwoods, beefwood and red ash.	VI m6, pd4, ps3, nd3, sa3, e6
LU8	20	Higher crests and upper slopes, 5-8%. Rock outcrop common.	Shallow to moderately deep, often mottled, brown and grey, sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, medium A horizons, usually with bleached A2 horizons; light clay to light medium clay B horizons; neutral to alkaline soil reaction trend (occasionally acid). Brown and Grey Sodosols.	Eucalypt woodland. Narrow-leaved ironbark, silver-leaved ironbark, gum topped box, Moreton Bay ash, beefwood and red ash.	VI m6, pd3-4, ps3, nd3, sa3, r2-4, e6

LAND SYSTEM - CASWELL 2 (Cw2)

General Description: Undulating low hills with minor rolling low hills on sedimentary rocks. Major soils are moderately deep to deep, brown, red and grey, sodic duplex soils shallow to deep, red and brown, gradational soils and non cracking clays (Sodosols, Chromosols and Dermosols).
Geology: Caswell Creek Group and Crana Beds - Mudstone, siltstone, arenite, conglomerate, rare andesite and oolitic limestone.
Landform: Undulating low hills with minor rolling low hills.
Vegetation: Eucalypt woodland, limited to completely cleared. Silver-leaved ironbark, Moreton Bay ash, narrow-leaved ironbark and poplar box.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	5	Higher crests and upper slopes, 3-15%.	Very shallow to shallow, red, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay, thin to medium A horizons; light clay B horizons; common to abundant, medium to coarse gravel throughout profile; neutral soil reaction trend. Red Dermosols.	Eucalypt woodland. Silver-leaved ironbark, gum topped bloodwood and narrow-leaved ironbark.	VI m6, pd3-4, ps3, nd3, r2-3, e6
LU2	5	Mid slopes, 5-8%.	Moderately deep to deep, red and brown, cracking and non cracking clays with hardsetting surfaces; light clay, medium A horizons; light to medium clay B horizons, common, medium gravel may be present, especially at depth; alkaline soil reaction trend. Red and Brown Vertosols and Dermosols.	Eucalypt woodland. Poplar box, Moreton Bay ash and silver-leaved ironbark.	III-IV m3-4, pm3, e3
LU3	15	Lower slopes, 3-5%.	Deep, brown and grey, sodic duplex soils with hardsetting surfaces; clay loam, medium to thick A horizons, with bleached A2 horizons; medium clay B horizons; few to common, fine gravel usually throughout profile; alkaline soil reaction trend. Brown and Grey Sodosols.	Eucalypt woodland. Silver-leaved ironbark, narrow-leaved ironbark and poplar box.	VI m6, pd3, ps3, nd3, sa3, e4
LU4	25	Mid and lower slopes, 5-10%.	Moderately deep, red and brown, sodic duplex soils with hardsetting surfaces; clay loam, medium A horizons, usually with bleached A2 horizons; medium clay B horizons, usually with many to common fine to medium gravel; alkaline soil reaction trend. Red and Brown Sodosols.	Eucalypt woodland. Silver-leaved ironbark, minor narrow-leaved ironbark and Moreton Bay ash.	VI m6, pd3-4, ps3, sa3, nd3, e4

CASWELL 2 (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU5	20	Crests, ridges and upper slopes, 5-10%.	Shallow, brown and red, sodic duplex and gradational soils with hardsetting surfaces; clay loam, thin to medium A horizons; light to medium clay B horizons, with few to common, fine to medium gravel; neutral soil reaction trend. Brown and Red Dermosols and Chromosols.	Eucalypt woodland. Silver-leaved ironbark and narrow-leaved ironbark.	IV or VI m4 or 6, pd3-4, ps3, nd3, e3-4 or 6
LU6	20	Midslopes, 4-10%.	Shallow to moderately deep, red and brown, gradational soils, sodic duplex soils and minor non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons; light clay to medium clay B horizons; few to common fine to medium gravel may be present especially at depth; neutral to alkaline soil reaction trend. Red and Brown Dermosols, Chromosols and Sodosols.	Eucalypt woodland. Silver-ironbark and Moreton Bay ash.	IV or VI m4 or 6, pd2-3, ps3, nd3, e3-4
LU7	5	Mid and lower slopes, 3-5%. Medium gravel or pebbles may be present on surface.	Deep, brown, non cracking clays and gradational soils with hardsetting surfaces; clay loam to light clay, thin to medium A horizons; light to medium clay B horizons; few to many, fine to medium gravel may be present throughout profile; alkaline soil reaction trend. Brown Dermosols.	Eucalypt woodland. Poplar box and silver-leaved ironbark.	III-IV m3-4, ps3, nd3, r2, e3.
LU8	5	Lower slopes and drainage lines, 1-6%.	Deep, brown, non cracking clays, gradational soils and sodic duplex soils with hardsetting surfaces; clay loam to light clay, medium to thick A horizons, usually with bleached A2 horizons; light to medium clay B horizons, often with fine to medium gravel; alkaline soil reaction trend. Brown Dermosols and Sodosols.	Eucalypt woodland. Poplar box, Queensland blue gum, Moreton Bay ash, silver-leaved ironbark and rough barked apple.	IV m3-4, ps3, pd2-4, nd3, e3-4

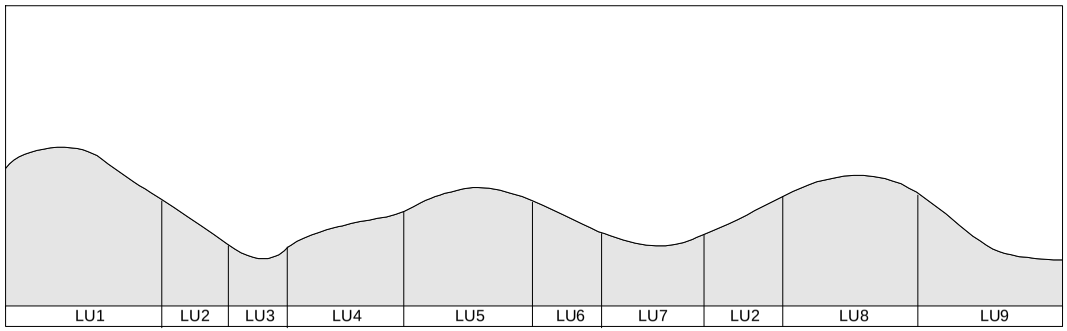
LAND SYSTEM - EVERGREEN 6 (Eg6)

General Description: Undulating low hills on sedimentary rocks. Major soils are moderately deep to deep, red and brown, non cracking clays, gradational and sodic duplex soils and grey, cracking clays (Dermosols, Chromosols and Vertosols).

Geology: Evergreen Formation - Labile to sublabile sandstone.

Landform: Undulating low hills.

Vegetation: Eucalypt woodland and eucalypt shrubby woodland, extensively to completely cleared. Narrow-leaved ironbark, silver-leaved ironbark, gum topped box, spotted gum, Queensland blue gum, brigalow, wilga, false sandalwood, red ash and bottle trees.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	10	Crests, upper and mid slopes, 2-8%. Rock outcrop may occur.	Shallow to moderately deep, red and brown, gradational and sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium A horizons; light to light medium clay B horizons; neutral to alkaline soil reaction trend. Brown Dermosols and Chromosols.	Eucalypt woodland. Narrow-leaved ironbark, Moreton Bay ash, spotted gum, silver-leaved ironbark, bloodwoods, often with wilga and wattles.	VI or VI m4 or 6, pd2-3, ps3, nd2, r1-3, e4
LU2	15	Midslopes, 5-10%.	Moderately deep to deep, red and brown, non cracking clays and gradational and sodic duplex soils with hardsetting surfaces; clay loam to light clay, medium A horizons; light clay to medium clay B horizons; neutral to alkaline soil reaction trend. Red and Brown Dermosols and Chromosols.	Eucalypt shrubby woodland. Silver-leaved ironbark, gum topped box, spotted gum, wilga, red ash and bottle trees.	IV or VI m4 or 6, pd2-3, ps3, nd2, e4 or 6
LU3	5	Major drainage lines, 1-3%.	Deep, often mottled, red and brown, sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, thick to very thick A horizons, often with bleached A2 horizons; sandy, light to medium clay B horizons; neutral soil reaction trend. Red and Brown Chromosols.	Eucalypt woodland. Queensland blue gum and rusty gum.	VI m6, nd2, e6

EVERGREEN 6 (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU4	20	Midslopes, 5-10%.	Moderately deep, red and brown, non cracking clays and gradational soils with hardsetting surfaces; clay loam to light clay, medium A horizons; light clay to light medium clay B horizons; neutral soil reaction trend. Red and Brown Dermosols.	Eucalypt shrubby woodland. Silver-leaved ironbark, brigalow, gum topped box, wilga and false sandalwood.	IV m4, pd3, ps3, nd2, e3
LU5	15	Crests and upper slopes, 5-10%. Rock outcrop may occur.	Moderately deep, red and brown, non cracking clays and gradational soils with hardsetting surfaces; clay loam to light clay, medium A horizons; light clay to light medium clay B horizons; neutral soil reaction trend. Red and Brown Dermosols.	Eucalypt shrubby woodland. Brigalow, silver-leaved ironbark, poplar box, Queensland blue gum and wilga.	IV m3-4, ps3, nd2, r1-3, e3
LU6	10	Midslopes, 5-10%.	Moderately deep to deep, brown, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons; light clay to light medium clay B horizons; ironstone gravel may be present in profile; alkaline soil reaction trend. Brown Dermosols.	Eucalypt woodland. Poplar box, Queensland blue gum and wilga.	IV m3-4, ps3, nd2, e3
LU7	5	Lower concave slopes, 3-6%.	Deep, red and brown, sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium A horizons, with bleached A2 horizons; light to medium clay B horizons, often with gravel; neutral to alkaline soil reaction trend. Red and Brown Sodosols.	Eucalypt shrubby woodland. Gum topped box, silver-leaved ironbark, bottle trees and wilga.	VI m6, pd4, ps3, nd2, sa2, e4
LU8	10	Crests and upper slopes, 3-8%. Rock outcrop may occur.	Shallow to moderately deep, brown, non cracking clays with hardsetting surfaces; light clay, medium A horizons, usually with bleached A2 horizons, and small pebbles; light clay B horizons with gravel at depth; neutral soil reaction trend. Brown Dermosols.	Forest. Brigalow and “softwood scrub” species.	IV or VI m4 or 6, pd3-4, ps3, nd2, r1-3, e3
LU9	10	Mid and lower slopes, 5-10%.	Moderately deep to deep, grey, cracking clays with hardsetting surfaces; light clay A horizons; medium clay B horizons; neutral to alkaline soil reaction trend. Grey Vertosols.	Shrubby woodland. Brigalow, belah and gum topped box.	III m3, pm2, sa3 e3

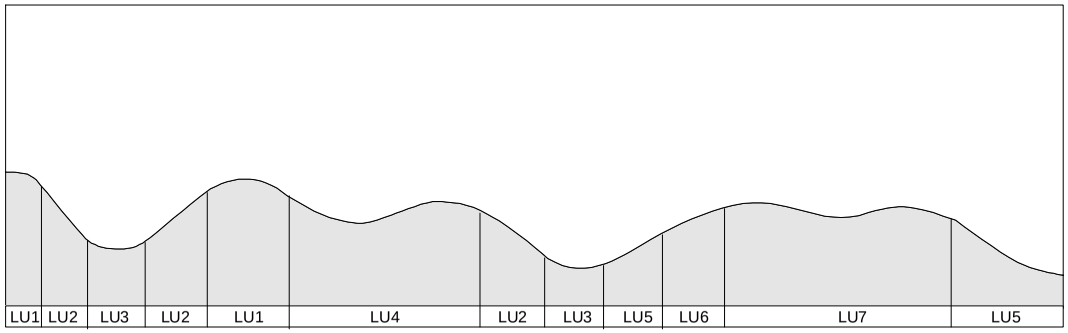
LAND SYSTEM - EVERGREEN 7 (Eg7)

General Description: Undulating low hills on fresh and deeply weathered sediments. Major soils are shallow to deep, red and brown, gradational soils and non cracking clays, and moderately deep to deep, red and brown, cracking clays (Dermosols and Vertosols).

Geology: Evergreen Formation - Oolitic ironstone, labile to sublabile sandstone, siltstone, shale and oolitic ironstone.

Landform: Undulating low hills.

Vegetation: Eucalypt and eucalypt shrubby open forest, limited to extensive clearing. Poplar box, silver-leaved ironbark, narrow-leaved ironbark, Moreton Bay ash, bloodwoods, wilga, red ash, false sandalwood and brigalow.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	10	Crests and upper slopes, 3-5%. Stone may be present on surface.	Shallow to moderately deep, red and brown, gradational soils with hardsetting surfaces; sandy clay loam to clay loam, medium to thick A horizons, sometimes with gravel; light clay B horizons, often with ironstone gravel; acid to neutral soil reaction trend. Red and Brown Dermosols.	Eucalypt shrubby woodland. Narrow-leaved ironbark, bloodwoods, red ash and wilga.	IV m4, ps3, r3-4, e3
LU2	15	Midslopes, 5-10%. Coarse gravel usually common on surface.	Moderately deep to deep, brown, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons; medium clay B horizons; alkaline soil reaction trend. Brown Dermosols.	Eucalypt shrubby open forest. Poplar box, silver-leaved ironbark, Moreton Bay ash and wilga.	III-IV m3-4, ps3, r2, e3
LU3	10	Lower concave slopes, 4-8%.	Moderately deep to deep, brown, non cracking clays with hardsetting surfaces; light clay medium A horizons; light clay B horizons, sometimes over sandy D horizons; neutral to alkaline soil reaction trend. Brown Dermosols.	Eucalypt woodland. Poplar box and silver-leaved ironbark.	III-IV m3-4, ps3, e2-3

EVERGREEN 7 (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU4	15	Broad crests, upper and midslopes, 3-8%. Gravel may be present on surface.	Deep, brown, non cracking clays with hardsetting surfaces; light clay, medium A horizons; medium clay B horizons; ironstone gravel usually present throughout; alkaline soil reaction trend. Brown Dermosols.	Eucalypt shrubby open forest. Silver-leaved ironbark, poplar box, Moreton Bay ash, brigalow, false sandalwood and wilga.	III m3, ps3, r2, e3
LU5	20	Lower slopes, 2-4%.	Deep, red and brown, cracking clays with hardsetting to self mulching surfaces; light to light medium clay A horizons; light to medium clay B horizons; neutral to alkaline soil reaction trend. Red and Brown Vertosols.	Eucalypt open woodland. Moreton Bay ash, narrow-leaved ironbark and Queensland blue gum.	III m3, pm2, e2
LU6	10	Mid slopes, 5-8%.	Deep, brown and yellow, non sodic duplex soils, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons; light to medium clay B horizons, acid to neutral soil reaction trend. Yellow Dermosols and Ferrosols.	Eucalypt open woodland. Narrow-leaved ironbark, Queensland blue gum and Moreton Bay ash.	III-IV m3, ps3, e3
LU7	20	Crests and upper slopes, 3-8%. Pebbles and stone may be present on surface.	Shallow to deep, red, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium to thick, weakly to moderately structured A horizons; light clay B horizons, usually with ironstone gravel at depth; acid to neutral soil reaction trend. Red Ferrosols.	Eucalypt woodland. Narrow-leaved ironbark, spotted gum, bloodwoods, Moreton Bay ash and gum topped box.	III-IV m3-4, pd2-3, ps3, r1-3, e2-3

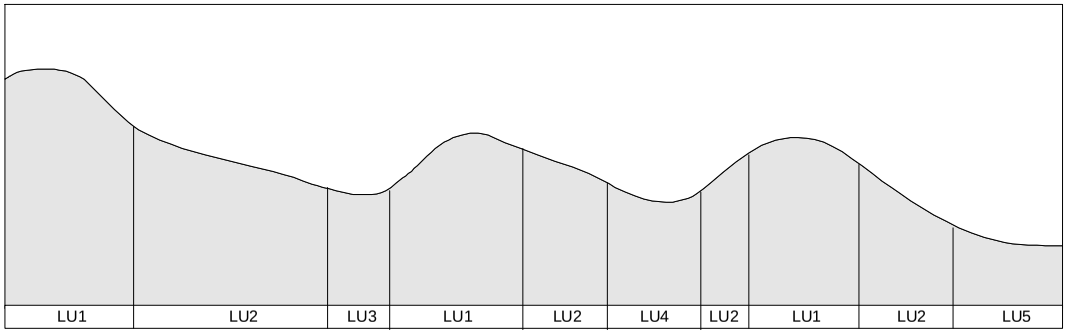
LAND SYSTEM - EVERGREEN 8 (Eg8)

General Description: Undulating low hills on sedimentary rocks. Major soils are shallow to moderately deep, grey, sodic duplex soils and deep, black and grey, cracking clays (Sodosols and Vertosols).

Geology: Evergreen Formation - Labile to sublabile sandstone.

Landform: Undulating low hills.

Vegetation: Eucalypt open woodland to woodland, usually extensively cleared. Narrow-leaved ironbark, gum topped box, Queensland blue gum, poplar box and Moreton Bay ash.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	40	Crests, ridges and upper slopes, 3-12%. Few to many pebbles on surface. Rock outcrop may occur.	Shallow to moderately deep, grey, sodic duplex soils with hardsetting surfaces; sandy loam to clay loam, medium A horizons, with bleached A2 horizons; medium clay B horizons; alkaline soil reaction trend. Grey Sodosols.	Eucalypt woodland. Narrow-leaved ironbark, gum topped box, often with understorey of corkwood.	VI m6, pd3-4, ps3, nd2, a3, r2-4, e4 or 6
LU2	40	Mid slopes, 3-10%. Many to abundant surface coarse fragments. Rock outcrop may occur.	Shallow to moderately deep, grey, sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, thin to medium A horizons, usually with bleached A2 horizons; light to medium clay B horizons; neutral to alkaline (occasionally acid) soil reaction trend. Grey Sodosols.	Eucalypt woodland. Gum topped box and narrow-leaved ironbark.	VI m6, pd3-4, ps3, nd2, sa3, r2-4, e4 or 6
LU3	5	Lower slopes and drainage lines, 2-5%.	Moderately deep to deep, grey, sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium A horizons, with bleached A2 horizons; medium clay B horizons; neutral to alkaline soil reaction trend. Grey Sodosols.	Eucalypt open woodland to woodland. Queensland blue gum, Moreton Bay ash and gum topped box.	VI m6, pd3-4, ps3, nd2, sa3, e3
LU4	5	Lower slopes and drainage lines, 2-4%.	Deep, black and grey, cracking clays with hardsetting surfaces; light clay A horizons; medium clay B horizons; alkaline soil reaction trend. Black and Grey Vertosols.	Eucalypt open woodland. Gum topped box.	III m3, pm2, sa2, e2
LU5	10	Lower slopes and broad drainage lines, 2-4% slope.	Deep, black and grey, cracking clays with self mulching to hardsetting surfaces; light clay A horizons; light to medium clay B horizons; alkaline soil reaction trend. Black and Grey Vertosols.	Eucalypt woodland. Poplar box and Moreton Bay ash.	III m3, pm2, sa2, e2

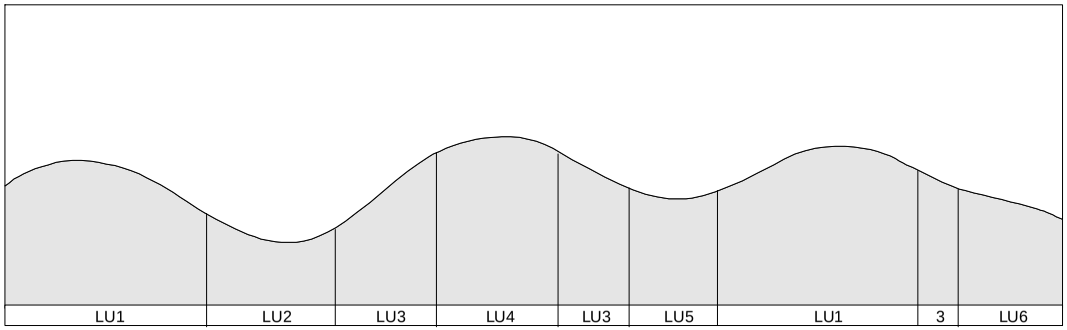
LAND SYSTEM - EVERGREEN 9 (Eg9)

General Description: Undulating low hills on sedimentary rocks. Major soils are shallow to moderately deep, red and brown, non sodic duplex soils and moderately deep to deep, brown and grey, sodic duplex soils and gradational soils (Chromosols, Sodosols and Dermosols).

Geology: Evergreen Formation - Siltstone, sublabile sandstone and mudstone.

Landform: Undulating low hills.

Vegetation: Eucalypt shrubby woodland and woodland, usually with limited clearing. Spotted gum, narrow-leaved ironbark, gum topped box, Queensland blue gum, Moreton Bay ash, poplar box, wattles and red ash.



