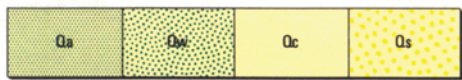


REFERENCE

CAINOZOIC  
TERTIARY  
QUATERNARY

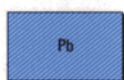


Qa Alluvium—unconsolidated silt, sand and gravel associated with watercourses  
 Qw Alluvium—unconsolidated silt and sand in sheet-wash and piedmont plains overlying Tertiary hardpan surfaces, often with banks of windblown sand  
 Qc Colluvium—unconsolidated silt, sand, gravel and rubble forming scree or talus slopes  
 Qs Eolian and residual sand

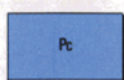


**Czn NADARRA FORMATION** : lacustrine limestone, includes minor calcrite  
 Czc Hardpan—consolidated and semi-consolidated colluvium and alluvium, silt, sand, gravel and rubble, commonly dissected  
 Czk Calcrite and kankar, in part replaced by opaline silica  
 Czl Laterite and ferruginous deposits  
 Czb Silcrete and intensely silicified sandstone  
 Czd Chalcedonic capping on dolomite

PALAEZOIC  
LATE CARBONIFEROUS  
PERMIAN  
ARTINSKIAN  
SAKMARIAN  
Wooramel Group



**Pb BILLIDEE FORMATION** : quartz sandstone and siltstone commonly with calcareous cement, rare glacial erratics; shallow marine  
**Pm MOOGOOLOO SANDSTONE** : quartz sandstone and siltstone minor conglomerate, rare glacial erratics; fluvial to shallow marine



**Pc CALLYTHARRA FORMATION** : hard and soft fossiliferous calcarenite, calcisiltite and siltstone; shallow marine  
**Cpl LYONS FORMATION** : glaciogene sandstone, siltstone and tillite, rare varves; continental to marine  
**Cla Austin Member** : quartz sandstone to feldspathic arenite; ? shallow marine basal member of Lyons Formation



b : Dolerite sill; d : dolerite dyke (may be weakly altered) (age variable)  
 q : Quartz vein; qf : vuggy quartz vein may contain fluorite (age variable)

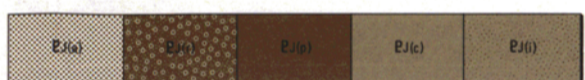
MIDDLE PROTEROZOIC  
Bangemall Group



**EMs FORDS CREEK SHALE** : green to dark grey shale, minor arenite and siltstone  
**EMw COODARDOO FORMATION** : moderate to poorly sorted grey arenite, with minor siltstone and shale towards base  
**EMu CURRAN FORMATION** : white shale, siliceous in outcrop  
**EMl ULLAWARRA FORMATION** : fine-grained, maroon or grey arenite with siltstone shale, minor dolomite  
**EMv DEVIL CREEK FORMATION** : dolomite, dolomitic shale  
**EMd DISCOVERY CHERT** : bedded, black to cream chert, may be wavy bedded, and laminated  
**EMj JILLAWARRA FORMATION** : shale and siltstone with minor chert  
**EMk KIANGI CREEK FORMATION** : medium-grained arenite with shale, coarse-grained arenite beds and pebble beds  
**EMk(d) Dolomite unit**  
**EMi IRREGULLY FORMATION** : dolomite, with shale and minor arenite, stromatolites present  
**EMi(s) Shale unit**  
**EMa MT AUGUSTUS SANDSTONE** : coarse-grained quartz arenite, minor conglomerate



EM(a) Sandstone  
 EM(s) Shale  
 EM(r) Conglomerate  
 EM(d) Dolomite  
 EM(c) Chert



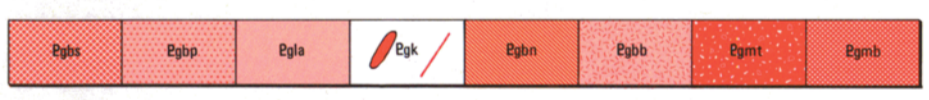
**EJ(a) MOUNT JAMES FORMATION**  
 EJ(a) Metamorphosed, foliated quartz arenite, with thin metaconglomerate lenses in some areas  
 EJ(r) Metaconglomerate, polymictic  
 EJ(p) Phyllite  
 EJ(c) Metamorphosed chert and cherty, graphitic shale commonly ferruginous, contains grunerite and garnet  
 EJ(i) Interbedded micaceous metasandstone and metasilstone, commonly garnetiferous