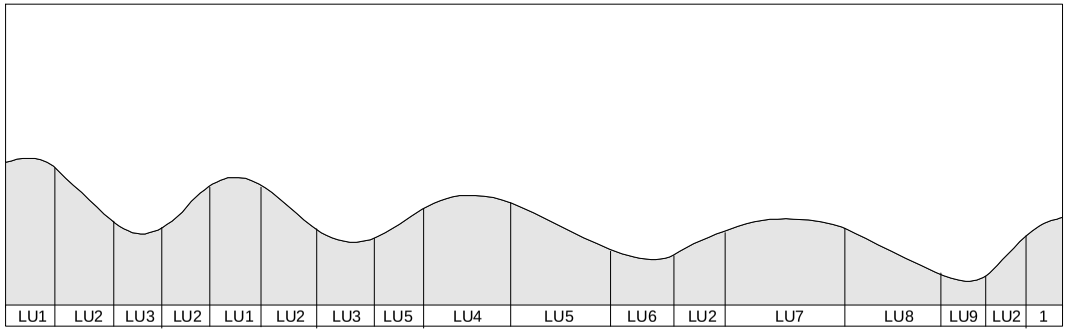
Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	30	Crests, upper and mid slopes, 5-12%.	Shallow to moderately deep, red and brown, non sodic duplex soils with hardsetting surfaces; sandy loam to clay loam, medium A horizons, occasionally with bleached A2 horizons, often with ironstone gravel; medium clay B horizons, often with common to abundant sandstone fragments, especially at depth; acid soil reaction trend. Red and Brown Chromosols.	Eucalypt shrubby woodland. Spotted gum, gum topped box, narrow-leaved ironbark, wattles and red ash.	IV or VI m4 or 6, ps3, e3-4
LU2	<5	Lower concave slopes, 3-6%.	Deep, brown, sodic duplex and gradational soils with hardsetting surfaces; sandy clay loam to clay loam, medium A horizons, with bleached A2 horizons; often with ironstone gravel on top of B horizons; light to medium clay B horizons, often mottled at depth; alkaline soil reaction trend. Brown Sodosols and Dermosols.	Eucalypt woodland. Gum topped box.	VI m6, pd3-4, ps3, e3-4
LU3	30	Midslopes, 5-10%.	Moderately deep to deep, often mottled, brown and grey, non sodic and sodic duplex soils with hardsetting surfaces; sandy loam to clay loam, medium A horizons, occasionally with bleached A2 horizons; light clay to medium clay B horizons; acid soil reaction trend. Brown and Grey Chromosols and Sodosols.	Eucalypt woodland. Narrow-leaved ironbark, gum topped box, spotted gum, silver-leaved ironbark, red ash and wattles.	IV or VI m4 or 6, pd3-4, ps3, e3-4

EVERGREEN 9 (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU4	20	Higher crests and upper slopes, 5-10%. Rock outcrop common.	Very shallow to shallow, red and brown, non sodic duplex soils with hardsetting surfaces; sandy loam to clay loam, medium A horizons; light clay to light medium clay B horizons; acid soil reaction trend. Red and Brown Chromosols.	Eucalypt woodland. Spotted gum, narrow-leaved ironbark, gum topped box, red ash and wattles.	VI m6, pd3-4, ps3, r2-4, e4
LU5	10	Lower concave slopes, 3-6%.	Moderately deep to deep, yellow and brown, sodic duplex and gradational soils with hardsetting surfaces; sandy clay loam to clay loam, medium A horizons, with bleached A2 horizons; light clay to medium clay B horizons; alkaline soil reaction trend. Yellow and Brown Chromosols and Dermosols.	Eucalypt shrubby woodland. Queensland blue gum, Moreton Bay ash, silver-leaved ironbark, red ash, wattles and "softwood scrub" species.	VI m4 or 6, pd2-4, ps3, e3-4
LU6	5	Lower longer slopes, 4-6% slope.	Deep, brown, gradational and sodic duplex soils with hardsetting surfaces; clay loam, medium A horizons, with bleached A2 horizons; light to medium clay B horizons; neutral to alkaline soil reaction trend. Brown Dermosols and Chromosols.	Eucalypt woodland. Poplar box.	VI m6, pd3-4, ps3, e3-4

LAND SYSTEM - HARRAMI (Hr)

General Description: Undulating low hills with minor rolling low hills on sedimentary rocks, metasediments and intermediate volcanic rocks. Major soils are shallow to moderately deep, red, gradational soils and non cracking clays and red, brown and black, cracking clays (Dermosols and Vertosols).
Geology: Rannes Beds/Wingfield Adamallite/Youlambie Conglomerate - Siltstone, mudstone, schist, chert, gabbro andesite, adamellite.
Landform: Undulating low hills with smaller areas of rolling low hills.
Vegetation: Eucalypt woodland, extensively cleared. Silver-leaved ironbark, bloodwoods, Moreton Bay ash and Queensland blue gum.



LandUnit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	5	Ridges, crests and upper slopes, 3-8%. Rock outcrop and few surface cobble may be present.	Shallow to moderately deep, red, gradational soils and non cracking clays with firm to hardsetting surfaces; clay loam to light clay, medium A horizons; light to medium clay B horizons; small to medium pebbles may be present throughout profile; neutral soil reaction trend. Red Dermosols.	Eucalypt woodland. Silver-leaved ironbark, bloodwoods, Moreton Bay ash and narrow-leaved ironbark.	IV m4, pd2-3, ps3, nd2, r2-4, e3
LU2	20	Midslopes, 3-8%, some higher slopes up to 12%. Rock outcrop may occur.	Shallow to moderately deep (occasionally deep), red, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons; light to medium clay B horizons; neutral to alkaline soil reaction trend. Red Dermosols.	Eucalypt woodland. Silver-leaved ironbark.	IV m4, pd2-3, ps3, nd2, r2-3, e3-4
LU3	5	Lower concave slopes, 3-6%.	Moderately deep to deep, black, grey and brown (occasionally red), non cracking clays and sodic duplex soils with hardsetting surfaces; clay loam to light clay medium A horizons, frequently with bleached A2 horizons; medium clay B horizons; alkaline soil reaction trend. Black, Grey and Brown Dermosols and Sodosols.	Eucalypt woodland. Poplar box, silver-leaved ironbark, Moreton Bay ash and wilga.	IV m3-4, ps3, nd2, e4
LU4	10	Lower ridges, crests and upper slopes, 3-6%.	Shallow to moderately deep, brown and red, (lower B horizons are brown), gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay A horizons; light to light medium clay B horizons; alkaline soil reaction trend. Brown and Red Dermosols.	Eucalypt woodland. Silver-leaved ironbark.	IV m4, pd2-3, ps3, nd2, e2-3

HARRAMI (continued)

LandUnit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU5	10	Midslopes, 3-8%.	Moderately deep to deep, brown and red, (lower B horizons are brown), gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons; light to medium clay B horizons; neutral to alkaline soil reaction trend. Brown and Red Dermosols.	Eucalypt woodland. Silver-leaved ironbark, Moreton Bay ash, poplar box, bloodwoods and narrow-leaved ironbark.	IV m4, ps3, nd2, e3
LU6	5	Lower concave slopes major drainage lines, 1-3% slope.	Deep, black and brown, non cracking clays and gradational soils with hardsetting surfaces; clay loam to light clay, medium A horizons; light to medium clay B horizons, often over coarse sand to clay D horizons below 0.6 m; neutral to alkaline soil reaction trend. Black and Brown Dermosols.	Eucalypt woodland. Poplar box, Queensland blue gum, rusty gum and silver-leaved ironbark.	IV m3-4, ps3, nd2, e4
LU7	30	Broad ridges, crests and upper slopes, 3-6%. Minor rocks, pebbles and stone may be present on surface. Linear gilgai may be present.	Shallow to moderately deep, red and brown (sometimes black), cracking clays (minor non cracking clays) with self mulching to hardsetting surfaces; light clay A horizons; medium clay B horizons; neutral to alkaline soil reaction trend. Red and Brown Vertosols (minor Dermosols).	Eucalypt woodland. Silver-leaved ironbark, bloodwoods, Moreton Bay ash and poplar box.	III-IV m3-4, pd2-3, pm2, r1-3, tm2, e2-3.
LU8	15	Midslopes, 4-8%. Minor rock outcrop. Pebbles may be present on surface. Linear gilgai may be present.	Shallow to moderately deep, black and brown, cracking clays with self mulching surfaces; light to light medium clay A horizons; medium clay B horizons; alkaline soil reaction trend. Black and Brown Vertosols.	Eucalypt woodland. Silver-leaved ironbark and bloodwoods.	III-IV m3-4, pd2-3, pm2, r1-3, tm2, e2-3
LU9	5	Lower slopes and drainage lines, 1-3%. Linear gilgai may be present.	Deep, black cracking clays with self mulching surfaces; medium clay A horizons; medium to heavy clay B horizons; alkaline soil reaction trend. Black Vertosols.	Eucalypt open woodland. Queensland blue gum.	III m2, pm2, tm2, e3.

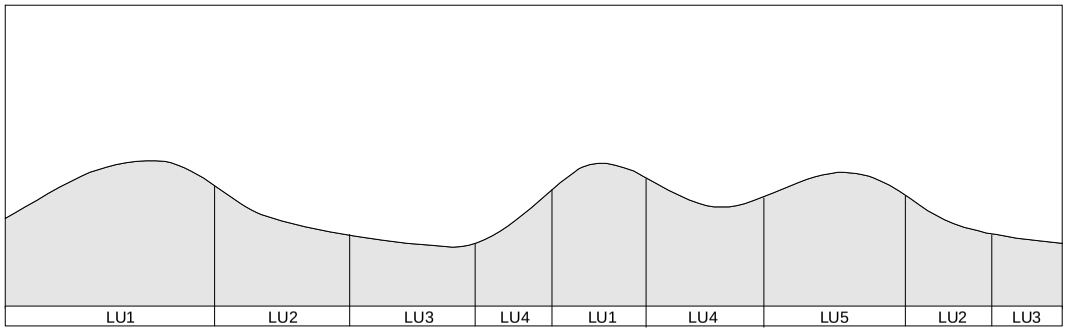
LAND SYSTEM - MONAL 1 (Mn1)

General Description: Undulating low hills to rolling low hills on sedimentary rocks. Major soils are very shallow to shallow, red and brown, non sodic and sodic duplex soils and gradational soils, moderately deep to deep, red and brown, non cracking clays and gradational and sodic duplex soils and deep, black cracking clays (Chromosols, Sodosols, Dermosols and Vertosols).

Geology: Dawes Range Formation - Lithic arenite, siltstone, conglomerate, andesitic lava, tuff, agglomerate.

Landform: Undulating low hills to rolling low hills.

Vegetation: Eucalypt woodland, usually extensively cleared. Narrow-leaved ironbark, silver-leaved ironbark, Moreton Bay ash, Queensland blue gum.



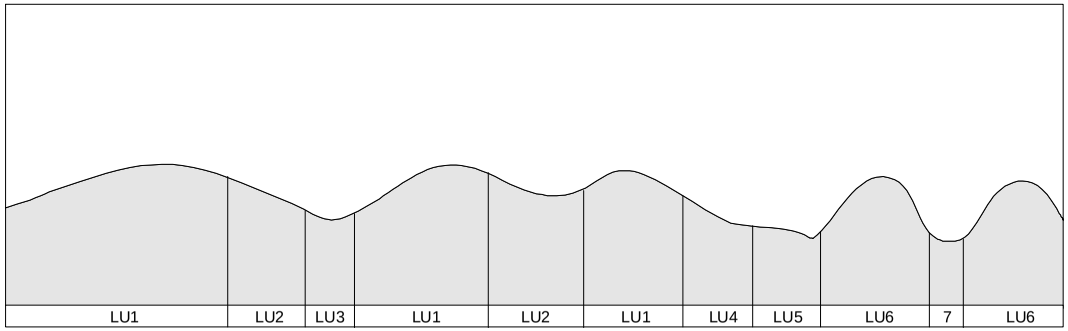
Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	30	Crests and upper slopes, 5-15%. Common to abundant rock outcrop. Large pebbles or cobbles.	Very shallow to shallow, red, sodic and non sodic duplex soils and gradational soils with hardsetting surfaces; loam to clay loam, medium A horizons; light clay B horizons; medium to coarse gravel usually throughout profile; acid to neutral soil reaction trend. Red Chromosols and Dermosols.	Eucalypt woodland. Narrow-leaved ironbark with occasionally spotted gum.	VI-VII m4 or 6, pd3-4, ps3, r4-5, e4-6
LU2	25	Midslopes, 5-10%.	Moderately deep to deep, red and brown, non cracking clays and gradational soils with hardsetting surfaces; clay loam to light clay, medium A horizons; medium clay B horizons; fine gravel may be present in profile; neutral to alkaline soil reaction trend. Red and brown Dermosols.	Eucalypt woodland. Silver-leaved ironbark and Moreton Bay ash.	IV m3, ps3, nd3, e3-4
LU3	15	Lower concave slopes and drainage lines, 1-3%. Normal gilgai or sometimes linear gilgai present.	Deep, black, cracking clays with self mulching surfaces; medium clay A horizons; medium to heavy clay B horizons; alkaline soil reaction trend. Black Vertosols.	Eucalypt open woodland. Queensland blue gum.	III m2, pm3, tm2-3, e2, f2

MONAL 1 (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU4	15	Mid and lower concave slopes, 4-8%.	Moderately deep to deep, black and brown, sodic duplex soils with hardsetting surfaces; clay loam, medium A horizons usually with bleached A2 horizons; medium clay B horizons; often few to common, fine to medium gravel throughout profile; neutral to alkaline soil reaction trend. Black and Brown Sodosols.	Eucalypt woodland. Narrow-leaved ironbark, Moreton Bay ash, silver-leaved ironbark and Queensland blue gum.	VI m6, ps3, nd3, sa3, e4
LU5	15	Lower crests, 3-10% slope. Many to abundant surface cobble. Rock outcrop.	Very shallow to shallow, red, sodic and non sodic duplex soils and gradational soils with hardsetting surfaces; loam to clay loam, medium A horizons; light clay B horizons; acid to neutral soil reaction trend. Red Chromosols and Dermosols.	Eucalypt woodland. Silver-leaved ironbark and narrow-leaved ironbark.	VI m6, pd3-4, ps3, nd3, r3-4, e6

LAND SYSTEM - YOULAMBIE (Yb)

General Description: Rolling low hills on sedimentary rocks. Major soils are stony, shallow, uniform, medium textured soils over rock and brown and red, gradational soils, and moderately deep, red, brown and yellow, non sodic and sodic duplex soils (Tenosols, Rudosols, Dermosols, Chromosols and Sodosols).
Geology: Youlambie Conglomerate - Conglomerate, lithic and feldspathic arenite, siltstone conglomeratic mudstone, acid lava and tuff.
Landform: Rolling low hills.
Vegetation: Eucalypt woodland, limited to extensive clearing. Narrow-leaved ironbark, silver-leaved ironbark, Moreton Bay ash and Queensland blue gum.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	30	Ridge crests and slopes, 10-20%. Surface stone common to abundant.	Very shallow to shallow, stony, uniform, medium textured soils over rock and shallow, brown to red, gradational soils with hardsetting surfaces; clay loam, medium A horizons; light clay B horizons; cobble and stone throughout profile; acid to neutral soil reaction trend. Leptic Tenosols and Rudosols and Brown to Red Dermosols.	Eucalypt woodland. Narrow-leaved ironbark, Moreton Bay ash and silver-leaved ironbark.	VI-VII m6, pd4 or 6, nd2, ts6, r3-4, e6-7
LU2	20	Mid and upper lower slopes, 10-15%. Surface stone usually present.	Shallow to moderately deep, brown to yellow, non sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium A horizons, often with bleached A2 horizons; light to light medium clay B horizons; cobble usually throughout profile; acid to neutral soil reaction trend. Brown and Yellow Chromosols.	Eucalypt woodland. Narrow-leaved ironbark, Queensland blue gum and Moreton Bay ash.	V1 m4 or 6, pd3-4, ps3, nd2, ts4, r3, e6
LU3	5	Lower slopes, 10-15%.	Moderately deep, brown and yellow, sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium to thick A horizons, with bleached A2 horizons; light medium clay B horizons, usually with rock fragments; neutral to alkaline soil reaction trend. Brown and Yellow Sodosols.	Eucalypt woodland. Gum topped box, narrow-leaved ironbark and Moreton Bay ash.	V1 m4 or 6, pd3-4, ps3, nd2, e6

YOULAMBIE (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU4	10	Mid to lower slopes, 10-15%.	Moderately deep, brown and yellow, sodic duplex soils with hardsetting surfaces; fine sandy loam to clay loam, medium A horizons, with bleached A2 horizons; medium clay B horizons, sometimes gravelly; alkaline soil reaction trend. Brown and Yellow Sodosols and Chromosols.	Eucalypt woodland. Silver-leaved ironbark and Queensland blue gum.	VI m4 or 6, pd2-3, ps3, nd2, r2-3, e6
LU5	<5	Lower slopes and drainage depressions, 1-2%.	Deep, brown, sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium A horizons, with bleached A2 horizons; medium clay B horizons; alkaline soil reaction trend. Brown Sodosols.	Eucalypt open woodland. Queensland blue gum, smooth barked apple and narrow-leaved ironbark.	VI m6, pd2-3, ps2, nd2, sa2, e6
LU6	30	Ridge crests and steep slopes, 30-50%. Surface stone common to abundant.	Very shallow to shallow, stony, uniform, medium textured soils over rock, and shallow, brown to red, gradational soils with hardsetting surfaces; clay loam, medium A horizons; light clay B horizons; cobble and stone throughout profile; acid to neutral soil reaction trend. Leptic Tenosols and Rudosols and Brown to Red Dermosols.	Eucalypt woodland. Narrow-leaved ironbark, Moreton Bay ash and silver-leaved ironbark.	VII-VIII m6, pd4 or 6, ps3, nd2, ts7-8, r4-5, e6-7
LU7	<5	Flat drainage depressions and valley floors, 0-1%.	Moderately deep to deep, black and brown, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons, occasionally with bleached A2 horizons; light to light medium clay B or D horizons; neutral to alkaline soil reaction trend. Black and Brown Dermosols.	Eucalypt open woodland. Queensland blue gum, Moreton Bay ash, rough barked apple and narrow-leaved ironbark.	VI m3-4, ps3, nd2, e4 or 6, f2-3

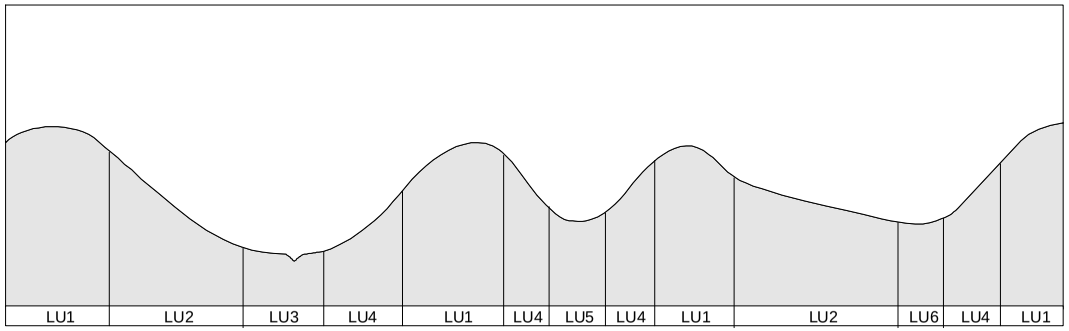
LAND SYSTEM - CASWELL 3 (Cw3)

General Description: Rolling low hills on sedimentary rocks. Major soils are very shallow to shallow, stony, medium textured soils and red and brown, sodic duplex soils and moderately deep to deep, brown, sodic duplex soils, and red, gradational soils and non cracking clays (Rudosols, Tenosols, Sodosols, Chromosols and Dermosols).

Geology: Caswell Creek Group, Crana beds, Cania formation - Arenite, conglomerate, mudstone, siltstone, oolitic and crinoidal limestone, lava and tuff.

Landform: Rolling low hills.

Vegetation: Eucalypt woodland with limited clearing. Narrow-leaved ironbark, spotted gum, silver-leaved ironbark, bloodwoods, Moreton Bay ash and Queensland blue gum.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	25	Crests and upper slopes, 5-20%, some slopes as steep as 30%. Cobble and stone may be present on surface. Rock outcrop may also occur.	Very shallow to shallow, stony, uniform, medium textured soils over rock, and red and brown, sodic duplex soils and gradational soils with hardsetting surfaces; clay loam to light clay, medium A horizons, sometimes with bleached A2 horizons; (when present) medium clay B horizons, common to abundant, fine to medium gravel throughout profile; acid soil reaction trend. Leptic Tenosols and Rudosols and Red and Brown Chromosols and Sodosols.	Eucalypt woodland. Narrow-leaved ironbark and spotted gum.	VI-VII m6, pd3-6, ps3, nd3, ts6-7, (r3-4), e6
LU2	30	Mid slopes, 5-12%.	Moderately deep to deep, brown, sodic duplex soils with hardsetting surfaces; clay loam, medium to thick A horizons, usually with bleached A2 horizons; medium clay B horizons; neutral to alkaline soil reaction trend. Brown Sodosols and Chromosols.	Eucalypt woodland. Silver-leaved ironbark, bloodwoods, Moreton Bay ash, Queensland blue gum and narrow-leaved ironbark.	VI m4 or 6, pd3-4, ps3, nd3, e4 or 6
LU3	5	Lower slopes and major drainage lines, 1-4%.	Deep, alluvial soils or black and brown, non cracking clays with hardsetting surfaces; light clay, medium A horizons; light to medium clay B or D horizons; alkaline soil reaction trend. Leptic and Chernic-Leptic Tenosols and Black and Brown Dermosols.	Eucalypt woodland. Queensland blue gum, Moreton Bay ash and narrow-leaved ironbark. River she-oak and *Melaleuca* species fringe major drainage lines.	VI m3, ps3, e6, f2-3

CASWELL 3 (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU4	25	Mid slopes, 10-20%.	Moderately deep to deep, red, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons; light to light medium clay B horizons with common to abundant medium gravel at depth; neutral soil reaction trend. Red Dermosols.	Eucalypt woodland. Silver-leaved ironbark, Moreton Bay ash, narrow-leaved ironbark, Queensland blue gum and gum topped box.	VI m3, ps3, ts6, e6
LU5	10	Lower slopes and drainage lines, 5-10%.	Moderately deep to deep, brown, sodic duplex soils with hardsetting surfaces; clay loam, thin to medium A horizons, with bleached A2 horizons; medium clay B horizons, medium gravel may be present; alkaline soil reaction trend. Brown Sodosols.	Eucalypt woodland. Gum topped box or Queensland blue gum, Moreton Bay ash and narrow-leaved ironbark.	VI m4, pd3-4, ps3, sa3, e6
LU6	5	Flat drainage depressions, 0-2% slope. Normal gilgai may be present.	Deep, black, cracking clays with self mulching surfaces; light clay A horizons; medium clay B horizon; alkaline soil reaction trend. Black Vertosols.	Eucalypt open woodland. Queensland blue gum and rough barked apple.	III or VI m2, pm3, tm2, e2, (x6)

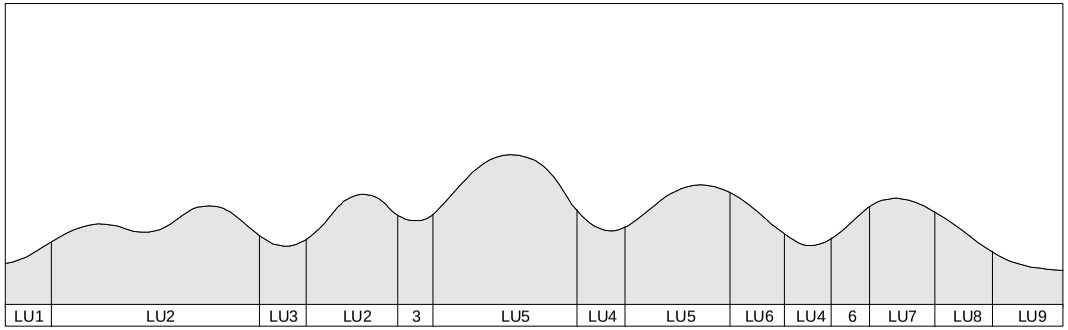
LAND SYSTEM - EVERGREEN 10 (Eg10)

General Description: Rolling low hills to rolling hills on sedimentary rocks. Major soils are very shallow to shallow, stony, coarse to medium textured soils over rock, shallow to moderately deep, red and brown, non sodic and sodic duplex soils and gradational soils, and moderately deep to deep, brown and grey, sodic duplex soils (Rudosols, Chromosols, Sodosols and Dermosols).

Geology: Evergreen Formation - Labile to sublabile sandstone, siltstone and shale.

Landform: Rolling low hills to rolling hills.

Vegetation: Eucalypt woodland and eucalypt shrubby woodland, with limited to extensive clearing. Spotted gum, narrow-leaved ironbark, gum topped box, silver-leaved ironbark with wattles, red ash and *Casuarina* species as understorey.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	10	Mid and lower slopes, 10-15%. Common to abundant, surface pebble and cobble and rock outcrop may be present.	Shallow, uniform, coarse to medium textured soils over rock and often, grey mottled, red and brown, sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, medium to thick, A horizons, often with bleached A2 horizons; (if present), light to light medium clay B horizons; usually common to abundant, medium to coarse gravel in profile; acid soil reaction trend. Bleached-Leptic Rudosols and Red and Brown Chromosols and Sodosols.	Eucalypt shrubby woodland. Spotted gum, narrow-leaved ironbark, gum topped box, budgeroo, wattles, *Casuarina* species and red ash.	VI-VII m6, pd4, ps3, nd3, r4-5, e6
LU2	40	Crests, ridges and slopes of undulating to rolling rises, 5-15% slopes. Common to abundant surface pebbles and cobbles and rock outcrop.	Very shallow to shallow, uniform, coarse and medium textured soils over rock, and often, grey mottled, red, sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, medium A horizons; (if present) light to light medium clay B horizons; usually common to abundant, medium to coarse gravel throughout profile; acid soil reaction trend. Leptic Rudosols and Red Chromosols and Sodosols.	Eucalypt shrubby woodland. Spotted gum, narrow-leaved ironbark, budgeroo and wattles.	VI-VII m6, pd4, ps3, nd3, r4-5, e6
LU3	<5	Lower concave slopes, high in the landscape, 3-6%.	Moderately deep to deep, brown, gradational and sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium to thick A horizons; light to light medium clay B horizons, usually with few to common small pebbles; acid to neutral soil reaction trend. Brown Dermosols and Chromosols.	Eucalypt shrubby woodland. Spotted gum, bloodwoods, narrow-leaved ironbark, budgeroo and wattles.	VI m6, ps3, e6

EVERGREEN 10 (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU4	<5	Lower slopes and local drainage lines, 3-6%.	Deep, brown, sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium A horizons, usually with bleached A2 horizons; light to medium clay B and D horizons, often with layers of few to common pebbles; neutral to alkaline soil reaction trend. Brown Sodosols.	Eucalypt woodland. Gum topped box, poplar box, Moreton Bay ash and wattles.	VI m6, pd4, ps3, e6
LU5	20	Crests and slopes, 20-30%. Common to abundant surface cobble and pebbles and rock outcrop.	Very shallow to shallow, medium textured soils over rock and red and brown, non sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium to thick A horizons; (if present) light to medium clay B horizons; medium to coarse gravel usually throughout profile; acid to neutral soil reaction trend. Leptic Rudosols and Red and Brown Chromosols.	Eucalypt woodland. Narrow-leaved ironbark, spotted gum and wattles.	VII m6, pd4 or 6, ps3, ts6-7, r4, e6-7
LU6	10	Midslopes, 10-15%. Some slopes as steep as 30%.	Moderately deep to deep, sometimes mottled, red, non sodic duplex and gradational soils with hardsetting surfaces; sandy clay loam to clay loam, medium A horizons; light to medium clay B horizons; often few to common, small to medium pebbles throughout profile; acid to neutral soil reaction trend. Red Chromosols and Dermosols.	Eucalypt shrubby woodland. Spotted gum, narrow-leaved ironbark, bloodwoods, red ash and wattles.	VI-VII m3-4, ps3, ts6-7, e6
LU7	10	Crests and upper slopes, 5-10%. Ironstone gravel may be present on surface.	Shallow to moderately, deep, red, non sodic duplex and gradational soils with hardsetting surfaces; sandy clay loam to clay loam, medium A horizons; light to light medium clay B horizons; often few to common, small to medium pebbles throughout profile; acid to neutral soil reaction trend. Red Chromosols and Dermosols.	Eucalypt shrubby woodland. Spotted gum, bloodwoods, narrow-leaved ironbark, gum topped box, red ash and wattles.	IV m3-4, ps3, r1-3, e2-3
LU8	<5	Midslopes, 5-15%.	Moderately deep to deep, brown and grey, sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, medium A horizons, often with bleached A2 horizons; light to medium clay B horizons; few to common small pebbles may be present in profile; neutral to alkaline soil reaction trend. Brown and Grey Sodosols and Chromosols.	Eucalypt shrubby woodland. Narrow-leaved ironbark, silver-leaved ironbark, spotted gum, gum topped box, red ash and *Casuarina* species.	VI m6, pd3-4, nd3, sa3, e6
LU9	<5	Lower slopes and major drainage lines, 2-4%.	Deep, grey, sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium A horizons, usually with bleached A2 horizons; medium clay B horizons; acid to neutral soil reaction trend. Grey Sodosols.	Eucalypt woodland. Queensland blue gum, gum topped box, Moreton Bay ash, rusty gum, poplar box and silver-leaved ironbark.	VI m6, pd3-4, ps3, sa3, e6

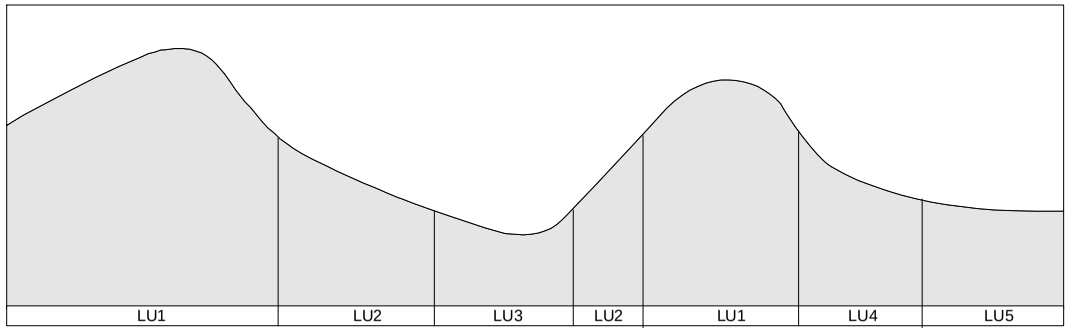
LAND SYSTEM - CANNINDAH (Cn)

General Description: Undulating hills to steep hills on limestone. Major soils are shallow to deep, brown, cracking clays, non cracking clays and gradational soils and deep, black and grey, cracking clays (Dermosols and Vertosols).

Geology: Limestone within the Caswell Creek Group.

Landform: Rolling hills to steep hills with minor undulating hills.

Vegetation: Eucalypt woodland with limited clearing on the steeper slopes and extensively to completely cleared on the lower slopes. Silver-leaved ironbark, gum topped bloodwood, narrow-leaved ironbark, Moreton Bay ash, grass trees, Queensland blue gum and gum topped box.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	40	Crests, upper and midslopes, 30-50%. Rock outcrop and surface stone abundant.	Shallow, brown, gradational soils and non cracking clays with self mulching surfaces; clay loam to light clay, medium A horizons; light clay to medium clay B horizons; alkaline soil reaction trend. Brown Dermosols.	Eucalypt open forest to woodland. Silver-leaved ironbark, gum topped bloodwood, narrow-leaved ironbark and Moreton Bay ash. "Softwood scrub" species may be present.	VII-VIII m3-4, pd2-3, ps3, ts7-8, r5, e7-8
LU2	30	Midslopes, 20-30%. Rock outcrop and surface stone common.	Moderately deep to deep, brown, cracking clays and gradational soils usually with self mulching surfaces; clay loam to light clay, medium A horizons; light clay to medium clay B horizons; alkaline soil reaction trend. Brown Vertosols and Dermosols.	Eucalypt woodland. Silver-leaved ironbark, gum topped bloodwood, Moreton Bay ash and grass trees. Grass trees sometimes dominant.	VI-VII m3, ps3, ts6-7, e6
LU3	10	Lower slopes, 5 -15%.	Deep, black and grey, cracking clays with self mulching surfaces; light clay A horizons; medium clay B horizons; alkaline soil reaction trend. Black and Grey Vertosols.	Eucalypt woodland. Gum topped box, Moreton Bay ash and Queensland blue gum.	III-IV m3, pm2, e3-4
LU4	10	Midslopes, 5-15%. Some surface rock may be present.	Moderately deep to deep, black and grey, cracking clays with self mulching surfaces; light to light medium clay A horizons; medium clay B horizons; alkaline soil reaction trend. Black and Grey Vertosols.	Eucalypt woodland. Moreton Bay ash, Queensland blue gum and silver-leaved ironbark.	III-IV m3, pm2, e3-4

CANNINDAH (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU5	10	Lower slopes, 3-6%.	Deep, black, cracking clays with self mulching surfaces; light to light medium clay A horizons; medium clay B horizons; alkaline soil reaction trend. Black Vertosols.	Eucalypt woodland. Moreton Bay ash, Queensland blue gum and gum topped box.	III m3, pm2, e2-3

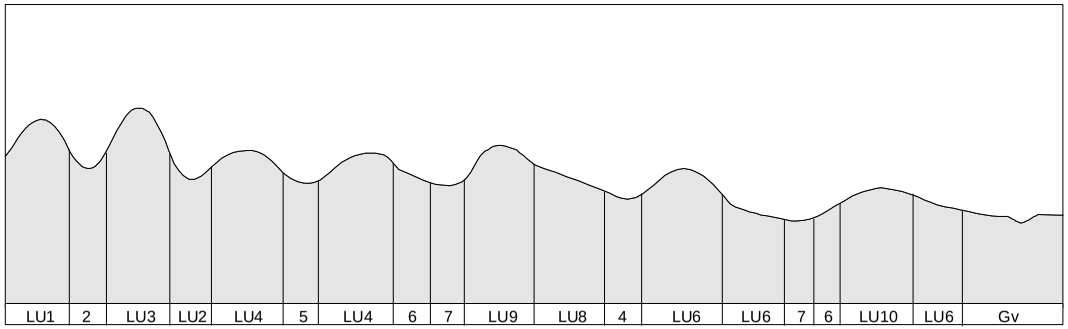
LAND SYSTEM - CASWELL 4 (Cw4)

General Description: Rolling hills on sedimentary rocks. Major soils are shallow, stony, medium textured soils over rock and red and brown, gradational soils, and moderately deep to deep, red and brown, gradational and sodic duplex soils and black, cracking and non cracking clays (Rudosols, Dermosols, Chromosols, Sodosols and Vertosols).

Geology: Caswell Creek Group, Cania Formation, Crana beds, Three Moon Conglomerate - Arenite, conglomerate, oolitic, and crinoidal limestone, mudstone, siltstone, lava and tuff.

Landform: Rolling hills with strike ridges.

Vegetation: Eucalypt open forest to woodland, limited to complete clearing. Narrow-leaved ironbark, silver-leaved ironbark, bloodwoods, Queensland blue gum, Moreton Bay ash and rusty gum.



Gv Grosvenor land system

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	10	Crests and upper slopes, 5-40%. Many surface coarse pebbles. Rock outcrop may occur.	Very shallow to shallow, medium textured soils over rock and shallow, red and brown, gradational and sodic duplex soils with hardsetting surfaces; clay loam, medium A horizons; (when present) light clay to light medium clay B horizons; pebbles and cobble common throughout profile; acid soil reaction trend. Leptic Rudosols and Red and Brown Dermosols and Chromosols	Eucalypt open forest to woodland. Narrow-leaved ironbark, bloodwoods and silver-leaved ironbark.	VI-VII m6, pd4 or 6, ps3, nd3, ts6-7, r2-4, e6
LU2	5	Lower concave slopes, 15-30%.	Shallow to moderately deep, brown, gradational and sodic duplex soils with hardsetting surfaces; clay loam, medium A horizons, with bleached A2 horizons; light to light medium clay B horizons; common to many rock fragments; neutral to alkaline soil reaction trend. Brown Dermosols and Sodosols.	Eucalypt woodland. Narrow-leaved ironbark, silver-leaved ironbark, Queensland blue gum and gum topped box.	VI-VII m6, pd2-4, ps3, nd3, ts6-7, e6
LU3	5	Crests and upper slopes, 20-50%. Limestone rock outcrop abundant.	Very shallow to shallow, brown and black, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons; light to light medium clay B horizons; neutral to alkaline soil reaction trend. Brown and Black Dermosols.	Eucalypt shrubby open forest to woodland. Narrow-leaved ironbark, silver-leaved ironbark, bloodwoods and “softwood scrub” species.	VII-VIII m6, pd3-6, ps3, t7-8, r5, e6-7

CASWELL 4 (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU4	20	Lower crests and slopes, 5-30%. Surface stone abundant. Rock outcrop may occur.	Very shallow to shallow, medium textured soils over rock and shallow, red and brown, gradational and sodic duplex soils with hardsetting surfaces; clay loam, medium A horizons; (when present) light clay to light medium clay B horizons; pebbles and cobble common throughout profile; acid soil reaction trend. Leptic Rudosols and Red and Brown Dermosols and Chromosols.	Eucalypt woodland. Narrow-leaved ironbark and silver-leaved ironbark.	VII m6, pd4 or 6, ps3, nd3, ts6-7, r5, e6
LU5	10	Valley flats, 1-5%. Non-saline and saline seeps may develop.	Moderately deep to deep, black, gradational and sodic duplex soils and non cracking and cracking clays with hardsetting surfaces (occasionally firm or self mulching); clay loam to light medium clay, medium A horizons, sometimes with bleached A2 horizons; medium clay B horizons; usually with common to many rock fragments. Black Dermosols, Sodosols and Vertosols.	Eucalypt open woodland. Queensland blue gum, rough barked apple and silver-leaved ironbark.	III-IV or V m3-4, ps3, sa1-4, (w5), e2-3, f2
LU6	15	Midslopes, 6-15%.	Moderately deep to deep, brown, gradational and sodic duplex soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons, often with bleached A2 horizons; light to light medium clay B horizons, usually with common to many rock fragments; neutral to alkaline soil reaction trend. Brown Dermosols and Sodosols.	Eucalypt woodland. Silver-leaved ironbark, gum topped bloodwood, Queensland blue gum and rusty gum.	VI m4 or 6, ps3, nd3, sa2-3, e4 or 6
LU7	5	Lower slopes and drainage depressions, 2-4% slope.	Deep, brown and grey, sodic duplex and gradational soils with hardsetting surfaces; clay loam, medium A horizons, with bleached A2 horizons; light to medium clay B horizons, often with common to many rock fragments; alkaline soil reaction trend. Brown and Grey Sodosols.	Eucalypt woodland to open woodland. Queensland blue gum, Moreton Bay ash and narrow-leaved ironbark.	VI m6, pd3-4, nd3, sa2-3, e6
LU8	5	Midslopes, 10-20%. Limestone rock outcrop may be common.	Moderately deep to deep, red and brown, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons, light to light medium clay B horizons; neutral to alkaline soil reaction trend. Red and Brown Dermosols.	Eucalypt woodland. Silver-leaved ironbark and Moreton Bay ash.	VI m3, ps3, ts6, r1-4, e6
LU9	10	Crests and upper slopes, 20-30%. Sandstone and conglomerate rock outcrop and surface stone common to abundant.	Very shallow to shallow, red and brown, non sodic duplex and gradational soils (occasionally medium texured soils over rock) with hardsetting surfaces; sandy loam to clay loam, thin to medium A horizons; clay loam to light clay B horizons; acid to neutral soil reaction trend. Red and Brown Chromosols and Dermosols.	Eucalypt open forest to woodland. Narrow-leaved ironbark, gum topped bloodwood and Moreton Bay ash.	VI-VII m6, pd4 or 6, nd3, ts6-7, r4-5, e6
LU10	15	Broad ridges and upper slopes, 10-20%. Coarse fragments and rock outcrop may be common on surface.	Shallow to moderately deep, red and brown, sodic duplex soils with hardsetting surfaces; clay loam, medium A horizons; medium clay B horizons, often rock fragments throughout; acid to neutral soil reaction trend. Red and Brown Chromosols.	Eucalypt open forest to woodland. Silver-leaved ironbark and narrow-leaved ironbark.	VI m4 or 6, pd3, ps3, nd3, ts6, r2-4, e6

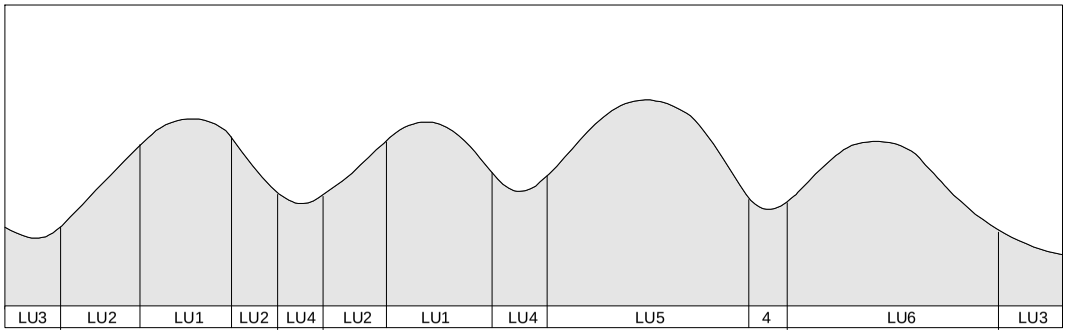
LAND SYSTEM - MONAL 2 (Mn2)

General Description: Rolling hills to steep hills on sedimentary rocks. Major soils are shallow to deep, red and brown, gradational soils, and non cracking clays and non sodic and sodic duplex soils (Dermosols and Chromosols).

Geology: Dawes Range Formation - Lithic arenite, siltstone, conglomerate, andestic lava, tuff and agglomerate.

Landform: Rolling hills to steep hills with minor rolling low hills.

Vegetation: Eucalypt woodland to open forest with no effective disturbance to limited clearing. Narrow-leaved ironbark, spotted gum, grey gum, bloodwoods, silver-leaved ironbark, Queensland blue gum and Moreton Bay ash.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	20	Crests and upper slopes, 10-20%. Rock outcrop common. Often abundant surface stone.	Very shallow to shallow, red, non sodic duplex soils and gradational soils with hardsetting surfaces; loam to clay loam, medium A horizons; light clay B horizons; gravel often throughout profile; acid to neutral soil reaction trend. Red Chromosols and Dermosols.	Eucalypt woodland to open forest. Narrow-leaved ironbark, spotted gum, bloodwoods, often with *Casuarina* species as understorey.	VI m4 or 6, pd3-4, ps3, nd3, r4-5 ts6, e6
LU2	20	Midslopes, 20-40%. Rock outcrop and surface stone may be common in places.	Shallow, red, non sodic duplex soils and gradational soils with hardsetting surfaces; loam to clay loam, medium A horizons; light clay B horizons; gravel often throughout profile; acid to neutral soil reaction trend. Red Chromosols and Dermosols.	Eucalypt woodland. Narrow-leaved ironbark, spotted gum and grey gum.	VII m4, pd2-3, ps3, nd3 (r4), ts7, e7
LU3	10	Lower slopes and drainage lines, 6-12%.	Deep, black and brown, gradational and sodic duplex soils with hardsetting surfaces; clay loam, medium A horizons, occasionally with bleached A2 horizons; light to medium clay B horizons, usually with few to common, fine to medium gravel; alkaline soil reaction trend. Black and Brown Dermosols and Chromosols.	Eucalypt open woodland. Silver-leaved ironbark, Queensland blue gum, Moreton Bay ash, narrow-leaved ironbark. *Melaleuca* species and River she-oaks fringe the main drainage lines.	VI m3-4, pd2-3, ps3, nd3, e6
LU4	10	Lower concave slopes, 5-10%.	Moderately deep to deep, red and brown, non sodic and sodic duplex soils with hardsetting surfaces; loam to clay loam, thick A horizons; light clay to light medium clay B horizons usually common to abundant gravel throughout profile; neutral soil reaction trend. Red Chromosols.	Eucalypt woodland. Narrow-leaved ironbark and Moreton Bay ash.	VI m3-4, pd2-3, ps3, nd3, e6

MONAL 2 (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU5	30	Crests, upper and midslopes, 20-30%, some slopes up to 50%. Rock outcrop and surface stone may be present in places.	Shallow to deep, red, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons; light to medium clay B horizons; usually few to common, coarse gravel to cobble throughout profile; acid to neutral soil reaction trend. Red Dermosols.	Eucalypt woodland to open forest. Narrow-leaved ironbark, grey gum, spotted gum and bloodwoods.	VII-VIII m6, pd2-3, ps3, nd3, r3-4, ts7-8, e7.
LU6	10	Broad ridges and midslopes, 10-15%.	Moderately deep to deep, red and brown, non cracking clays and gradational soils with hardsetting surfaces; clay loam to light clay, medium A horizons; medium clay B horizons often with gravel; neutral to alkaline soil reaction trend. Red and Brown Dermosols.	Eucalypt woodland. Silver-leaved ironbark and Moreton Bay ash.	VI m3, ps3, nd3, e6

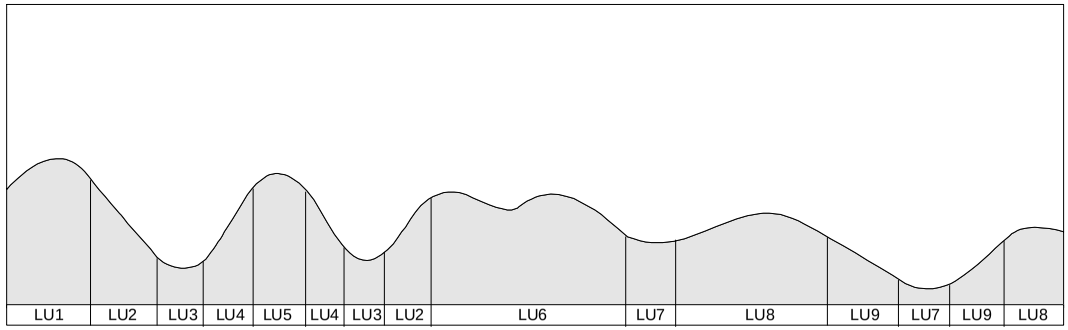
LAND SYSTEM - BANIA 2 (Ba2)

General Description : Rolling hills to steep hills on sedimentary rocks. Major soils are stony, very shallow to shallow, medium textured soils over rock and brown and yellow, gradational soils, and moderately deep, red, brown and yellow, gradational soils and sodic duplex soils (Tenosols, Dermosols, Chromosols and Sodosols).