Edm Metadolerite or metagabbro, dyke or sill (age uncertain)  
 Eu Tremolite (-chlorite) rock, ultramafic dyke (age uncertain)  
 pv Pegmatite dyke with tourmaline and beryl (age uncertain)



**Egbr** Biotite granodiorite and adamellite; even-grained and seriate, coarse, medium and fine-grained. Some phases are leucocratic granite  
**Egbm** Biotite-muscovite adamellite and granite; medium-grained with some coarse and fine-grained phases  
**Egvl** Biotite-tourmaline-muscovite granite and adamellite; porphyritic and seriate, coarse to fine-grained  
**Egvm** Muscovite-tourmaline adamellite granite and pegmatite  
**Egve** Biotite-muscovite (-tourmaline) -adamellite and granite, fine-grained, foliated  
**Egib** Biotite (-muscovite) granodiorite and adamellite; porphyritic and even-grained, coarse and fine-grained, foliated  
**Egbt** Biotite granodiorite; medium-grained, foliated



**Egbs** Dark grey, gneissic, biotite granodiorite; medium and fine-grained  
**Egbp** Pink, gneissic, biotite (-muscovite) adamellite; medium-grained  
**Egla** Gneissic biotite granite to granodiorite with microcline augen and laths; coarse to medium-grained  
**Egk** Oligoclase-clinopyroxene (-quartz-sphene-allanite) gneiss; alkaline anorthosite  
**Egbn** Migmatite and nebulous granitoid with a dark-phase of adamellite or granodiorite gneiss and a light-phase of leucocratic granite; partially melted Egla or Egbs  
**Egbb** Gneissic biotite granodiorite partially melted and extensively intruded by biotite-muscovite adamellite and pegmatite; agmatitic in part  
**Egmt** Biotite-muscovite (-garnet) tonalite to adamellite; heterogeneous with numerous xenoliths and biotite schlieren  
**Egmb** Gneissic biotite-muscovite adamellite and granite; porphyritic in part. Some phases are tourmaline leuco-granite



**Elm** Quartz-muscovite-biotite (-sericite-chlorite-andalusite-garnet-tourmaline) schist, includes prograde and retrograde assemblages  
**Elg** Quartz-biotite-muscovite-garnet (-staurolite-andalusite-chlorite-sillimanite-cordierite) schist  
**Elp** Sericite-chlorite-quartz-magnetite phyllite and fine-grained schist  
**Elo** Sericitized and chloritized muscovite, quartz andalusite (-biotite chloritoid-staurolite-?cordierite) granofels  
**Elc** Chlorite-amphibole-calcite-dolomite (-quartz) granofels and schist  
**Eqm** Foliated quartzite and micaceous quartzite  
**Elq** Fine-grained, banded quartzite, recrystallized chert; ferruginous in part



**Enb** Quartz-microcline-oligoclase-biotite-muscovite paragneiss and schist; medium to coarse-grained; metamorphosed arkose and feldspathic arenite  
**Enl** Quartz-biotite-muscovite-feldspar (-garnet) schist and paragneiss  
**Enp** Quartz-feldspar-biotite-muscovite microgneiss and schist; metamorphosed greywacke  
**Enr** Quartz-feldspar-biotite microgneiss with polymictic conglomerate  
**Enc** Actinolite-tremolite-quartz-feldspar-clinopyroxene-epidote-sphene compositionally layered assemblages; calc-silicate gneiss and granofels  
**Enm** Calcite and/or dolomite-tremolite-actinolite (-chlorite-humite-quartz) marble  
**Ena** Hornblende-plagioclase (-garnet-actinolite-clinopyroxene) amphibolite; fine and medium-grained



**Emb** Migmatite with a dark-phase of paragneiss, schist, biotite schlieren, and minor calc-silicate gneiss and amphibolite; and a light-phase of biotite (-muscovite tourmaline) granitoid and pegmatite  
**Emm** Migmatite with a dark-phase of schist, muscovite, biotite schlieren, and minor paragneiss; and a light-phase of muscovite (-biotite tourmaline) adamellite, granite and pegmatite

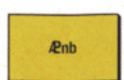
EARLY PROTEROZOIC

Morrissey Metamorphic Suite

Late Stage Granitoids  
Early Stage Gneissic Granitoids

ARCHAEOAN

Older Gneissic Terrain



**Aeb** Banded quartz-microcline-oligoclase-biotite gneiss; reworked Archaean gneiss