Geology: Wandilla Formation - Mudstone, arenite, siltstone, jasper, chert, slate, schist.

Landform: Steep hills with minor rolling hills with some plateau surfaces.

Vegetation: Eucalypt woodland and shrubby woodland with no effective disturbance to limited clearing. Spotted gum, narrow-leaved ironbark, bloodwoods, rusty gum, swamp mahogany, gum topped box, *Casuarina* species, wattles and zamia.



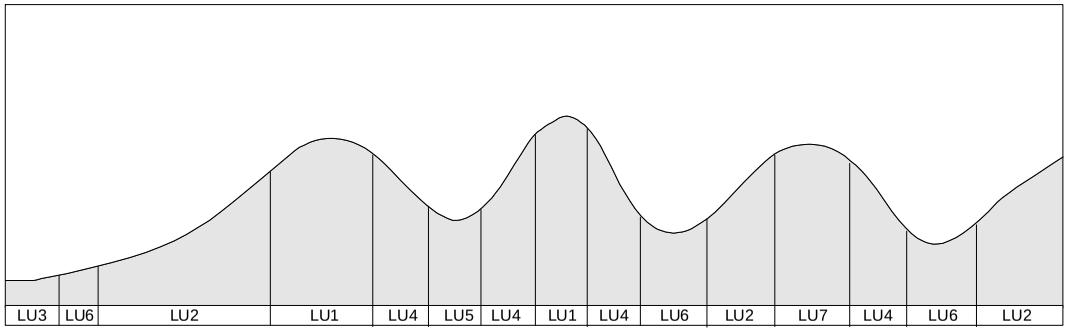
Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	20	Crest and upper slopes, 5-15%. Pebble or cobbles common on surface. Rock outcrop.	Very shallow to shallow, stony, medium textured soils over rock, and brown and yellow, gradational soils with hardsetting surfaces; clay loam, medium A horizons, often with bleached A2 horizons; (if present) light clay B horizons; usually many to abundant medium gravel throughout profile; acid to neutral soil reaction trend. Leptic Rudosols and Bleached-Leptic Tenosols and Brown and Yellow Dermosols.	Eucalypt shrubby woodland. Narrow-leaved ironbark, spotted gum, swamp mahogany, *Casuarina* species, wattles and zamia.	VII m6, pd4 or 6, ps3, nd3, r5, e6
LU2	20	Midslopes, 30-40%. Pebble and cobble common on surface. Rock outcrop.	Shallow, yellow and brown, gradational soils with hardsetting surfaces; clay loam, medium A horizons, occasionally with bleached A2 horizons; light clay B horizons; many to abundant, medium gravel or pebbles usually throughout profile; acid to neutral soil reaction trend. Yellow and Brown Dermosols.	Eucalypt open forest to woodland. Spotted gum, narrow-leaved ironbark and zamia.	VII m6, pd3-4, ps3, nd3, ts7, r4-5, e7
LU3	5	Lower concave slopes, 10-15%. Pebble and cobble present. Rock outcrop.	Shallow to moderately deep, brown, sodic duplex and gradational soils with hardsetting surfaces; clay loam, medium A horizons, often with bleached A2 horizons; light clay to medium clay B horizons; many to abundant pebbles and cobble throughout profile; acid to neutral soil reaction trend. Brown Sodosols and Dermosols.	Eucalypt woodland. Gum topped box and apple tree. She-oaks and *Melaleuca* species in drainage lines.	VI-VII m6, pd3-4, nd3, ts4, r3-5, e6

BANIA 2 (continued)

LandUnit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU4	5	Midslopes, 20-30%. Medium gravel common on surface.	Moderately deep, red, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons; light clay B horizons; many to abundant, medium gravel usually throughout profile; acid to neutral soil reaction trend. Red Dermosols.	Eucalypt woodland. Narrow-leaved ironbark, bloodwoods, *Casuarina* species and zamia.	VI-VII m3-4, ps3, nd3, ts6-7, r2-4, e6-7
LU5	5	Crests and upper slopes, 15-20%. Medium gravel common to abundant on surface.	Shallow, red, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons; light clay to light medium clay B horizons; few to abundant, medium gravel throughout profile; acid to neutral soil reaction trend. Red Dermosols.	Eucalypt woodland. Narrow-leaved ironbark and bloodwoods.	VI m4 or 6, pd2-3, ps3, nd3, ts6, r2-4, e6
LU6	25	Undulating rises on a plateau, slopes 6-12%. Medium gravel common to abundant on surface. Rock outcrop common in places.	Very shallow to shallow, stony, medium textured soils over rock, and brown, gradational soils with hardsetting surfaces; loam to clay loam, medium to thick A horizons, usually with bleached A2 horizons; (if present) light clay B horizons; few to abundant medium gravel throughout profile; acid to neutral soil reaction trend. Bleached-Leptic Tenosols and Brown Kandosols and Dermosols.	Eucalypt open forest. Spotted gum, narrow-leaved ironbark, swamp mahogany, red ash, *Casuarina* species, wattles and grass tree, with gum topped box often dominant on lower slopes.	VII m6, pd4 or 6, ps3, nd3, ts4, r5, e6
LU7	5	Lower concave slopes, 5-10%.	Shallow to moderately deep, brown, gradational soils and sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam to light clay, medium to thick A horizons; light clay to medium clay B horizons; acid soil reaction trend. Brown Dermosols and Chromosols.	Eucalypt woodland. Spotted gum, Moreton Bay ash, narrow-leaved ironbark, gum topped box and wattles.	IV or VI m3-4, ps3, nd3, e4 or 6
LU8	10	Crests, ridges and upper slopes, 6-12%.	Moderately deep, red, gradational soils with hardsetting surfaces; clay loam, medium A horizons, often with bleached A2 horizons; light clay B horizons; few to common, medium gravel throughout or in lower part of profile; acid soil reaction trend. Red Dermosols.	Eucalypt shrubby woodland. Bloodwoods, spotted gum, rusty gum, swamp mahogany, *Casuarina* species and wattles.	VI m6, ps3, nd3, e3-4
LU9	5	Midslopes, 6-12%.	Moderately deep, brown and yellow, gradational and sodic duplex soils with hardsetting surfaces; loam to clay loam, medium A horizons; light to light medium clay B horizons; usually, few to abundant medium gravel throughout profile or in A horizons; acid to neutral soil reaction trend. Yellow and Brown Dermosols and Chromosols.	Eucalypt shrubby woodland. Spotted gum, bloodwoods, wattles and *Casuarina* species.	VI m6, pd2-3, ps3, nd3, e6

LAND SYSTEM - HUTTON 3 (Ht3)

General Description: Rolling hills to steep hills on sedimentary rocks. Major soils are shallow to moderately deep, brown and grey, sodic duplex soils (Sodosols).
Geology: Hutton Sandstone - Quartz sandstone, siltstone, shale and coal.
Landform: Rolling hills to steep hills.
Vegetation: Eucalypt woodland with limited clearing. Spotted gum, narrow-leaved ironbark, bloodwoods, gum topped box, Moreton Bay ash and Queensland blue gum, occasionally with wattles and *Casuarina* species.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	25	Crests and upper slopes, 5-10%. Rock outcrop and surface stone usually present.	Very shallow to shallow, brown and red, sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, gravelly, medium A horizons, with bleached A2 horizons; sandy, light to medium clay B horizons, usually gravelly, acid to neutral soil reaction trend. Brown and Red Sodosols and Chromosols.	Eucalypt woodland. Narrow-leaved ironbark, spotted gum, and bloodwoods, occasionally with wattles and *Casuarina* species.	VI m6, pd6, nd3, r4, e6
LU2	25	Midslopes, 10-20%. Rock outcrop and surface stone usually present.	Shallow to moderately deep, mottled, grey and brown, sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, medium to thick A horizons, with bleached A2 horizons; light to light medium clay B horizons; gravel may be present throughout profile; acid to neutral soil reaction trend. Grey and Brown Chromosols and Sodosols.	Eucalypt woodland. Spotted gum, bloodwoods and narrow-leaved ironbark, occasionally with wattles.	VI m6, pd3-4, nd3, r2-4, ts6, e6
LU3	<5	Lower slopes and major drainage lines, 1-3%.	Deep, mottled, grey, sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium to thick A horizons, with bleached A2 horizons; medium clay B horizons; alkaline soil reaction trend. Grey Sodosols.	Eucalypt woodland. Gum topped box, Queensland blue gum and Moreton Bay ash, occasionally with *Casuarina* species.	VI m6, pd3-4, ps3, nd3, sa3, e6
LU4	35	Mid and upper slopes, 25-40%. Rock outcrop common.	Shallow, brown, sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, gravelly, medium A horizons, with bleached A2 horizons; sandy, light to medium clay B horizons, usually gravelly; acid to neutral soil reaction trend. Brown Sodosols and Chromosols.	Eucalypt woodland. Narrow-leaved ironbark, spotted gum, bloodwoods, occasionally wattles and *Casuarina* species present.	VII m6, pd4, nd3, ts7, e7

HUTTON 3 (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU5	5	Lower slopes, 10-15%.	Shallow, usually mottled, brown and grey, sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, gravelly, medium A horizons, with bleached A2 horizons; sandy, light to medium clay B horizons, usually gravelly; acid to neutral soil reaction trend. Brown Sodosols and Chromosols.	Eucalypt woodland. Narrow-leaved ironbark, spotted gum and bloodwoods.	VI m6, pd4, nd3, e6
LU6	<5	Lower slopes and drainage lines, 3-8%.	Moderately deep to deep, sometimes mottled, brown and grey, sodic duplex and gradational soils with hardsetting surfaces; sandy clay loam to clay loam, medium to thick A horizons, with bleached A2 horizons; medium clay B horizons; neutral to alkaline soil reaction trend. Brown and Grey Sodosols and Dermosols.	Eucalypt woodland. Gum topped box.	VI m6, pd3-4, nd3, e6
LU7	5	Crests and upper slopes, 5-10%.	Shallow to moderately deep, uniform, coarse textured soils over rock or brown, sodic duplex soils with hardsetting surfaces; sandy loam, thick to very thick A horizons, usually with bleached A2 horizons; (if present) sandy, light clay B horizons; acid soil reaction trend. Bleached-Leptic Tenosols and Brown Sodosols.	Eucalypt woodland. Narrow-leaved ironbark, Moreton Bay ash and bloodwoods.	VI m6, pd3, nd3, e6

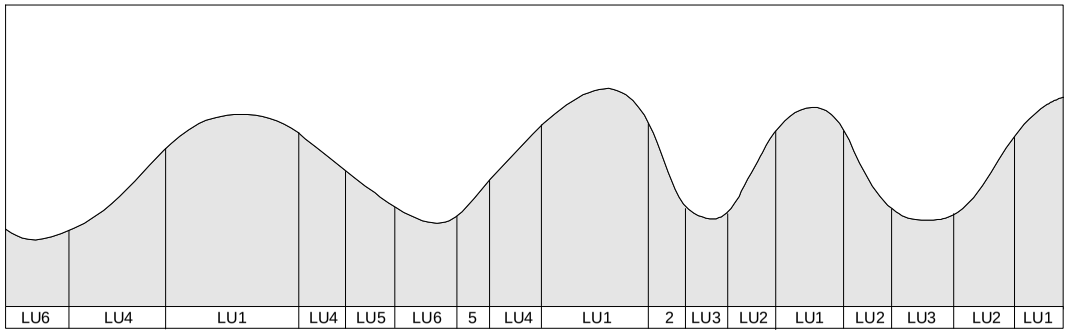
LAND SYSTEM - CASWELL 5 (Cw5)

General Description: Rolling hills to steep hills on sedimentary rocks. Major soils are very shallow to shallow, stony, medium textured soils over rock and shallow to moderately deep, red and brown, gradational soils and non cracking clays and brown and yellow, sodic duplex soils (Tenosols, Dermosols, Sodosols and Chromosols).

Geology: Caswell Creek Group, Boiling Creek Group, Burnett Formation - Lithic arenite, siltstone, mudstone, shale, conglomerate, limestone.

Landform: Rolling hills to steep hills.

Vegetation: Eucalypt woodland with limited clearing. Narrow-leaved ironbark, spotted gum, silver-leaved ironbark, Moreton Bay ash, gum topped box and Queensland blue gum.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	30	Crests and narrow ridges, 5-8% slope and upper slopes, 10-30%. Common to abundant pebbles and cobble on surface. Rock outcrop may occur.	Very shallow to shallow, uniform, medium textured soils over rock, and red and brown, sodic duplex and gradational soils with hardsetting surfaces; clay loam, medium A horizons, usually with stony bleached A2 horizons; light to medium clay B horizons, usually with common to abundant medium gravel; acid soil reaction trend. Bleached Leptic Tenosols, Red and Brown Sodosols and Dermosols.	Eucalypt woodland. Narrow-leaved ironbark, spotted gum, gum topped box and rosewood.	VI-VII m6, pd4 or 6, ps3, nd3, ts6-7, r3-5, e6-7
LU2	25	Mid slopes, 20-40%. Few to common coarse gravel or cobble may be present on surface. Rock outcrop may occur.	Very shallow to shallow, medium textured soils over rock or red and brown, gradational and sodic duplex soils with hardsetting surfaces; clay, loam, medium A horizons; (if present) light to light medium clay B horizons, with common to abundant, fine to medium gravel; acid to neutral soil reaction trend. Leptic Rudosols and Red and Brown Dermosols and Sodosols.	Eucalypt open woodland to woodland. Narrow-leaved ironbark, Moreton Bay ash and spotted gum.	VI-VII m6, pd4 or 6, ps3, nd3, ts6-7, r2-5, e6-7
LU3	5	Lower slopes and drainage lines, 6-12%.	Shallow to moderately deep, brown, sodic duplex soils, gradational soils and alluvial soils with hardsetting surfaces; clay loam, medium to thick A horizons, with stony, bleached A2 horizons; light to light medium clay B or D horizons, with common to abundant, fine to medium gravel; acid to neutral soil reaction trend. Bleached-Leptic Tenosols, Brown Sodosols and Dermosols.	Eucalypt woodland. Gum-topped box, Moreton Bay ash. River she-oaks and *Melaleuca* species fringe drainage lines.	VI m6, pd1-3, ps3, e6

CASWELL 5 (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU4	20	Midslopes, 15-20%.	Shallow to moderately deep, red and brown, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons; light to light medium clay B horizons, with common to abundant, medium gravel at depth; neutral soil reaction trend. Red and Brown Dermosols.	Eucalypt woodland. Silver-leaved ironbark, Moreton Bay ash, narrow-leaved ironbark, Queensland blue gum and gum topped box.	VI m3-4, ps3, ts6, e6
LU5	15	Mid and lower slopes, 15-20%.	Shallow to moderately deep, brown and yellow, sodic duplex soils with hardsetting surfaces; clay loam, medium A horizons, usually with bleached A2 horizons; medium clay B horizons; neutral to alkaline soil reaction trend. Brown and Yellow Sodosols and Chromosols.	Eucalypt woodland. Silver-leaved ironbark, narrow-leaved ironbark, Moreton Bay ash and gum topped box.	VI m6, pd3-4, ps3, nd3, ts6, e6
LU6	5	Lower slopes and drainage lines, 0-2%.	Deep, red, non cracking clays and sodic duplex and gradational soils with hardsetting surfaces; clay loam to light clay, medium A horizons, occasionally with bleached A2 horizons; light to light medium clay B horizons; acid to neutral soil reaction trend. Red Dermosols and Chromosols.	Eucalypt woodland. Moreton Bay ash, gum topped box, narrow-leaved ironbark and brown bloodwood. River she-oak and *Melaleuca* species fringe drainage lines.	VI m3, pd1-3, ps3, e6

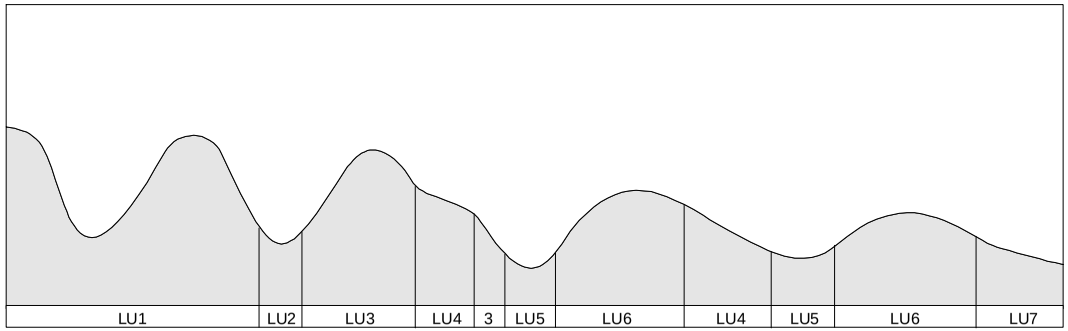
LAND SYSTEM - PRECIPICE (Pp)

General Description: Rolling low hills to steep hills, with cliffs and scarps. Major soils are shallow to shallow, uniform, coarse and medium textured soils over rock and shallow to moderately deep, red and brown, gradational soils and non sodic duplex soils (Rudosols, Dermosols and Chromosols).

Geology: Precipice Sandstone - Quartz sandstone, siltstone, shale and coal.

Landform: Rolling low hills to steep hills with cliffs and scarps.

Vegetation: Eucalypt woodland with no effective disturbance to limited clearing. Narrow-leaved ironbark, grey gum, spotted gum, bloodwoods, wattles and *Casuarina* species.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	20	Cliffs, scarps and steep hills, 40-60% slope with exposed cliff faces and sandstone outcrop abundant.	Very shallow to shallow, brown, uniform, coarse textured soils with hardsetting surfaces; loamy sand to sandy loam, medium A horizons over sandstone or sandy to sandy loam B horizons; acid soil reaction trend. Arenic Rudosols and Orthic Tenosols.	Eucalypt woodland. Narrow-leaved ironbark, grey gum, *Casuarina* species and wattles.	VIII m6, pd4 or 6, nd3, ts8, r5, e8
LU2	5	Lower concave slopes at base of steep slopes, 15-30%.	Shallow to moderately deep, brown, gradational soils with hardsetting surfaces; sandy clay loam to clay loam, medium A horizons; light clay B or D horizons, usually with rock fragments; acid soil reaction trend. Brown Dermosols and Leptic Tenosols.	Eucalypt woodland. Spotted gum, narrow-leaved ironbark, wattles and *Casuarina* species.	VIII m3-4, pd2-3, ts6-7, e6
LU3	30	Crests, ridges and midslopes, 15-20%. Rock outcrop and surface ironstone common.	Very shallow to shallow, stony, uniform, medium textured soils and red and brown, gradational soils with hardsetting surfaces; sandy clay loam to clay loam, medium A horizons over sandstone C horizons or light clay B horizons; acid soil reaction trend. Leptic Rudosols and Red and Brown Dermosols.	Eucalypt woodland. Spotted gum, narrow-leaved ironbark, grey gum, *Casuarina* species and wattles.	VI-VII m6, pd4 or 6, ps3, nd3, ts6-7, r4-5, e6
LU4	20	Midslopes, 6-15%.	Moderately deep, red, gradational soils with hardsetting surfaces; clay loam, medium A horizons, sometimes with bleached A2 horizons; light to light medium clay B horizons, often with common to abundant quartz grains throughout; acid soil reaction trend. Red Dermosols.	Eucalypt woodland. Spotted gum, narrow-leaved ironbark, bloodwoods, rusty gum, *Casuarina* species and wattles.	VI m4, nd3, ps3, e4 or 6

PRECIPICE (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU5	10	Lower slopes, 5-10%.	Shallow to moderately deep, red, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons; light clay B horizons; ferricrete may be present at depth; acid soil reaction trend. Red Dermosols.	Eucalypt woodland. Spotted gum, narrow-leaved ironbark, bloodwoods and wattles.	VI m4, pd2-3, ps3, nd3, e3-4
LU6	10	Crests and ridges, 5-10%.	Shallow to moderately deep, occasionally grey, mottled, red, non sodic duplex and gradational soils with firm to hardsetting surfaces; loam to clay loam, medium A horizons, sometimes with bleached A2 horizons; light clay to light medium clay B horizons; acid soil reaction trend. Red Chromosols and Dermosols.	Eucalypt woodland. Spotted gum, grey gum, narrow-leaved ironbark and wattles.	VI m4 or 6, pd2-3, ps3, nd3, e4
LU7	5	Ridges, 8-15%.	Shallow to moderately deep, usually red, mottled, grey non sodic duplex soils with hardsetting surfaces; loam to clay loam, medium A horizons, usually with bleached A2 horizons; medium clay B horizons; common to abundant ferricrete cobble usually present on top of B horizon; acid soil reaction trend. Grey Chromosols.	Woodland. *Casuarina* species and wattles with grey gum as emergent.	VI m6, pd3-4, ps3, nd3, e6

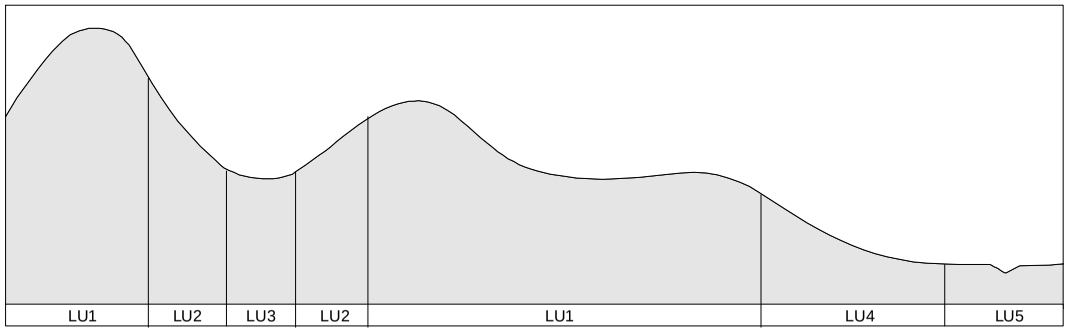
LAND SYSTEM - GOODNIGHT 1 (Gn1)

General Description: Rolling low hills on metasediments. Major soils are shallow to moderately deep, brown and red, gradational soils and non cracking clays (Dermosols).

Geology: Goodnight Beds - Slate, phyllite, argillite, chert, jasper, arenite, limestone, basic metavolcanics, diamictite.

Landform: Rolling low hills.

Vegetation: "Softwood scrub" forest with minor eucalypt shrubby forest with limited clearing. "Softwood scrub" species, hoop pine with minor Queensland blue gum, Moreton Bay ash and narrow-leaved ironbark.



Land Unit	Area%	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	45	Crests and upper slopes, 10-30%. Stone and cobble may be present on surface.	Shallow, brown and red, gradational soils with hardsetting surfaces; clay loam, thin to medium A horizons; clay loam to light clay B horizons; often with rock fragments throughout profile; acid to neutral soil reaction trend. Brown and Red Dermosols.	Forest. "Softwood scrub" species and hoop pine.	VI-VII m6, pd3-4, ps3, ts6-7, r2-3, e6-7
LU2	30	Midslopes, 15-30%. Stone usually present on surface.	Shallow to moderately deep, red and brown, gradational soils and non cracking clays; clay loam to light clay, medium A horizons; light to light medium clay B horizons; rock fragments often throughout profile; acid to neutral soil reaction trend. Red and Brown Dermosols.	Forest. "Softwood scrub" species.	VI-VII m4 or 6, pd2-3, ps3, ts6-7, r3-4, e6-7
LU3	10	Lower concave slopes, 5-10%. Stone usually present on surface.	Shallow to moderately deep, brown and yellow, gradational soils and non cracking clays; clay loam to light clay, medium A horizons; light to light medium clay B horizons; rock fragments and stone often throughout profile; neutral soil reaction trend. Brown and Yellow Dermosols.	Forest. "Softwood scrub" species.	VI m4 or 6, pd2-4, ps3, ts4, r3-4, e6
LU4	10	Midslopes, 8-12%.	Shallow to moderately deep, brown, gradational soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons; light clay B horizons; neutral soil reaction trend. Brown Dermosols.	Forest. "Softwood scrub" species and hoop pine.	IV or VI m4 or 6, pd2-3, ps3, e4 or 6

GOODNIGHT 1 (continued)

Land Unit	Area%	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU5	5	Lower slopes and drainage lines, 2-5%.	Deep, grey, sodic duplex and gradational soils with hardsetting surfaces; clay loam, thin to medium A horizons, with bleached A2 horizons; light to medium clay B horizons; alkaline soil reaction trend. Grey Sodosols and Dermosols.	Eucalypt shrubby open forest to woodland. Queensland blue gum, Moreton Bay ash, narrow-leaved ironbark and “softwood scrub” species.	VI m6, pd4, ps3, e4

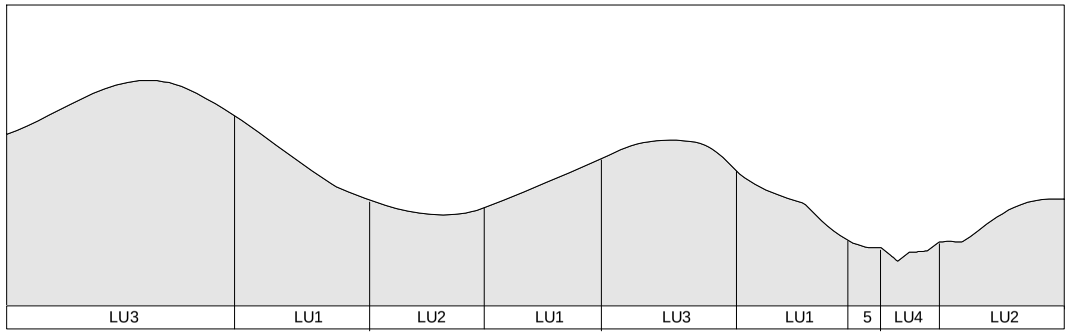
LAND SYSTEM - GOODNIGHT 2 (Gn2)

General Description: Undulating low hills to rolling low hills on metasediments. Major soils are shallow, stony, medium textured soils over rock, and shallow to moderately deep, red, brown and grey, sodic duplex soils and non cracking clays (Tenosols, Sodosols and Dermosols).

Geology: Goodnights Beds - Slate, phyllite, argilite, chert, jasper, arenite, limestone basic metavolcanics, diamictite.

Landform: Undulating low hills to rolling low hills.

Vegetation: Eucalypt open forest to woodland, limited to extensive clearing. Narrow-leaved ironbark, Moreton Bay ash, spotted gum, bloodwoods and silver-leaved ironbark.



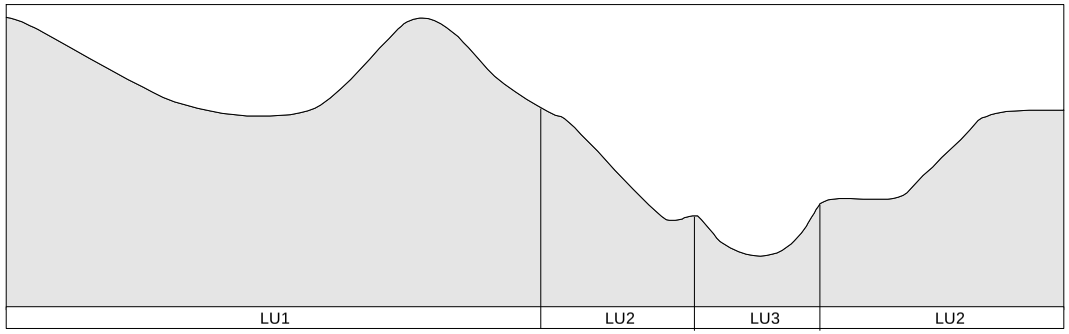
Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	45	Midslopes, 5-15%.	Moderately deep, sometimes mottled, brown and grey, sodic duplex soils and non cracking clays with hardsetting surfaces; loam to light clay, medium A horizons, often with bleached A2 horizons; medium clay B horizons; few to many, medium gravel or pebbles often throughout profile; alkaline soil reaction trend. Brown and Grey Sodosols and Dermosols.	Eucalypt woodland. Narrow-leaved ironbark, Moreton Bay ash, bloodwoods and silver-leaved ironbark.	VI m4 or 6, pd2-3, ps3, nd3, e6
LU2	20	Lower slopes, 5-15%. Stone often on surface.	Moderately deep, brown, sodic duplex soils with hardsetting surfaces; clay loam, medium A horizons, often with bleached A2 horizons; medium clay B horizons; gravel often throughout the profile; acid to neutral soil reaction trend. Brown Sodosols.	Eucalypt open forest. Moreton Bay ash and narrow-leaved ironbark.	VI m4 or 6, pd3-4, ps3, nd3, r2-3, e6
LU3	20	Crests and upper slopes, 5-12%. Medium gravel usually present on surface.	Very shallow to shallow, medium textured soils over rock and shallow, red and brown, sodic duplex soils with hardsetting surfaces; clay loam, medium A horizons, usually with bleached A2 horizons; (when present) light medium clay B horizons; common, medium to coarse gravel and pebbles throughout; acid to neutral soil reaction trend. Bleached-Leptic and Leptic Tenosols and Red and Brown Sodosols.	Eucalypt woodland. Narrow-leaved ironbark, spotted gum and Moreton Bay ash.	VI m6, pd4 or 6, ps3, nd3, r2-3, e6

GOODNIGHT 2 (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU4	5	Lower slopes and drainage lines, 3-5%.	Moderately deep, often mottled, grey and brown, sodic duplex and gradational soils with hardsetting surfaces; clay loam, medium A horizons, usually with bleached A2 horizons; light to medium clay B horizons; alkaline soil reaction trend. Grey and Brown Sodosols and Dermosols.	Eucalypt woodland. Moreton Bay ash, narrow-leaved ironbark and Queensland blue gum.	VI m6, pd4, ps3, nd3, e6
LU5	10	Mid to lower slopes, 5-10%.	Shallow to moderately deep, often mottled, brown, sodic duplex soils with hardsetting surfaces; loam to clay loam, often gravelly, medium to thick A horizons, with bleached A2 horizons; medium clay B horizons; alkaline soil reaction trend. Brown Sodosols.	Eucalypt open forest to woodland. Narrow-leaved ironbark and Moreton Bay ash.	VI m4 or 6, pd3-4, ps3, nd3, e6

LAND SYSTEM - GOODNIGHT 3 (Gn3)

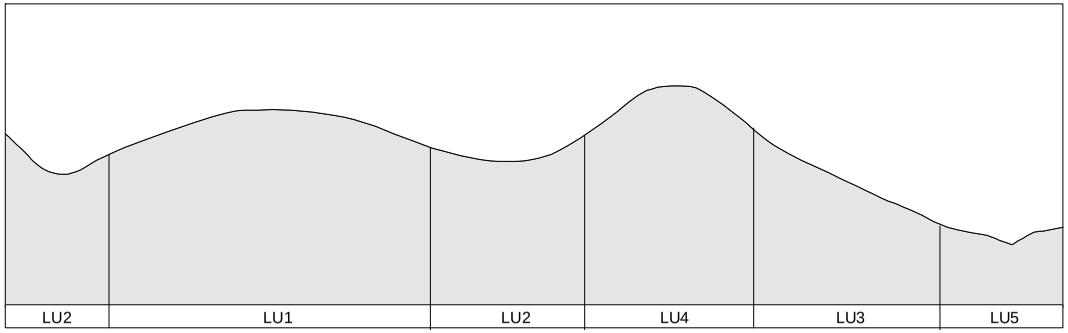
General Description: Undulating low hills to rolling low hills on metasediments. Major soils are shallow, stony, uniform, medium textured soils over rock and shallow to moderately deep, grey and brown, sodic duplex soils and gradational soils (Tenosols, Sodosols, Chromosols, Kandosols and Dermosols).
Geology: Goodnights Beds - Slate, phyllite, argilite, chert, jasper, arenite, limestone, basic metavolcanics, diamictite.
Landform: Undulating low hills to rolling low hills.
Vegetation: Eucalypt open forest with limited clearing. Major species are spotted gum, narrow-leaved ironbark, rosewood, bloodwoods and Queensland blue gum.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	60	Undulating upper slopes, 3-15%. Rock outcrop may be present.	Shallow, uniform, medium textured soils over rock and shallow, grey, sodic duplex soils with hardsetting surfaces; clay loam, thin to medium A horizons, usually with bleached A2 horizons; (when present) light medium clay B horizons; usually few to common gravel or pebbles throughout profile; acid soil reaction trend. Grey Sodosols and Leptic and Bleached-Leptic Tenosols.	Eucalypt open forest. Spotted gum, narrow-leaved ironbark, rosewood and bloodwoods.	VI m6, pd4, ps3, nd3, r1-4, e6
LU2	25	Upper to mid slopes, 5-15%. Rock outcrop common.	Moderately deep, grey, gradational and sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium A horizons, occasionally with bleached A2 horizons; light clay to light medium clay B horizons, usually with common to many coarse fragments; acid soil reaction trend. Grey Kandosols, Dermosols and Chromosols.	Eucalypt open forest. Narrow-leaved ironbark, spotted gum and bloodwoods.	VI-VII m4 or 6, pd2-3, ps3, nd3, r3-5, e4 or 6
LU3	15	Lower slopes and drainage lines, 3-10%. Stone may be present on surface.	Moderately deep, usually mottled, grey and brown, sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium to thick A horizons, with bleached A2 horizons; medium clay B horizons with few to many, medium gravel or pebbles (sometimes in A horizons); acid to alkaline soil reaction trend. Brown Sodosols and Chromosols.	Eucalypt open forest. Queensland blue gum, narrow-leaved ironbark and spotted gum.	VI m6, pd2-3, ps3, nd3, r1-4, e6

LAND SYSTEM - CURTIS 1 (Ct1)

General Description: Undulating low hills to rolling low hills on metasediments. Major soils are very shallow to shallow, uniform, medium textured soils over rock and shallow to moderately deep, brown and yellow, sodic duplex soils (Rudosols and Sodosols).
Geology: Undivided formation of the Carboniferous Curtis Island Group - Micaschist, gneiss, amphibolite, quarzite.
Landform: Undulating low hills to rolling low hills.
Vegetation: Eucalypt woodland, extensively cleared. Spotted gum, narrow-leaved ironbark, bloodwoods, Queensland blue gum, Moreton Bay ash and wattles.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	40	Crests and broad ridges, 3-8%.	Shallow to moderately deep, brown, sodic duplex soils with hardsetting surfaces; fine sandy loam to sandy clay loam, medium A horizons, with bleached A2 horizons; light clay to light medium clay B horizons; alkaline soil reaction trend. Brown Sodosols.	Eucalypt woodland. Spotted gum, bloodwoods, narrow-leaved ironbark, Queensland blue gum, Moreton Bay ash and wattles.	VI m6, pd3, nd3, e3-6
LU2	10	Lower concave slopes and drainage lines, 5-12%.	Moderately deep, brown, sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam, medium to thick A horizons, with bleached A2 horizons; light clay B horizons, usually with common fine small pebbles; alkaline soil reaction trend. Brown Sodosols.	Eucalypt woodland. Spotted gum and Queensland blue gum.	VI m4 or 6, pd2-3, nd3, e6
LU3	25	Midslopes, 8-12%.	Shallow to moderately deep, brown and yellow, sodic duplex soils with hardsetting surfaces; sandy loam to sandy clay loam; medium A horizons, with bleached A2 horizons; light clay to light medium clay B horizons; may have medium gravel throughout or in A horizons; alkaline soil reaction trend. Brown and Yellow Sodosols.	Eucalypt woodland. Spotted gum, narrow-leaved ironbark, Queensland blue gum and wattles.	VI m6, pd3-4, nd3, e6
LU4	20	Crests and ridges, 3-10%. Common to abundant surface cobble.	Very shallow to shallow, stony, medium textured soils over rock and brown, sodic duplex and gradational soils with hardsetting surfaces; sandy clay loam to clay loam, medium A horizons; (when present) light clay B horizons; common to abundant medium gravel usually throughout; acid soil reaction trend. Leptic Rudosols and Brown Sodosols and Dermosols.	Eucalypt woodland. Spotted gum, narrow-leaved ironbark and wattles.	VI-VII m6, pd3-6, nd3, r4-5, e6

CURTIS 1 (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU5	5	Lower slopes and major drainage lines, 1-5%.	Moderately deep to deep, brown, sodic duplex soils and alluvial soils with hardsetting surfaces; sandy loam to sandy clay loam, medium to thick A horizons, often with bleached A2 horizons; sandy loam to light clay B or D horizons; neutral to alkaline soil reaction trend. Brown Sodosols and Stratic Rudosols.	Eucalypt woodland. Queensland blue gum, Moreton Bay ash. *Casuarina* and *Meleleuca* species fringe major drainage lines.	VI m6, pd3-4, nd3, e6

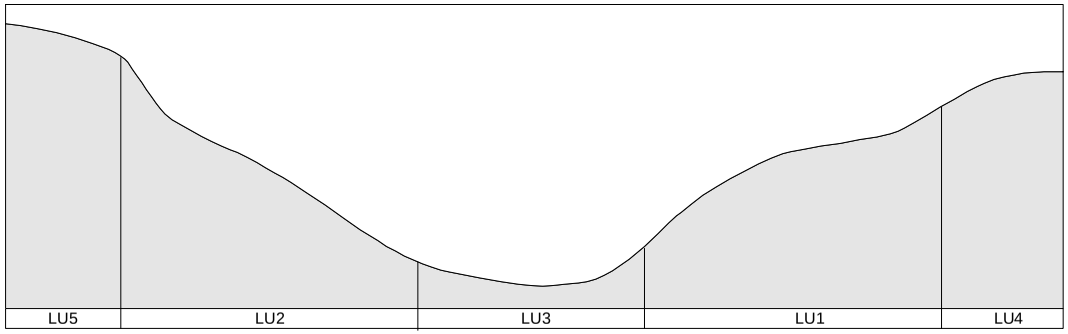
LAND SYSTEM - GOODNIGHT 4 (Gn4)

General Description: Rolling low hills to rolling hills on metasediments. Major soils are shallow to moderately deep, brown and red, uniform, medium textured soils and gradational soils, red and brown, non cracking clays and cracking clays and deep, grey and yellow, sodic duplex soils (Dermosols, Vertosols and Sodosols).

Geology: Goodnights Beds - Slate, phyllite, argilite, chert, jasper, arenite, limestone, basic metavolcanics, diamictite.

Landform: Rolling low hills to rolling hills.

Vegetation: Eucalypt open forest to woodland, limited to extensive clearing. Moreton Bay ash, bloodwoods, silver-leaved ironbark and Queensland blue gum.



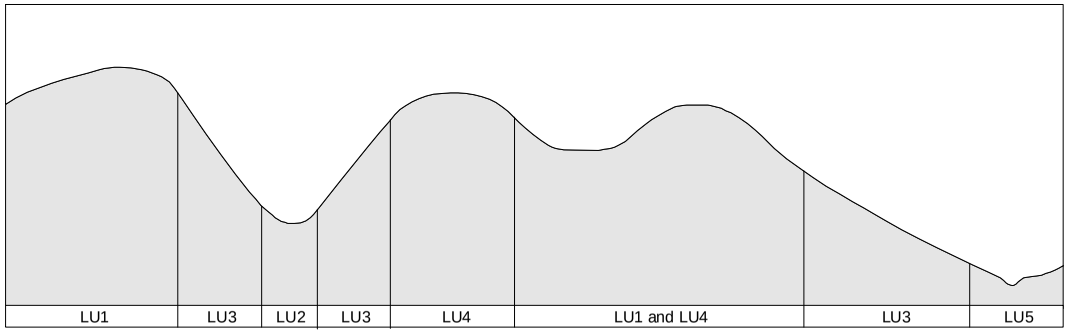
Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	20	Midslopes, 8-20%. Rock outcrop and few to common, surface pebbles and gravel may be present.	Shallow to moderately deep, brown and red, non cracking clays with hardsetting surfaces; light clay, thin to medium A horizons; medium clay B horizons; few to common medium gravel or pebbles throughout profile; neutral to alkaline soil reaction trend. Brown and Red Dermosols.	Eucalypt woodland. Moreton Bay ash, bloodwoods, silver-leaved ironbark and corkwood wattle.	VI m3-4, pd2-3, ps3, nd3, ts6, r3, e6
LU2	25	Midslopes, 15-30%.	Moderately deep to deep, red and brown, uniform, medium textured soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons; clay loam to light clay B horizons, often with medium gravel; acid soil reaction trend. Red and Brown Dermosols.	Eucalypt open forest. Moreton Bay ash, brown bloodwood and Queensland blue gum.	VI-VII m3, ps3, nd3, ts6-7, e6
LU3	10	Broad drainage depressions and lower slopes, 3-10%.	Deep, grey and yellow, sodic duplex soils with hardsetting surfaces; loam to clay loam, medium A horizons, with bleached A2 horizons; medium clay B horizons; alkaline soil reaction trend. Grey and Yellow Sodosols.	Eucalypt woodland. Moreton Bay ash, bloodwoods and beefwood. She-ak and *Melaleuca* species fringe major drainage lines.	VI m6, pd4, ps3, nd3, e6

GOODNIGHT 4 (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU4	25	Crests and upper slopes, 10-20%. Minor rock outcrop and few to many medium pebbles and cobble on surface.	Shallow to moderately deep, red and brown, non cracking and cracking clays with hardsetting or self mulching surfaces; light clay, thin to medium A horizons; light clay to medium clay B horizons, often with medium to coarse gravel throughout profile; neutral to alkaline soil reaction trend. Red and Brown Dermosols and Vertosols.	Eucalypt woodland. Moreton Bay ash and gum topped bloodwood.	VI m3-4, pd2-3, ps3, nd3, r2-3, e6
LU5	20	Higher crests and upper slopes, 20-40%.	Shallow to moderately deep, red and brown, uniform, medium textured soils and non cracking clays with hardsetting surfaces; clay loam to light clay, medium A horizons; clay loam to light clay B horizons, with few to common, medium to coarse gravel or pebbles; acid soil reaction trend. Red and Brown Dermosols.	Eucalypt woodland. Moreton Bay ash, bloodwoods and narrow-leaved ironbark.	VII m3-4, pd3, ps3, ts6-7, e6-7

LAND SYSTEM - GOODNIGHT 5 (Gn5)

General Description: Rolling low hills to steep hills on metasediments. Major soils are very shallow, medium textured soils over rock and shallow to moderately deep, brown, sodic duplex soils (Tenosols, Sodosols and Chromosols).
Geology: Goodnights Beds - Slate, phyllite, argilite, chert, jasper, arenite, limestone, basic metavolcanics, diamictite.
Landform: Rolling low hills to steep hills.
Vegetation: Eucalypt open forest with limited clearing and minor areas extensively cleared. Spotted gum, narrow-leaved ironbark, Queensland blue gum and bloodwoods.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	30	Crests and upper slopes, 2-10%. Minor rock outcrop and few to common, surface cobble.	Shallow, brown, sodic duplex soils with hardsetting surfaces; sandy loam to clay loam, medium A horizons, with bleached A2 horizons; light clay to light medium clay B horizons; common to many medium pebbles or gravel throughout profile; acid to neutral soil reaction trend. Brown Sodosols and Chromosols.	Eucalypt open forest. Spotted gum, narrow-leaved ironbark and bloodwoods.	VI m6, pd3-4, ps3, nd3, r2-3, e6
LU2	10	Lower concave slopes high in the landscape, 3-10%. Surface stone may be present in drainage lines.	Moderately deep, usually mottled, brown, sodic duplex soils with hardsetting surfaces; sandy loam to loam, medium to thick A horizons, with bleached A2 horizons; medium clay B horizons with few to many, medium, gravel or pebbles (sometimes in A horizons); acid to alkaline soil reaction trend. Brown Sodosols and Chromosols.	Eucalypt open forest. Queensland blue gum, narrow-leaved ironbark, spotted gum, rough barked apple and wattles. *Melaleuca* species and river she oaks fringe major streams.	VI m4 or 6, pd2-3, ps3, nd3, r1-4, e6, f3
LU3	35	Upper and mid slopes, 10-40%.	Shallow to moderately deep, brown, sodic duplex soils with hardsetting surfaces; sandy loam to clay loam, thin to medium A horizons, with bleached A2 horizons; light clay to light medium clay B horizons; usually common to many medium pebbles and gravel throughout profile; neutral to alkaline soil reaction trend. Brown Chromosols.	Eucalypt open forest. Spotted gum, narrow-leaved ironbark and bloodwoods.	VII m6, pd2-3, ps3, nd3, ts6-7, e6-7

GOODNIGHT 5 (continued)

Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU4	20	Crests and upper slopes, 5-20%. Medium gravel may be present on surface.	Very shallow, medium textured soils over rock and shallow, red and brown, sodic duplex soils with hardsetting surfaces; clay loam, medium A horizons, usually with bleached A2 horizons; (when present) medium clay B horizons; common, medium gravel or pebbles usually throughout profile; acid to neutral soil reaction trend. Bleached-Leptic Tenosols and Red and Brown Chromosols and Sodosols.	Eucalypt woodland. Narrow-leaved ironbark, spotted gum and Moreton Bay ash.	VI-VII m6, pd3-6, ps3, nd3, ts6, r2-3, e6
LU5	5	Major drainage depressions and flats, <2%. Surface stone may be present in drainage lines.	Moderately deep to deep, brown and yellow, sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium A horizons, with bleached A2 horizons; light to medium clay B horizons; alkaline soil reaction trend. Brown and Yellow Sodosols.	Eucalypt woodland. Moreton Bay ash, narrow-leaved ironbark and Queensland blue gum. *Melaleuca* species and river she-oak fringe major drainage lines.	VI m6, pd3-4, ps3, nd3, r2-3, e6, f3

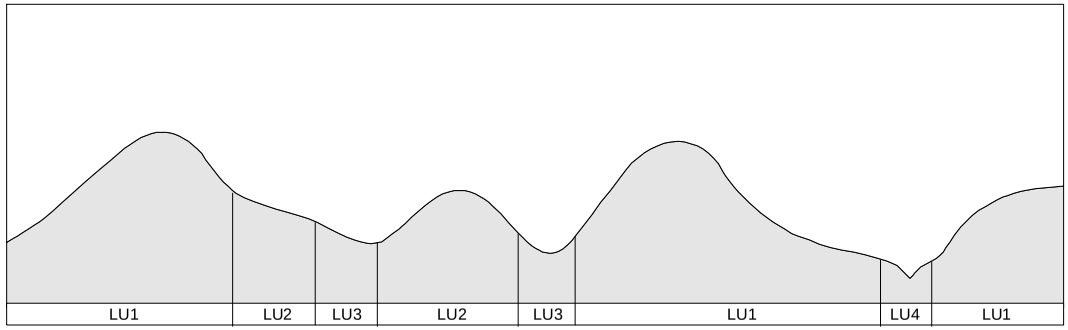
LAND SYSTEM - CURTIS 2 (Ct2)

General Description: Rolling low hills to steep hills on metasediments. Major soils are very shallow, stony, lithosols with minor brown and red, gradational soils (Rudosols, Tenosols, Dermosols and Chromosols).

Geology: Undivided formation of the Carboniferous Curtis Island Group - Micachist, gneiss, amphibolite, quarzite.

Landform: Rolling hills to steep hills.

Vegetation: Eucalypt woodland with limited clearing to no effective disturbance. Spotted gum, narrow-leaved ironbark, Queensland blue gum, Moreton Bay ash and wattles.



Land Unit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	60	Crests and steep slopes, 30-40%, some as high as 60%. Common, cobble and stone on surface. Rock outcrop may be present.	Very shallow to shallow, stony, medium textured soils over rock with hardsetting surfaces; sandy clay loam to clay loam, medium A horizons, with common to abundant, medium gravel; acid soil reaction trend. Leptic Rudosols.	Eucalypt woodland. Spotted gum, narrow-leaved ironbark and wattles.	VII-VIII m6, pd4 or 6, ps3, nd3, r3-4, ts7-8, e7-8
LU2	20	Lower ridges and crests and midslopes, 15-25%.	Shallow to moderately deep, red and brown, gradational and non sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium A horizons; light clay B horizons, usually with fine to medium gravel at depth; acid to neutral soil reaction trend. Red and Brown Dermosols and Chromosols.	Eucalypt woodland. Spotted gum and Queensland blue gum.	VI-VII m4 or 6, pd2-3, ps3, nd3, ts6-7, e6
LU3	10	Concave slopes in upper landscape, 10-15%.	Moderately deep to deep, alluvial soils and brown, gradational soils with hardsetting surfaces; clay loam, medium to thick A horizons; light clay B or D horizons, often with common to abundant medium pebbles and cobble; neutral soil reaction trend. Leptic Tenosols and Brown Dermosols.	Eucalypt woodland. Queensland blue gum, Moreton bay ash and narrow-leaved ironbark.	VI m3-4, ps3, nd3, ts4, e6
LU4	10	Major drainage lines and lower slopes, 2-10%. Cobble and stone common on surface.	Deep, alluvial soils and brown, gradational soils with hardsetting surfaces; sandy clay loam to clay loam, medium A horizons; light clay B or D horizons, pebbles, cobble and stone common throughout the profile; neutral soil reaction trend. Stratic Rudosols and Brown Dermosols.	Eucalypt woodland. Queensland blue gum and Moreton Bay ash. River she-oak and *Melaleuca* species border major drainage lines.	VI m3, ps3, nd3, r3-4, e6, f3

APPENDIX II

Common names of native plant species

Botanical name	Common name
Acacia harpophylla	Brigalow
A. bidwillii	Corkwood
A. rhodoxylon	Rosewood
A. spp.	Wattles
A.shirleyi	Lancewood
Alphitonia excelsa	Red ash
Angophora costata	Rusty gum, smooth barked apple, apple
A. floribunda	Rough barked apple, apple
Araucaria cunninghamii	Hoop pine
Brachychiton rupestre	Bottle tree
B. populneum	Kurrajong
Callitris glaucophylla	White cypress pine
Callistemon spp.	
Casuarina cristata	Belah
C. cunninghamiana	River she-oak
C. inophloia	Thready bark she-oak
C. littoralis	Black she-oak
C. luehmannii	Bulloak
Corymbia intermedia	Pink bloodwood
C. citriodora	Lemon scented gum
C. polycarpa	Long-fruited bloodwood
C. tessellaris	Moreton Bay ash
C. trachyphloia	Brown bloodwood
Eremophila mitchellii	False sandalwood
Eucalyptus acmenoides	White mahogany
E. crebra	Narrow-leaved ironbark
E. maculata	Spotted gum
E. melanophloia	Silver-leaved ironbark
E. moluccana	Gum-topped box
E. orgadophila	Mountain coolibah
E. populnea	Poplar box
E. punctata	Grey gum
E. tereticornis	Queensland blue gum
Flinders australis	Crow’s ash
Geijera parviflora	Wilga
G. striata	Beefwood
Grevillea spp.	
Jacksonia scoparia	Dogwood
Lantana camara	Bush lantana
L. montevidensis	Creeping lantana
Lysicarpus angustifolius	Budgeroo
Macrozamia miquelii	Zamia palm
Macreana microphylla	Small-leaved cottonbush
Melaleuca spp.	Tea trees, paper barks
Owenia acidula	Emu apple
Melaleuca spp.	Tea tree, Paper barks
Petalostigma pubescens	Quinine bush
Lophostemon suaveolens	Swamp mahogany
Xanthorrhoea spp.	Grass tree

APPENDIX III

Dominant and subdominant land classes of the land units within each land system

Land System	Land Unit	Land Unit %	Dominant Class	Subdominant Class
Group 1 Alluvial systems				
Threemoon	1	40	II	II
Threemoon	2	5	III	III
Threemoon	3	20	III	II
Threemoon	4	5	III	III
Threemoon	5	5	IV	IV
Threemoon	6	5	IV	IV
Threemoon	7	5	III	III
Threemoon	8	3	III	III
Threemoon	9	10	II	II
Threemoon	10	2	IV	IV
Ceratodus	1	25	IV	IV
Ceratodus	2	25	IV	III
Ceratodus	3	10	II	II
Ceratodus	4	10	VI	VI
Ceratodus	5	25	VI	IV
Ceratodus	6	5	VII	VII
Grosvenor	1	30	IV	IV
Grosvenor	2	20	III	II
Grosvenor	3	20	III	III
Grosvenor	4	20	III	II
Grosvenor	5	10	VI	VI
Hollywell	1	25	III	III
Hollywell	2	10	IV	IV
Hollywell	3	40	III	III
Hollywell	4	15	III	III
Hollywell	5	10	IV	IV
Group 2 Deeply weathered sediments and basic volcanic rocks				
Mulgildie	1	40	III	III
Mulgildie	2	30	VII	VI
Mulgildie	3	10	III	III
Mulgildie	4	15	IV	III
Mulgildie	5	5	VII	VII
Glenleigh	1	70	III	III
Glenleigh	2	25	III	III
Glenleigh	3	5	VI	VI
Yarrol	1	50	III	III
Yarrol	2	10	VII	V
Yarrol	3	10	IV	III
Yarrol	4	10	IV	IV
Yarrol	5	10	IV	IV
Yarrol	6	10	VII	VI
Coominglah	1	5	VII	VI
Coominglah	2	50	III	III
Coominglah	3	10	III	III
Coominglah	4	3	VI	IV
Coominglah	5	3	VII	VI
Coominglah	6	2	VII	VI
Coominglah	7	10	VI	VI
Coominglah	8	15	VI	VI
Coominglah	9	2	VI	VI
Hungry Hills	1	40	IV	III
Hungry Hills	2	15	IV	III
Hungry Hills	3	10	VII	VI
Hungry Hills	4	3	VII	VI
Hungry Hills	5	2	VI	VI
Hungry Hills	6	15	IV	III
Group 2 Deeply weathered sediments and basic volcanic rocks (continued)				
HungryHills	7	15	IV	III
Hurdle	1	5	VIII	VIII
Hurdle	2	30	VI	VI
Hurdle	3	20	IV	IV
Hurdle	4	5	VII	VI
Hurdle	5	20	VI	VI
Hurdle	6	5	IV	IV
Hurdle	7	5	IV	III
Hurdle	8	2	VI	VI
Hurdle	9	3	VI	VI
Hurdle	10	5	VIII	VIII
Group 3 Deeply weathered, duricrusted sediments and acid intrusive rocks				
Lonepine 1	1	40	VI	VI
Lonepine 1	2	20	VI	VI
Lonepine 1	3	20	VI	IV
Lonepine 1	4	10	VI	IV
Lonepine 1	5	5	VI	VI
Lonepine 1	6	3	VI	VI
Lonepine 1	7	2	III	III
Clonclose 1	1	25	VI	VI
Clonclose 1	2	20	VI	VI
Clonclose 1	3	20	VI	VI
Clonclose 1	4	20	VI	VI
Clonclose 1	5	5	VI	VI
Clonclose 1	6	5	VI	VI
Clonclose 1	7	5	VI	VI
Clonclose 2	1	30	VI	VI
Clonclose 2	2	20	VII	VI
Clonclose 2	3	20	VII	VI
Clonclose 2	4	10	VI	VI
Clonclose 2	5	5	IV	IV
Clonclose 2	6	5	VI	VI
Clonclose 2	7	10	VI	VI
Lonepine 2	1	20	VI	VI
Lonepine 2	2	20	VI	VI
Lonepine 2	3	35	VII	VI
Lonepine 2	4	10	VI	IV
Lonepine 2	5	5	VII	VI
Lonepine 2	6	10	VI	VI
Wingfield 2	1	40	IV	III
Wingfield 2	2	5	III	III
Wingfield 2	3	5	IV	III
Wingfield 2	4	20	VI	VI
WingfIeld 2	5	20	VIII	VII
Wingfield 2	6	5	VII	VI
Wingfield 2	7	5	VI	VI
Group 4 Basic and intermediate intrusive and extrusive igneous rocks				
Muncon 1	1	30	IV	III
Muncon 1	2	35	IV	III
Muncon 1	3	5	III	III
Muncon 1	4	15	IV	III
Muncon 1	5	15	IV	III

Appendix III (continued)

Land System	Land Unit	Land Unit %	Dominant Class	Subdominant Class	Land System	Land Unit	Land Unit %	Dominant Class	Subdominant Class
Group 4 Basic and intermediate, intrusive and extrusive igneous rocks (continued)					**Group 4 Basic and intermediate, intrusive and extrusive igneous rocks (continued)**				
Nogo 1	1	15	IV	III	Wateranga 1	2	15	IV	IV
Nogo 1	2	15	III	III	Wateranga 1	3	20	III	III
Nogo 1	3	5	III	III	Wateranga 1	4	10	III	II
Nogo 1	4	10	III	III	Wateranga 1	5	15	IV	III
Nogo 1	5	10	IV	IV	Wateranga 1	6	15	IV	III
Nogo 1	6	5	IV	IV	Wateranga 1	7	10	III	III
Nogo 1	7	20	III	III	Delubra 2	1	40	IV	III
Nogo 1	8	20	IV	IV	Delubra 2	2	10	VI	VI
Narayen	1	10	IV	IV	Delubra 2	3	5	VI	VI
Narayen	2	10	III	III	Delubra 2	4	20	III	III
Narayen	3	30	III	III	Delubra 2	5	15	III	III
Narayen	4	15	III	III	Delubra 2	6	5	IV	IV
Narayen	5	5	VI	IV	Delubra 2	7	5	IV	IV
Narayen	6	5	VI	IV	Greenbank	1	15	VI	VI
Narayen	7	5	IV	IV	Greenbank	2	15	VII	VI
Narayen	8	5	VI	IV	Greenbank	3	10	VI	IV
Narayen	9	5	VI	III	Greenbank	4	25	V	IV
Narayen	10	5	VI	IV	Greenbank	5	25	VI	IV
Narayen	11	5	VI	VI	Greenbank	6	5	VI	IV
Hindmarsh 1	1	3	VIII	VI	Greenbank	7	5	VI	VI
Hindmarsh 1	2	30	IV	III	Hindmarsh 3	1	20	III	III
Hindmarsh 1	3	3	IV	III	Hindmarsh 3	2	10	VII	VI
Hindmarsh 1	4	5	IV	III	Hindmarsh 3	3	15	IV	III
Hindmarsh 1	5	5	IV	III	Hindmarsh 3	4	15	IV	IV
Hindmarsh 1	6	2	VII	VI	Hindmarsh 3	5	10	IV	III
Hindmarsh 1	7	5	IV	III	Hindmarsh 3	6	5	VII	VI
Hindmarsh 1	8	2	III	II	Hindmarsh 3	7	5	VI	IV
Hindmarsh 1	9	5	IV	III	Hindmarsh 3	8	20	IV	III
Hindmarsh 1	10	5	III	III	Owlgully 1	1	35	VII	VI
Hindmarsh 1	11	30	III	II	Owlgully 1	2	25	VI	VI
Hindmarsh 1	12	5	IV	III	Owlgully 1	3	5	VI	IV
Delubra 1	1	20	VII	VI	Owlgully 1	4	10	III	III
Delubra 1	2	25	VI	IV	Owlgully 1	5	5	III	III
Delubra 1	3	5	III	III	Owlgully 1	6	10	III	III
Delubra 1	4	25	III	III	Owlgully 1	7	5	VI	VI
Delubra 1	5	10	IV	IV	Owlgully 1	8	5	VI	VI
Delubra 1	6	5	III	III	Nogo 3	1	20	VI	VI
Delubra 1	7	10	VI	VI	Nogo 3	2	20	VI	VI
Brumby	1	30	VII	VII	Nogo 3	3	10	IV	IV
Brumby	2	10	IV	IV	Nogo 3	4	10	IV	III
Brumby	3	50	III	III	Nogo 3	5	5	VI	III
Brumby	4	10	III	III	Nogo 3	6	15	IV	III
Hindmarsh 2	1	35	IV	III	Nogo 3	7	15	III	III
Hindmarsh 2	2	20	III	III	Nogo 3	8	3	VI	VI
Hindmarsh 2	3	10	III	II	Nogo 3	9	2	VII	VII
Hindmarsh 2	4	10	VI	IV	Muncon 2	1	15	VI	VI
Hindmarsh 2	5	5	VI	V	Muncon 2	2	25	IV	III
Hindmarsh 2	6	5	IV	III	Muncon 2	3	15	IV	IV
Hindmarsh 2	7	5	IV	III	Muncon 2	4	5	VI	VI
Hindmarsh 2	8	5	VI	VI	Muncon 2	5	15	VII	VII
Hindmarsh 2	9	5	III	III	Muncon 2	6	20	IV	III
Nogo 2	1	35	III	III	Muncon 2	7	5	III	II
Nogo 2	2	15	III	III	Goondicum	1	55	III	III
Nogo 2	3	15	IV	III	Goondicum	2	15	VI	VI
Nogo 2	4	10	VI	IV	Goondicum	3	15	III	II
Nogo 2	5	3	IV	IV	Goondicum	4	15	VI	IV
Nogo 2	6	2	VI	VI	Goondicum	5	15	IV	III
Nogo 2	7	5	VI	VI	Goondicum	6	5	VII	VI
Nogo 2	8	5	IV	IV	Goondicum	7	25	IV	III
Nogo 2	9	10	III	III	Goondicum	8	5	VII	VI
Wateranga 1	1	15	IV	III	Kariboe	1	35	VI	VI

Appendix III (continued)

Land System	Land Unit	Land Unit %	Dominant Class	Subdominant Class
Group 4 Basic and intermediate, intrusive and extrusive igneous rocks (continued)				
Kariboe	2	25	VII	VI
Kariboe	3	10	VI	VI
Kariboe	4	15	IV	IV
Kariboe	5	5	VI	VI
Kariboe	6	10	IV	IV
Wateranga 2	1	30	VII	VI
Wateranga 2	2	40	VIII	VII
Wateranga 2	3	20	VI	VI
Wateranga 2	4	10	IV	III
Muncon 3	1	30	VIII	VI
Muncon 3	2	10	VII	VI
Muncon 3	3	30	VII	VII
Muncon 3	4	5	VII	VI
Muncon 3	5	5	VII	VI
Muncon 3	6	5	VI	VI
Muncon 3	7	5	VI	VI
Muncon 3	8	2	VII	VI
Muncon 3	9	5	VIII	VI
Muncon 3	10	3	VI	VI
Owlgully 2	1	50	VIII	VII
Owlgully 2	2	20	VI	VI
Owlgully 2	3	20	VII	VI
Owlgully 2	4	5	IV	III
Owlgully 2	5	5	III	II
Hindmarsh 4	1	30	VIII	VII
Hindmarsh 4	2	20	VII	VI
Hindmarsh 4	3	15	VII	VI
Hindmarsh 4	4	5	VII	VI
Hindmarsh 4	5	15	VII	VII
Hindmarsh 4	6	15	VII	VII
Group 5 Acid volcanic rocks				
Aranbanga 1	1	45	VIII	VIII
Aranbanga 1	2	35	VIII	VIII
Aranbanga 1	3	10	VI	IV
Aranbanga 1	4	5	VII	VI
Aranbanga 1	5	5	IV	III
Aranbanga 2	1	5	VI	VI
Aranbanga 2	2	20	VII	VI
Aranbanga 2	3	20	VII	VI
Aranbanga 2	4	5	VI	VI
Aranbanga 2	5	20	VI	VI
Aranbanga 2	6	25	VII	VI
Aranbanga 2	7	3	VI	IV
Aranbanga 2	8	2	V	V
Torsdale	1	30	VI	VI
Torsdale	2	20	VI	VI
Torsdale	3	20	IV	IV
Torsdale	4	10	VII	VI
Torsdale	5	10	VI	VI
Torsdale	6	10	VI	VI
Aranbanga 3	1	20	VII	VII
Aranbanga 3	2	2	VII	VI
Aranbanga 3	3	30	VII	VI
Aranbanga 3	4	2	VI	VI
Aranbanga 3	5	25	VII	VI
Aranbanga 3	6	20	VII	VI
Aranbanga 3	7	1	VI	IV
Aranbanga 4	1	25	VI	IV
Aranbanga 4	2	10	VII	VI
Aranbanga 4	3	35	VI	VI
Group 5 Acid volcanic rocks (continued)				
Aranbanga 4	4	5	VI	VI
Aranbanga 4	5	10	IV	IV
Aranbanga 4	6	5	VI	VI
Aranbanga 4	7	10	VI	VI
Eagle	1	40	VI	VI
Eagle	2	35	VI	VII
Eagle	3	25	VI	VI
Aranbanga 5	1	10	VII	VII
Aranbanga 5	2	40	VIII	VII
Aranbanga 5	3	5	VI	VI
Aranbanga 5	4	20	VII	VI
Aranbanga 5	5	5	VII	VI
Aranbanga 5	6	5	VI	VI
Aranbanga 5	7	5	IV	IV
Aranbanga 5	8	5	VI	VI
Aranbanga 5	9	5	IV	IV
Group 6 Acid intrusive rocks				
Moocoo	1	10	IV	III
Moocoo	2	10	IV	III
Moocoo	3	5	VI	VI
Moocoo	4	10	III	III
Moocoo	5	5	VI	VI
Moocoo	6	10	VI	VI
Moocoo	7	25	VI	IV
Moocoo	8	20	IV	III
Moocoo	9	5	VI	VI
Glandore	1	5	VI	VI
Glandore	2	40	VI	IV
Glandore	3	10	VI	IV
Glandore	4	25	IV	IV
Glandore	5	15	VI	VI
Glandore	6	5	VI	VI
Mingo	1	15	VI	VI
Mingo	2	25	VI	VI
Mingo	3	10	VI	VI
Mingo	4	20	VI	VI
Mingo	5	30	VI	VI
Lochabar	1	25	VI	VI
Lochabar	2	35	VI	VI
Lochabar	3	15	VI	VI
Lochabar	4	25	VI	VI
Cheltenham	1	10	VI	VI
Cheltenham	2	5	VI	VI
Cheltenham	3	25	VI	VI
Cheltenham	4	40	VI	VI
Cheltenham	5	15	VI	VI
Cheltenham	6	3	VI	VI
Cheltenham	7	2	VI	VI
Crystalvale	1	15	VI	VI
Crystalvale	2	15	VI	VI
Crystalvale	3	5	IV	IV
Crystalvale	4	15	VI	VI
Crystalvale	5	5	VI	VI
Crystalvale	6	15	VI	VI
Crystalvale	7	5	VI	VI
Crystalvale	8	15	VI	VI
Crystalvale	9	10	IV	IV
Coonambula	1	25	VII	VI
Coonambula	2	35	VII	VI
Coonambula	3	10	VI	VI
Coonambula	4	10	VI	VI

Appendix III (continued)

Land System	Land Unit	Land Unit %	Dominant Class	Subdominant Class
Group 6 Acid intrusive rocks (continued)				
Coonambula	5	15	VII	VI
Coonambula	6	5	VI	VI
Briggs 1	1	30	VII	VI
Briggs 1	2	30	VI	VI
Briggs 1	3	15	VI	VI
Briggs 1	4	20	VI	VI
Briggs 1	5	5	IV	IV
Culcraigie	1	35	VI	VI
Culcraigie	2	40	VI	VI
Culcraigie	3	10	VI	VI
Culcraigie	4	10	VI	VI
Culcraigie	5	5	VI	VI
Perry 1	1	30	VII	VI
Perry 1	2	35	VI	VI
Perry 1	3	10	VI	VI
Perry 1	4	10	VI	VI
Perry 1	5	10	VI	VI
Perry 1	6	5	VI	VI
Raspberry 1	1	40	VI	VI
Raspberry 1	2	30	VI	VI
Raspberry 1	3	20	VII	VI
Raspberry 1	4	10	VI	VI
Rawbelle	1	40	VII	VI
Rawbelle	2	35	VII	VI
Rawbelle	3	5	VII	VI
Rawbelle	4	5	VII	VI
Rawbelle	5	5	VI	VI
Rawbelle	6	5	VI	VI
Rawbelle	7	5	VI	VI
Wingfield 1	1	10	VII	VI
Wingfield 1	2	3	VII	VI
Wingfield 1	3	30	VI	VI
Wingfield 1	4	20	VI	VI
Wingfield 1	5	10	VI	VI
Wingfield 1	6	5	VI	VI
Wingfield 1	7	5	VI	VI
Wingfield 1	8	10	VI	VI
Wingfield 1	9	5	VI	VI
Wingfield 1	10	2	IV	III
Wonbah	1	25	VII	VI
Wonbah	2	5	VI	VI
Wonbah	3	15	VII	VI
Wonbah	4	5	VI	VI
Wonbah	5	20	VI	VI
Wonbah	6	3	VI	VI
Wonbah	7	20	VI	VI
Wonbah	8	3	VI	VI
Wonbah	9	2	III	III
Wonbah	10	2	VI	VI
Nour	1	15	VI	VI
Nour	2	40	VI	VI
Nour	3	15	VI	VI
Nour	4	25	VI	VI
Nour	5	5	VI	VI
Eidsvold	1	40	VIII	VII
Eidsvold	2	5	VII	VI
Eidsvold	3	15	VI	VI
Eidsvold	4	10	VI	VI
Eidsvold	5	10	VI	VI
Eidsvold	6	10	VI	VI
Eidsvold	7	10	III	III
Briggs 2	1	35	VII	VI
Group 6 Acid intrusive rocks (continued)				
Briggs 2	2	5	VI	VI
Briggs 2	3	20	VI	VI
Briggs 2	4	5	IV	VI
Briggs 2	5	10	VII	VI
Briggs 2	6	10	VI	VI
Briggs 2	7	5	VI	VI
Briggs 2	8	10	VI	VI
Gaeta	1	20	VII	VI
Gaeta	2	25	VII	VI
Gaeta	3	10	VI	VI
Gaeta	4	5	VI	VI
Gaeta	5	20	VII	VII
Gaeta	6	15	VII	VI
Gaeta	7	5	VIII	VII
Boolgal	1	45	VIII	VII
Boolgal	2	35	VII	VII
Boolgal	3	10	VI	VI
Boolgal	4	5	VII	VI
Boolgal	5	5	VII	VII
Hogback	1	3	VI	VI
Hogback	2	5	VI	VI
Hogback	3	50	VIII	VII
Hogback	4	10	VII	VI
Hogback	5	15	VII	VII
Hogback	6	15	VII	VI
Hogback	7	2	V	V
Perry 2	1	20	VII	VI
Perry 2	2	50	VIII	VII
Perry 2	3	10	VI	VI
Perry 2	4	20	VII	VI
Raspberry 2	1	60	VIII	VII
Raspberry 2	2	15	VII	VI
Raspberry 2	3	25	VII	VI
Wolca	1	25	VII	VII
Wolca	2	5	VII	VI
Wolca	3	20	VII	VI
Wolca	4	20	VII	VI
Wolca	5	10	VI	VI
Wolca	6	15	VI	VI
Wolca	7	3	VI	VI
Wolca	8	2	VI	VI
Group 7 Sedimentary rocks				
Evergreen 1	1	20	VI	VI
Evergreen 1	2	30	VI	VI
Evergreen 1	3	30	VI	VI
Evergreen 1	4	20	VI	VI
Evergreen 2	1	10	III	III
Evergreen 2	2	30	III	III
Evergreen 2	3	15	III	III
Evergreen 2	4	10	IV	IV
Evergreen 2	5	3	III	III
Evergreen 2	6	2	III	III
Evergreen 2	7	10	IV	III
Evergreen 2	8	20	III	III
Evergreen 3	1	10	VI	VI
Evergreen 3	2	15	VI	VI
Evergreen 3	3	15	VI	VI
Evergreen 3	4	40	III	III
Evergreen 3	5	20	VI	VI
Monto	1	20	III	III
Monto	2	25	III	III

Appendix III (continued)

Land System	Land Unit	Land Unit %	Dominant Class	Subdominant Class	Land System	Land Unit	Land Unit %	Dominant Class	Subdominant Class
Group 7 Sedimentary rocks (continued)					**Group 7 Sedimentary rocks (continued)**				
Monto	3	5	III	III	Cynthia	5	15	III	III
Monto	4	10	III	III	Cynthia	6	10	IV	IV
Monto	5	20	III	III	Cynthia	7	20	III	III
Monto	6	10	III	III	Cynthia	8	10	IV	III
Monto	7	5	III	III	Cynthia	9	10	III	III
Monto	8	5	VI	VI	Hutton 1	1	30	VI	IV
Trapyard	1	10	VI	VI	Hutton 1	2	20	VI	IV
Trapyard	2	5	VII	VI	Hutton 1	3	20	VI	IV
Trapyard	3	5	VI	VI	Hutton 1	4	10	VI	VI
Trapyard	4	10	III	III	Hutton 1	5	10	III	III
Trapyard	5	30	III	III	Hutton 1	6	5	III	III
Trapyard	6	20	III	III	Hutton 1	7	5	III	III
Trapyard	7	20	III	III	Hutton 2	1	5	VI	VI
Kapaldo	1	2	VII	VII	Hutton 2	2	10	VI	VI
Kapaldo	2	30	IV	III	Hutton 2	3	5	VI	VI
Kapaldo	3	3	VI	VI	Hutton 2	4	15	VI	VI
Kapaldo	4	5	VII	VI	Hutton 2	5	10	VI	VI
Kapaldo	5	5	VI	IV	Hutton 2	6	20	VI	VI
Kapaldo	6	5	IV	III	Hutton 2	7	15	VI	VI
Kapaldo	7	20	III	III	Hutton 2	8	20	VI	VI
Kapaldo	8	5	III	III	Caswell 2	1	5	VI	VI
Kapaldo	9	25	III	III	Caswell 2	2	5	IV	III
Scalper	1	10	VI	VI	Caswell 2	3	15	VI	VI
Scalper	2	20	IV	III	Caswell 2	4	25	VI	VI
Scalper	3	15	III	III	Caswell 2	5	20	VI	IV
Scalper	4	5	VI	VI	Caswell 2	6	20	VI	IV
Scalper	5	20	VI	IV	Caswell 2	7	5	IV	III
Scalper	6	5	VI	VI	Caswell 2	8	5	IV	IV
Scalper	7	20	IV	IV	Evergreen 6	1	10	VI	VI
Scalper	8	5	VI	VI	Evergreen 6	2	15	VI	IV
Evergreen 4	1	5	VII	VI	Evergreen 6	3	5	VI	VI
Evergreen 4	2	10	IV	III	Evergreen 6	4	20	IV	IV
Evergreen 4	3	20	VI	VI	Evergreen 6	5	15	IV	IV
Evergreen 4	4	10	IV	III	Evergreen 6	6	10	IV	IV
Evergreen 4	5	20	IV	III	Evergreen 6	7	5	VI	VI
Evergreen 4	6	30	IV	III	Evergreen 6	8	10	VI	IV
Evergreen 4	7	5	VII	VI	Evergreen 6	9	10	III	III
Caswell 1	1	20	VII	VI	Evergreen 7	1	10	IV	IV
Caswell 1	2	30	VI	VI	Evergreen 7	2	15	IV	III
Caswell 1	3	5	VI	III	Evergreen 7	3	10	IV	III
Caswell 1	4	15	VII	VI	Evergreen 7	4	15	III	III
Caswell 1	5	15	IV	III	Evergreen 7	5	20	III	III
Caswell 1	6	10	IV	III	Evergreen 7	6	10	IV	III
Caswell 1	7	5	VI	VI	Evergreen 7	7	20	IV	III
Evergreen 5	1	5	VII	VII	Evergreen 8	1	40	VI	VI
Evergreen 5	2	10	VI	VI	Evergreen 8	2	40	VI	VI
Evergreen 5	3	3	VII	VII	Evergreen 8	3	5	VI	VI
Evergreen 5	4	15	VI	IV	Evergreen 8	4	5	III	III
Evergreen 5	5	3	VII	VII	Evergreen 8	5	10	III	III
Evergreen 5	6	2	III	III	Evergreen 9	1	30	VI	IV
Evergreen 5	7	30	VI	VI	Evergreen 9	2	5	VI	VI
Evergreen 5	8	20	III	III	Evergreen 9	3	30	VI	IV
Evergreen 5	9	10	III	III	Evergreen 9	4	20	VI	VI
Evergreen 5	10	2	III	III	Evergreen 9	5	10	VI	VI
Bania 1	1	30	VII	VI	Evergreen 9	6	5	VI	VI
Bania 1	2	40	VIII	VI	Harrami	1	5	IV	IV
Bania 1	3	25	VI	VI	Harrami	2	20	IV	IV
Bania 1	4	5	IV	IV	Harrami	3	5	IV	IV
Cynthia	1	5	VI	VI	Harrami	4	10	IV	IV
Cynthia	2	10	VI	VI	Harrami	5	10	IV	IV
Cynthia	3	5	VI	VI	Harrami	6	3	IV	IV
Cynthia	4	15	VI	VI	Harrami	7	30	IV	III

Appendix III (continued)

Land System	Land Unit	Land Unit %	Dominant Class	Subdominant Class
Group 7 Sedimentary rocks (continued)				
Harrami	8	15	IV	III
Harrami	9	2	III	III
Monal 1	1	30	VI	VI
Monal 1	2	25	IV	IV
Monal 1	3	15	III	III
Monal 1	4	15	VI	VI
Monal 1	5	15	VI	VI
Youlambie	1	30	VII	VI
Youlambie	2	20	VI	VI
Youlambie	3	5	VI	VI
Youlambie	4	10	VI	VI
Youlambie	5	2	VI	VI
Youlambie	6	30	VII	VII
Youlambie	7	3	VI	IV
Caswell 3	1	20	VII	VI
Caswell 3	2	30	VI	VI
Caswell 3	3	8	VI	VI
Caswell 3	4	25	VI	VI
Caswell 3	5	10	VI	VI
Caswell 3	6	7	VI	III
Evergreen 10	1	10	VII	VI
Evergreen 10	2	30	VII	VI
Evergreen 10	3	5	VI	VI
Evergreen 10	4	5	VI	VI
Evergreen 10	5	20	VII	VII
Evergreen 10	6	10	VII	VI
Evergreen 10	7	10	IV	IV
Evergreen 10	8	5	VI	VI
Evergreen 10	9	5	VI	VI
Cannidah	1	40	VIII	VII
Cannidah	2	30	VII	VI
Cannidah	3	10	IV	III
Cannidah	4	10	IV	III
Cannidah	5	10	III	III
Caswell 4	1	10	VII	VI
Caswell 4	2	5	VII	VI
Caswell 4	3	5	VIII	VII
Caswell 4	4	20	VII	VI
Caswell 4	5	10	V	III
Caswell 4	6	15	VI	VI
Caswell 4	7	5	VI	VI
Caswell 4	8	5	VII	VI
Caswell 4	9	10	VII	VI
Caswell 4	10	15	VI	VI
Monal 2	1	20	VI	VI
Monal 2	2	20	VI	VII
Monal 2	3	10	VI	VI
Monal 2	4	10	VI	VI
Monal 2	5	30	VIII	VII
Monal 2	6	10	VI	VI
Bania 2	1	20	VI	VI
Bania 2	2	20	VII	VII
Bania 2	3	5	VI	VI
Bania 2	4	5	VII	VI
Bania 2	5	5	VII	VI
Bania 2	6	25	VI	VI
Bania 2	7	10	IV	IV
Bania 2	8	5	IV	IV
Bania 2	9	5	IV	IV
Hutton 3	1	25	VI	VI
Hutton 3	2	25	VI	VI
Hutton 3	3	3	VI	VI
Hutton 3	4	35	VII	VII
Hutton 3	5	5	VI	VI
Hutton 3	6	2	VI	VI
Hutton 3	7	5	VI	VI
Caswell 5	1	30	VI	VI
Caswell 5	2	25	VII	VI
Caswell 5	3	5	VI	VI
Caswell 5	4	20	VI	VI
Caswell 5	5	15	VI	VI
Caswell 5	6	5	VI	VI
Precipice	1	20	VIII	VIII
Precipice	2	5	VIII	VIII
Precipice	3	30	VI	VI
Precipice	4	20	VI	VI
Precipice	5	10	VI	VI
Precipice	6	10	VI	VI
Precipice	7	5	VI	VI
Group 8 Metamorphic rocks				
Goodnight 1	1	45	VII	VI
Goodnight 1	2	30	VI	VI
Goodnight 1	3	10	VI	VI
Goodnight 1	4	10	VI	VI
Goodnight 1	5	5	VI	VI
Goodnight 2	1	45	VI	VI
Goodnight 2	2	20	VI	VI
Goodnight 2	3	20	VI	VI
Goodnight 2	4	5	VI	VI
Goodnight 2	5	10	IV	IV
Goodnight 3	1	60	VI	VI
Goodnight 3	2	25	VII	VI
Goodnight 3	3	15	VI	VI
Curtis 1	1	40	VI	VI
Curtis 1	2	10	VI	VI
Curtis 1	3	25	VI	VI
Curtis 1	4	20	VI	VI
Curtis 1	5	5	VI	VI
Goodnight 4	1	20	VI	VI
Goodnight 4	2	25	VII	VI
Goodnight 4	3	10	VI	VI
Goodnight 4	4	25	VI	VI
Goodnight 4	5	20	VII	VII
Goodnight 5	1	30	VI	VI
Goodnight 5	2	10	VI	VI
Goodnight 5	3	35	VII	VII
Goodnight 5	4	20	VII	VI
Goodnight 5	5	5	VI	VI
Curtis 2	1	60	VIII	VII
Curtis 2	2	20	VII	VI
Curtis 2	3	10	VI	VI
Curtis 2	4	10	VI	VI

APPENDIX IV

Dominant and subdominant land classes of the mapping units for the North Burnett area

UMA number	Code	Land System	Land Capability		Area (ha)	UMA number	Code	Land System	Land Capability		Area (ha)
			D*	S+					D*	S+	
412	Tm	Threemoon	II	III	2739	287	Eg2	Evergreen 2	III	IV	1382
361	Tm	Threemoon	II	III	10031	478	Hm1	Hindmarsh 1	III	IV	2327
355	Tm	Threemoon	II	III	1582	290	Eg7	Evergreen 7	III	IV	912
493	Tm	Threemoon	II	III	124	291	Cd	Ceratodus	III	IV	8483
370	Gl	Glenleigh	III	III	893	226	Gv	Grosvenor	III	IV	212
363	Mt	Monto	III	III	10223	294	Eg2	Evergreen 2	III	IV	208
339	Ng1/2	Nogo1/2	III	IV	1756	300	Gv	Grosvenor	III	IV	114
61	Cd	Ceratodus	III	IV	94	231	Ng1	Nogo 1	III	IV	122
62	Gv	Grosvenor	III	IV	769	35	Db1	Delubra 1	III	VI	3217
359	Kp	Kapaldo	III	IV	3809	253	Db1	Delubra 1	III	VI	518
187	Wg1	Wateranga 1	III	IV	1414	254	Db1	Delubra1	III	VI	184
153	Hw	Hollywell	III	IV	1012	78	Cd	Ceratodus	III	VI	159
64	Cd	Ceratodus	III	IV	1890	255	Db1	Delubra 1	III	VI	52
183	Gv	Grosvenor	III	IV	386	100	Db1	Delubra 1	III	VI	239
179	Gv/Hw	Grosvenor/Honeywell	III	IV	1009	490	Cm	Coominglah	III	VI	381
65	Gv	Grosvenor	III	IV	2645	474	Ty	Trapyard	III	VI	1842
66	Ng2	Nogo 2	III	IV	1433	98	Db1	Delubra 1	III	VI	6255
194	Wg1	Wateranga 1	III	IV	342	304	Cy	Cynthia	III	VI	1370
69	Ng2	Nogo 2	III	IV	141	399	Cm	Coominglah	III	VI	12775
70	Ng2	Nogo 2	III	IV	198	476	Bb	Brumby	III	VII	660
481	Hm1	Hindmarsh 1	III	IV	2447	362	Md	Mulgildie	III	VII	2040
76	Ng2	Nogo 2	III	IV	775	408	Mc1/2	Muncon 1/2	IV	III	317
132	Ng2	Nogo 2	III	IV	7358	215	Hh	Hungry Hills	IV	III	2668
441	Kp	Kapaldo	III	IV	582	467	Hr	Harrami	IV	III	22511
136	Cd	Ceratodus	III	IV	96	353	Mc1	Muncon 1	IV	III	2317
77	Cd	Ceratodus	III	IV	87	119	Db2	Delubra 2	IV	III	149
145	Gv	Grosvenor	III	IV	707	513	Hm3	Hindmarsh 3	IV	III	163
150	Hw	Hollywell	III	IV	408	484	Mc1/2	Muncon 1/2	IV	III	1162
380	Hm1	Hindmarsh 1	III	IV	5253	384	Db2	Delubra 2	IV	III	4714
79	Ng1	Nogo 1	III	IV	1995	509	Hm3	Hindmarsh 3	IV	III	1383
515	Hm1	Hindmarsh 1	III	IV	61	256	Db2	Delubra 2	IV	III	4421
475	Hm1	Hindmarsh 1	III	IV	1021	247	Mo	Moocoo	IV	VI	57
417	Yr	Yarrol	III	IV	7465	411	Mc2	Muncon 2	IV	VI	136
463	Hm2	Hindmarsh 2	III	IV	9321	248	Mo	Moocoo	IV	VI	126
268	Ng2	Nogo 2	III	IV	1875	246	Db1/2	Delubra 1/2	IV	VI	273
466	Hm1	Hindmarsh 1	III	IV	2032	115	Db1/2	Delubra 1/2	IV	VI	654
468	Hm2	Hindmarsh 2	III	IV	4472	250	Mo	Moocoo	IV	VI	619
406	Kp	Kapaldo	III	IV	570	230	Eg4	Evergreen 4	IV	VI	113
473	Hm1	Hindmarsh 1	III	IV	58	251	Mo	Moocoo	IV	VI	313
189	Gv	Grosvenor	III	IV	222	420	Yr	Yarrol	IV	VI	276
455	Hm2	Hindmarsh 2	III	IV	568	252	Db1/2	Delubra 1/2	IV	VI	290
223	Eg2	Evergreen 2	III	IV	2642	110	Db1	Delubra1	IV	VI	167
419	Eg7	Evergreen 7	III	IV	539	427	Gc	Goondicum	IV	VI	3344
547	Hm1	Hindmarsh 1	III	IV	100	438	Mc2	Muncon 2	IV	VI	277
228	Gv	Grosvenor	III	IV	238	249	Mo	Moocoo	IV	VI	70
41	Na	Narayen	III	IV	13001	402	Eg4	Evergreen 4	IV	VI	510

* D – Dominant
\+ S - Subdominant

Appendix IV (continued)

UMA number	Code	Land System	Land Capability D*	Land Capability S+	Area (ha)	UMA number	Code	Land System	Land Capability D*	Land Capability S+	Area (ha)
379	Hm2	Hindmarsh 2	IV	VI	348	154	Ht1	Hutton 1	VI	IV	548
374	Eg4	Evergreen 4	IV	VI	1245	152	Ht1	Hutton 1	VI	IV	281
372	Eg4/6	Evergreen 4/6	IV	VI	302	385	Gd	Glandore	VI	IV	8561
371	Eg4	Evergreen 4	IV	VI	485	508	Cw2	Caswell 2	VI	IV	396
396	Hm2	Hindmarsh 2	IV	VI	1061	303	Cy	Cynthia	VI	IV	894
277	Eg6	Evergreen 6	IV	VI	971	416	Cw1	Caswell 1	VI	IV	2902
401	Eg4	Evergreen 4	IV	VI	381	275	Ng3	Nogo 3	VI	IV	1525
245	Db1/2	Delubra 1/2	IV	VI	478	548	Kb	Kariboe	VI	IV	61
117	Db1/2	Delubra 1/2	IV	VI	314	286	Eg9	Evergreen 9	VI	IV	328
289	Eg4	Evergreen 4	IV	VI	141	288	Eg9	Evergreen 9	VI	IV	38
229	Eg6	Evergreen 6	IV	VI	242	541	Kb	Kariboe	VI	IV	3395
279	Eg4	Evergreen 4	IV	VI	735	297	Ht1	Hutton 1	VI	IV	442
271	Eg6	Evergreen 6	IV	VI	3276	298	Eg9	Evergreen 9	VI	IV	334
407	Mc2	Muncon 2	IV	VI	874	524	Cw2	Caswell 2	VI	IV	705
398	Wf2	Wingfield 2	IV	VI	2520	301	Cw2	Caswell 2	VI	IV	705
506	Mc2	Muncon 2	IV	VI	3185	350	Cw1	Caswell 1	VI	IV	1868
460	Hm2	Hindmarsh 2	IV	VI	56	305	Cw2	Caswell 2	VI	IV	309
102	Db1/2	Delubra 1/2	IV	VI	91	221	Ht1	Hutton 1	VI	IV	877
459	Hm2	Hindmarsh 2	IV	VI	66	220	Ht1	Hutton 1	VI	IV	1022
34	Db2\Rb	Delubra2\Rawbelle	IV	VI	4818	217	Cw1	Caswell 1	VI	IV	421
461	Hm2	Hindmarsh 2	IV	VI	24	213	Cw2	Caswell 2	VI	IV	16044
37	Na	Narayen	IV	VI	703	354	Cw2	Caswell 2	VI	IV	271
458	Hm2	Hindmarsh 2	IV	VI	41	325	Gb	Greenbank	VI	IV	1227
91	Db1/2	Delubra 1/2	IV	VI	310	523	Mn1	Monal 1	VI	IV	1488
510	Mc2	Muncon 2	IV	VI	1308	347	Cw2	Caswell 2	VI	IV	1101
453	Eg4	Evergreen 4	IV	VI	520	299	Eg9	Evergreen 9	VI	IV	60
535	Mc2	Muncon 2	IV	VI	1684	433	Cw2	Caswell 2	VI	IV	534
425	Og1	Owlgully 1	VI	III	504	422	Cw2	Caswell 2	VI	IV	61
423	Og1	Owlgully 1	VI	III	556	414	Cw2	Caswell 2	VI	IV	3730
530	Og1	Owlgully 1	VI	III	1931	448	Eg9	Evergreen 9	VI	IV	267
107	Eg3	Evergreen 3	VI	III	98	431	Cw1	Caswell 1	VI	IV	217
104	Eg3	Evergreen 3	VI	III	79	472	Sp	Scalper	VI	IV	1562
452	Eg5	Evergreen 5	VI	III	2909	479	Sp	Scalper	VI	IV	525
507	Og1	Owlgully 1	VI	III	855	436	Cw2	Caswell 2	VI	IV	275
495	Og1	Owlgully 1	VI	III	1941	437	Cw1	Caswell 1	VI	IV	2797
4	Eg3	Evergreen 3	VI	III	76	449	Eg9	Evergreen 9	VI	IV	1288
2	Eg3	Evergreen 3	VI	III	1207	440	Cw2	Caswell 2	VI	IV	3637
356	Cw2	Caswell 2	VI	IV	249	445	Cw2	Caswell 2	VI	IV	644
164	Cw1	Caswell 1	VI	IV	63	395	Cw2	Caswell 2	VI	IV	387
158	Cw1	Caswell 1	VI	IV	356	393	Gd	Glandore	VI	IV	208
71	Ng3	Nogo3	VI	IV	6852	443	Cw2	Caswell 2	VI	IV	2050
409	Cw1	Caswell 1	VI	IV	639	432	Cw2	Caswell 2	VI	IV	2554
364	Eg9	Evergreen 9	VI	IV	225	204	Br1	Briggs 1	VI	VI	2762
157	Cw1	Caswell 1	VI	IV	2820	16	Lp1	Lonepine 1	VI	VI	29952
503	Cw2	Caswell 2	VI	IV	699	219	Ht2	Hutton 2	VI	VI	1008
501	Cw2	Caswell 2	VI	IV	804	550	Cw3	Caswell 3	VI	VI	3147
377	Eg9	Evergreen 9	VI	IV	109	233	Wf1	Wingfield 1	VI	VI	4098

* D – Dominant
\+ S - Subdominant

Appendix IV (continued)

UMA number	Code	Land System	Land Capability		Area (ha)	UMA number	Code	Land System	Land Capability		Area (ha)
			D*	S+					D*	S+	
428	Cw3	Caswell 3	VI	VI	2338	118	Cc1	Clonclose 1	VI	VI	46276
315	Cw3	Caswell 3	VI	VI	1243	487	Wf1	Wingfield 1	VI	VI	479
424	Cw3	Caswell 3	VI	VI	304	360	Ht2	Hutton 2	VI	VI	677
205	Pr1	Perry 1	VI	VI	3176	155	Cw1/3	Caswell 1/3	VI	VI	194
53	Lp2	Lonepine 2	VI	VI	2914	491	Eg8	Evergreen 8	VI	VI	771
202	Ab4	Aranbanga 4	VI	VI	201	500	Cw3	Caswell 3	VI	VI	9899
200	Ct1	Curtis 1	VI	VI	3837	499	Cw3	Caswell 3	VI	VI	3389
521	Rp1	Raspberry 1	VI	VI	1146	497	Ht2	Hutton 2	VI	VI	237
8	Td	Torsdale	VI	VI	1017	492	Eg8	Evergreen 8	VI	VI	1436
56	Cw3	Caswell 3	VI	VI	438	151	Ht2	Hutton 2	VI	VI	1744
327	Nr	Nour	VI	VI	947	80	Lp2	Lonepine 2	VI	VI	962
193	Gn2	Goodnight 2	VI	VI	1955	386	Cv	Crystalvale	VI	VI	2773
329	Ct1	Curtis 1	VI	VI	195	392	Wf1	Wingfield 1	VI	VI	7560
330	Ct1	Curtis 1	VI	VI	1502	390	Cv	Crystalvale	VI	VI	3960
209	Pr1	Perry 1	VI	VI	2530	156	Cw3	Caswell 3	VI	VI	11819
296	Ht2	Hutton 2	VI	VI	1918	345	Cw3	Caswell 3	VI	VI	4060
105	Td	Torsdale	VI	VI	195	261	Wf1	Wingfield 1	VI	VI	78832
45	Lp2	Lonepine 2	VI	VI	546	186	Ct1	Curtis 1	VI	VI	67
103	Cc1	Clonclose 1	VI	VI	2913	185	Mg	Mingo	VI	VI	2176
212	Ab4	Aranbanga 4	VI	VI	9677	184	Ct1	Curtis 1	VI	VI	38
50	Na	Narayen	VI	VI	67	58	Lb	Lochabar	VI	VI	615
38	Lp2	Lonepine 2	VI	VI	2199	101	Cc1	Clonclose 1	VI	VI	219
227	Ht2	Hutton 2	VI	VI	1511	182	Mg	Mingo	VI	VI	650
51	Ch	Cheltenham	VI	VI	6013	181	Ct1	Curtis 1	VI	VI	265
108	Td	Torsdale	VI	VI	3529	180	Ct1	Curtis 1	VI	VI	163
295	Ht2	Hutton 2	VI	VI	723	418	Cw3	Caswell 3	VI	VI	1152
309	Cw3	Caswell 3	VI	VI	908	447	Ht2	Hutton 2	VI	VI	2537
21	Cc1	Clonclose 1	VI	VI	5228	285	Ht2	Hutton 2	VI	VI	1605
1	Td	Torsdale	VI	VI	2501	99	Cc1	Clonclose 1	VI	VI	659
434	Cw3	Caswell 3	VI	VI	4224	163	Cw3	Caswell 3	VI	VI	56
262	Cg	Culcraigie	VI	VI	1470	465	Wf1	Wingfield 1	VI	VI	3931
546	Wf1	Wingfield 1	VI	VI	2747	519	Rp1	Raspberry1	VI	VI	618
446	Ht2	Hutton 2	VI	VI	1287	462	Wf1	Wingfield1	VI	VI	8861
444	Ht2	Hutton 2	VI	VI	246	174	Mg	Mingo	VI	VI	672
306	Cw3	Caswell 3	VI	VI	2838	112	Td	Torsdale	VI	VI	96
536	Wf1	Wingfield 1	VI	VI	63	349	Cw3	Caswell 3	VI	VI	7492
375	Ht2	Hutton 2	VI	VI	4060	489	Eg1	Evergreen 1	VI	VI	165
190	Gn2	Goodnight 2	VI	VI	469	415	Cw1/3	Caswell 1/3	VI	VI	887
480	Wf1	Wingfield 1	VI	VI	178	25	Cc2	Clonclose 2	VI	VII	755
482	Wf1	Wingfield 1	VI	VI	1180	18	Cc2	Clonclose 2	VI	VII	477
365	Ht2	Hutton 2	VI	VI	245	11	Cc2	Clonclose 2	VI	VII	1949
366	Ht2	Hutton 2	VI	VI	787	6	Cc2	Clonclose 2	VI	VII	6732
367	Ht2	Hutton 2	VI	VI	403	244	Lp2	Lonepine 2	VI	VII	9525
368	Ht2	Hutton 2	VI	VI	1911	7	Lp2	Lonepine 2	VI	VII	2323
483	Wf1	Wingfield 1	VI	VI	36	86	Lp2	Lonepine 2	VI	VII	383
122	Cg	Culcraigie	VI	VI	20092	93	Cc2	Clonclose 2	VI	VII	12755
505	Lb	Lochabar	VI	VI	125	123	Lp2	Lonepine 2	VI	VII	7644

* D – Dominant
\+ S - Subdominant

Appendix IV (continued)

UMA number	Code	Land System	Land Capability		Area (ha)	UMA number	Code	Land System	Land Capability		Area (ha)
			D*	S+					D*	S+	
166	Ba2	Bania 2	VI	VII	4077	439	Yb	Youlambie	VII	VI	473
172	Ba2	Bania 2	VI	VII	13140	348	Cw4	Caswell 4	VII	VI	12534
57	Cw3\4	Caswell 3\4	VI	VII	1630	450	Eg10	Evergreen 10	VII	VI	1709
188	Gn3	Goodnight 3	VI	VII	2412	442	Yb	Youlambie	VII	VI	3475
198	Br2	Briggs 2	VI	VII	529	120	Rb	Rawbelle	VII	VI	10445
192	Gn1	Goodnight 1	VI	VII	516	72	Eg10	Evergreen 10	VII	VI	198
241	Lp2	Lonepine 2	VI	VII	2254	496	Hm4	Hindmarsh 4	VII	VI	2567
196	Gn4	Goodnight 4	VI	VII	1844	116	Rb	Rawbelle	VII	VI	508
54	Cc2	Clonclose 2	VI	VII	3936	169	Ab2	Aranbanga 2	VII	VI	2156
109	Cc2	Clonclose 2	VI	VII	1288	525	Hm4	Hindmarsh 4	VII	VI	207
52	Cc2	Clonclose 2	VI	VII	1181	63	Eg10	Evergreen 10	VII	VI	89
106	Cc2	Clonclose 2	VI	VII	6083	435	Hm4	Hindmarsh 4	VII	VI	202
49	Lp2	Lonepine 2	VI	VII	1244	60	Eg10	Evergreen 10	VII	VI	4082
234	Ea	Eagle	VI	VII	7279	413	Hm4	Hindmarsh 4	VII	VI	247
111	Cc2	Clonclose 2	VI	VII	15254	430	Cw4	Caswell 4	VII	VI	9989
400	Hd	Hurdle	VI	VII	1145	177	Ab3	Aranbanga 3	VII	VI	1177
388	Cc2	Clonclose 2	VI	VII	1177	511	Hm4	Hindmarsh 4	VII	VI	79
337	Wb	Wonbah	VI	VII	73	494	Yb	Youlambie	VII	VI	2230
381	Cc2	Clonclose 2	VI	VII	1016	140	Eg10	Evergreen 10	VII	VI	5045
394	Cc2	Clonclose 2	VI	VII	3101	135	Rb	Rawbelle	VII	VI	6001
283	Ht3	Hutton 3	VI	VII	3436	94	Rb	Rawbelle	VII	VI	7585
498	Cw3/5	Caswell 3/5	VI	VII	1454	373	Eg10	Evergreen 10	VII	VI	1309
486	Mc3	Muncon 3	VI	VII	81	369	Eg10	Evergreen 10	VII	VI	693
502	Cw5	Caswell 5	VI	VII	2284	171	Ab3	Aranbanga 3	VII	VI	1833
358	Ht3	Hutton 3	VI	VII	342	504	Hm4	Hindmarsh 4	VII	VI	90
485	Mc3	Muncon 3	VI	VII	85	170	Ab3	Aranbanga 3	VII	VI	342
456	Mc3	Muncon 3	VI	VII	120	75	Eg10	Evergreen 10	VII	VI	2297
552	Cw5	Caswell 5	VI	VII	8610	451	Eg10	Evergreen 10	VII	VI	619
342	Ba2/1	Bania 2/1	VI	VII	1214	165	Ab2	Aranbanga 2	VII	VI	1344
323	Ba2	Bania 2	VI	VII	52874	73	Eg10	Evergreen 10	VII	VI	1228
533	Kb/Cw3	Kariboe/Caswell 3	VI	VII	3107	168	Ab3	Aranbanga 3	VII	VI	113
338	Br2	Briggs 2	VI	VII	1931	82	Cb	Coonambula	VII	VI	16069
421	Cw5	Caswell 5	VI	VII	1292	97	Rb	Rawbelle	VII	VI	161
559	Cw5	Caswell5	VI	VII	1917	555	Hm4	Hindmarsh 4	VII	VI	99
263	Lp2	Lonepine2	VI	VII	47	545	Hm4	Hindmarsh 4	VII	VI	61
264	Lp2	Lonepine2	VI	VII	84	544	Hm4	Hindmarsh 4	VII	VI	28
357	Ht3	Hutton3	VI	VII	309	59	Eg10	Evergreen 10	VII	VI	130
429	Cw5	Caswell5	VI	VII	2492	232	Eg10	Evergreen 10	VII	VI	1506
383	Cc2	Clonclose2	VI	VII	1466	543	Hm4	Hindmarsh 4	VII	VI	59
328	Wb	Wonbah	VI	VII	2388	526	Hm4	Hindmarsh 4	VII	VI	45
405	Ht3	Hutton3	VI	VII	9615	280	Eg10	Evergreen 10	VII	VI	682
404	Hd	Hurdle	VI	VII	1137	208	Wc	Wolca	VII	VI	11091
403	Ht3	Hutton3	VI	VII	1055	242	Rb	Rawbelle	VII	VI	4963
534	Cw5	Caswell5	VI	VII	537	19	Rb	Rawbelle	VII	VI	2579
537	Pp	Precipice	VI	VII	965	276	Eg10	Evergreen 10	VII	VI	473
335	Wb	Wonbah	VI	VII	137	554	Hm4	Hindmarsh 4	VII	VI	123
551	Mn2	Monal 2	VI	VIII	4266	210	Ab3	Aranbanga 3	VII	VI	4037

* D – Dominant
\+ S - Subdominant

Appendix IV (continued)

UMA number	Code	Land System	Land Capability		Area (ha)	UMA number	Code	Land System	Land Capability		Area (ha)
			D*	S+					D*	S+	
292	Eg10	Evergreen 10	VII	VI	1882	81	Cc2	Clonclose 2	VII	VII	126
293	Eg10	Evergreen 10	VII	VI	147	83	Cc2	Clonclose 2	VII	VII	28
334	Ab2	Aranbanga 2	VII	VI	221	85	Cc2	Clonclose 2	VII	VII	140
528	Hm4	Hindmarsh 4	VII	VI	629	29	Cc2	Clonclose 2	VII	VII	31
531	Hm4	Hindmarsh 4	VII	VI	22	87	Cc2	Clonclose 2	VII	VII	43
542	Hm4	Hindmarsh 4	VII	VI	167	88	Cc2	Clonclose 2	VII	VII	76
532	Yb	Youlambie	VII	VI	471	89	Cc2	Clonclose 2	VII	VII	70
326	Gt	Gaeta	VII	VI	1310	42	Cc2	Clonclose 2	VII	VII	155
265	Rb	Rawbelle	VII	VI	6231	240	Cc2	Clonclose 2	VII	VII	143
195	Gn5	Goodnight 5	VII	VI	4060	352	Cc2	Clonclose 2	VII	VII	332
539	Yb	Youlambie	VII	VI	1253	281	Cc2	Clonclose 2	VII	VII	178
201	Ab2	Aranbanga 2	VII	VI	43	278	Cc2	Clonclose 2	VII	VII	213
27	Cc2	Clonclose 2	VII	VII	19	235	Cc2	Clonclose 2	VII	VII	48
28	Cc2	Clonclose 2	VII	VII	19	236	Cc2	Clonclose 2	VII	VII	47
26	Cc2	Clonclose 2	VII	VII	26	124	Cc2	Clonclose 2	VII	VII	88
470	Cc2	Clonclose 2	VII	VII	298	239	Cc2	Clonclose 2	VII	VII	36
95	Cc2	Clonclose 2	VII	VII	43	225	Cc2	Clonclose 2	VII	VII	451
454	Pp	Precipice	VII	VII	147	273	Cc2	Clonclose 2	VII	VII	167
24	Cc2	Clonclose 2	VII	VII	54	272	Cc2	Clonclose 2	VII	VII	165
23	Cc2	Clonclose 2	VII	VII	123	270	Cc2	Clonclose 2	VII	VII	322
22	Cc2	Clonclose 2	VII	VII	26	269	Cc2	Clonclose 2	VII	VII	463
92	Cc2	Clonclose 2	VII	VII	601	218	Cc2	Clonclose 2	VII	VII	1459
20	Cc2	Clonclose 2	VII	VII	48	266	Cc2	Clonclose 2	VII	VII	164
30	Cc2	Clonclose 2	VII	VII	13	237	Cc2	Clonclose 2	VII	VII	236
556	Mc3	Muncon 3	VII	VII	989	319	Cc2	Clonclose 2	VII	VII	166
10	Cc2	Clonclose 2	VII	VII	70	314	Cc2	Clonclose 2	VII	VII	874
3	Cc2	Clonclose 2	VII	VII	90	216	Cc2	Clonclose 2	VII	VII	843
96	Cc2	Clonclose 2	VII	VII	163	316	Cc2	Clonclose 2	VII	VII	409
553	Mc3	Muncon 3	VII	VII	54	214	Cc2	Clonclose 2	VII	VII	39
40	Cc2	Clonclose 2	VII	VII	70	317	Cc2	Clonclose 2	VII	VII	56
126	Cc2	Clonclose 2	VII	VII	556	282	Cc2	Clonclose 2	VII	VII	1800
67	Cc2	Clonclose 2	VII	VII	94	318	Cc2	Clonclose 2	VII	VII	80
68	Cc2	Clonclose 2	VII	VII	36	351	Cc2	Clonclose 2	VII	VII	92
518	Mc3	Muncon 3	VII	VII	4166	312	Cc2	Clonclose 2	VII	VII	28
48	Cc2	Clonclose 2	VII	VII	42	311	Cc2	Clonclose 2	VII	VII	54
47	Cc2	Clonclose 2	VII	VII	264	321	Cc2	Clonclose 2	VII	VII	145
46	Cc2	Clonclose 2	VII	VII	63	310	Cc2	Clonclose 2	VII	VII	117
44	Cc2	Clonclose 2	VII	VII	170	222	Cc2	Clonclose 2	VII	VII	145
74	Cc2	Clonclose 2	VII	VII	1231	307	Cc2	Clonclose 2	VII	VII	980
43	Cc2	Clonclose 2	VII	VII	77	211	Cc2	Clonclose 2	VII	VII	528
84	Cc2	Clonclose 2	VII	VII	53	259	Cc2	Clonclose 2	VII	VII	52
36	Cc2	Clonclose 2	VII	VII	20	141	Cc2	Clonclose 2	VII	VII	74
90	Cc2	Clonclose 2	VII	VII	48	267	Cc2	Clonclose 2	VII	VII	325
39	Cc2	Clonclose 2	VII	VII	52	260	Cc2	Clonclose 2	VII	VII	358
33	Cc2	Clonclose 2	VII	VII	26	134	Cc2	Clonclose 2	VII	VII	98
32	Cc2	Clonclose 2	VII	VII	21	131	Cc2	Clonclose 2	VII	VII	192
31	Cc2	Clonclose 2	VII	VII	9	130	Bg	Boolgal	VII	VII	5219

* D – Dominant
\+ S - Subdominant

Appendix IV (continued)

UMA number	Code	Land System	Land Capability		Area (ha)	UMA number	Code	Land System	Land Capability		Area (ha)
			D*	S+					D*	S+	
162	Cc2	Clonclose 2	VII	VII	171	175	Ab5	Aranbanga 5	VII	VII	1802
128	Cc2	Clonclose 2	VII	VII	100	514	Mc3	Muncon 3	VII	VIII	572
142	Cc2	Clonclose 2	VII	VII	28	336	Ab5	Aranbanga 5	VII	VIII	164
127	Cc2	Clonclose 2	VII	VII	346	173	Hb	Hogback	VII	VIII	1777
257	Cc2	Clonclose 2	VII	VII	1418	178	Ab5	Aranbanga 5	VII	VIII	517
125	Cc2	Clonclose 2	VII	VII	109	378	Pp	Precipice	VII	VIII	853
284	Cc2	Clonclose 2	VII	VII	167	522	Pp	Precipice	VII	VIII	187
121	Cc2	Clonclose 2	VII	VII	221	197	Hb	Hogback	VII	VIII	11881
258	Cc2	Clonclose 2	VII	VII	51	397	Pp	Precipice	VII	VIII	84
113	Cc2	Clonclose 2	VII	VII	2304	540	Hd	Hurdle	VII	VIII	2132
129	Cc2	Clonclose 2	VII	VII	64	203	Ab5	Aranbanga 5	VII	VIII	11902
382	Cc2	Clonclose 2	VII	VII	76	457	Pp	Precipice	VII	VIII	9087
144	Cc2	Clonclose 2	VII	VII	712	376	Pp	Precipice	VII	VIII	7392
391	Cc2	Clonclose 2	VII	VII	371	138	Ev	Eidsvold	VIII	VI	4014
161	Cc2	Clonclose 2	VII	VII	379	512	Ba1	Bania 1	VIII	VI	281
146	Cc2	Clonclose 2	VII	VII	330	346	Ba1	Bania 1	VIII	VI	132
147	Cc2	Clonclose 2	VII	VII	313	529	Og2	Owlgully 2	VIII	VI	2631
148	Cc2	Clonclose 2	VII	VII	88	320	Ba1	Bania 1	VIII	VI	1663
149	Cc2	Clonclose 2	VII	VII	154	322	Ba1	Bania 1	VIII	VI	154
143	Cc2	Clonclose 2	VII	VII	450	324	Ba1/2	Bania 1/2	VIII	VI	869
160	Cc2	Clonclose 2	VII	VII	224	426	Ba1	Bania 1	VIII	VI	219
139	Cc2	Clonclose 2	VII	VII	650	344	Ba1/2	Bania 1/2	VIII	VI	360
332	Ab5	Aranbanga 5	VII	VIII	1954	340	Ba1	Bania 1	VIII	VI	429
9	Bg	Boolgal	VII	VIII	1907	527	Og2	Owlgully 2	VIII	VI	324
12	Bg	Boolgal	VII	VIII	453	341	Ba1	Bania 1	VIII	VI	3742
13	Bg	Boolgal	VII	VIII	141	343	Ba1	Bania 1	VIII	VI	178
14	Bg	Boolgal	VII	VIII	94	520	Rp2	Raspberry 2	VIII	VII	1429
549	Mc3	Muncon 3	VII	VIII	7613	206	Pr2	Perry 2	VIII	VII	2837
557	Pp	Precipice	VII	VIII	3745	560	Cn	Cannindah	VIII	VII	633
5	Bg	Boolgal	VII	VIII	617	331	Ct2	Curtis 2	VIII	VII	1406
558	Mc3	Muncon 3	VII	VIII	36	410	Cn	Cannindah	VIII	VII	276
15	Bg	Boolgal	VII	VIII	135	488	Hd	Hurdle	VIII	VIII	660
191	Wg2	Wateranga 2	VII	VIII	301	333	Ab1	Aranbanga 1	VIII	VIII	1143

* D – Dominant
\+ S - Subdominant