

PERMANENT	PALEOCENE - NEOGENE	CENOZOIC	QUATERNARY	HOLOCENE	
				Qhm	Undifferentiated Cenozoic sediments (TQ). Undifferentiated Quaternary sediments (Q). Man-made deposits (Qmm).
				Qhls	Landslip and debris flow deposits (Qhls).
				Qha	Stream alluvium, swamp and marsh deposits (Qha).
				Qham	Alluvial, and swamp deposits of gravel, sand, silt and clay, commonly with organic-rich top layer (Qham). Alluvial gravel deposits (Qhag).
				Qhiv	Estuarine deposits of clayey silt, silt, sand and mostly buried gravel. In generalised tidal to shallow water sub-tidal undifferentiated environments (Qhiv). In upper tidal to low supra-tidal, inferred generally saline marsh environments (Qhiv). In low supra-tidal commonly seaward adjoining, inferred brackish marsh environments (Qhiv). Estuarine and other deposits including supra-estuarine sways and lateral alluvial deposits, unimpacted man-made land and fill deposits from river dredging at places, in environments inferred to lie above common tidal influence (Qhiv). Undifferentiated estuarine deposits of clayey silt, silt, sand and subordinate gravel, grading upstream into alluvium with less clay and silt (Qhiv).
				Qhc	Colluvial deposits of gravel, sand and clay (Qhc), clayey gravel derived from dolerite (Qhcd): with dolerite clasts derived from Palaeogene - Neogene dolerite conglomerate (Qhcc): with siliceous clasts derived from Cenozoic deposits (Qhcs).
				Qa	Alluvial gravel, sand and clay (Qa).
				Qaf	Alluvial fan deposits predominantly of dolerite clasts (Qaf).
				Qn	Plagioclite ironstone gravel, cemented in places, of lag, alluvial and colluvial origin (Qn).
				Qls	Lag deposit of quartz sandstone and pebbly sandstone, possibly derived from Palaeogene - Neogene sandstone (Qls).
				Qpad	Alluvial terrace deposits predominantly composed of dolerite cobbles (Qpad).
				Qban	Terrace deposit of major estuary or stream with siliceous clast gravel below present sea level, micaceous sand, silt and mud, and of probable Pleistocene age (Qban).
				Qpds	Probable Pleistocene low-gradient alluvial fan and/or alluvial terrace, clasts dominantly dolerite and siliceous rock, situated about 5-10m above neighbouring stream valleys cut in bedrock (Qpds).
				Qpt	Talus (Qpt): talus composed predominantly of Jurassic dolerite (Qpdt): of Palaeogene - Neogene basalt (Qpbt): of ferritic fragments (Qpft).

PERMANENT	PALEOCENE - NEOGENE	CENOZOIC	JURASSIC	
			TQae	Undifferentiated Cenozoic sediments (TQ). Late Cenozoic terrace deposits of uncertain composition, generally <5m, extending to approximately 15m above sea or river level, with gravel layers above present sea level (TQae).
			TQaa	Late Cenozoic terrace deposits of siliceous pebble gravel and sand cemented by iron oxides in places, 5-10m above sea level, local to poorly consolidated, clast composition poorly known, dominantly siliceous in some areas of probable Pleistocene age (TQaa).
			TQab	Late Cenozoic terrace deposits of siliceous pebble gravel and sand cemented by iron oxides in places, ~20m above sea level or local base level, of probable Pleistocene age (TQab).
			TQac	Late Cenozoic terrace deposits of siliceous pebble gravel and sand with rare boulder-sized clasts, cemented by iron oxides in places, ~20m above sea level or local base level (TQac).
			TQag	Late Cenozoic terrace deposits of siliceous pebble gravel and sand with rare boulder-sized clasts, cemented by iron oxides in places, ~20m above sea level (TQag).
			Ti	Ferritic, laterite and basaltite with cemented and soft layers (Ti). Laterite profile, basaltite or other ferritic inferred from limited outcrop of loose ferritic fragments (Ti). Lower remains of laterite profile grading down to very weathered rock, lacks siliceous and generally lacks substantial occurrences of ferrite; commonly developed over dolerite (Ti).
			Tb	Basalt (Tb): inferred basalt beneath soil or Cenozoic deposits (Tbi); quartz tholeiite (Tbt); limburgite (Tbt).
			Ts	Undifferentiated Palaeogene - Neogene sediments, non-marine sequences of gravel, sand, silt, clay and siltstone (Ts).
			Tcdm	Moderately consolidated, dominantly cobble grade with lesser pebble and boulder grade dolerite conglomerate, some sandstone and rare siltstone; common zeolite and calcite cements (Tcdm); with rare horizons of mid-Palaeogene - Neogene leaf fossils (Tcdm).
			Tca	Partly consolidated clay, silt, and clayey silt sand with rare gravel and lignite; some iron oxide-cemented layers and concretions; some leaf fossils (Tca); poorly consolidated quartz-rich micaceous sandstone and conglomerate interbedded with siltstone and mudstone, commonly with some ferruginous and rarely siliceous cement (Tca); underlying Palaeogene - Neogene basalt at Abels Hill (Tca).
			Tca	Tot unit dominantly of pebble and cobble conglomerate and sandstone forming marker unit at Abels Hill, of Eocene age and overlain by beds containing <i>Notoflagellates</i> <i>supra</i> <i>Zona</i> <i>polytrifera</i> (Tca).
			Tca	Brown-grey plastic clay, minor silt, clayey sand and ironstone at South Launceston (Tca).
			Tba	Basaltite profile developed on pre-Palaeogene rocks and overlain by Palaeogene rocks (Tba).
			Rcs	Cross-bedded quartz sandstone, feldspathic sandstone and shale (Rcs).
			Pct	Carbonaceous sandstone and shale (Clog Tom Sandstone) (Pct).
			Pubg	Unfossiliferous pebbly siltstone, siltstone and sandstone (Bogan Gap Group) (Pubg).

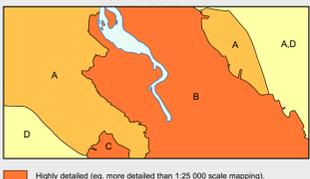
INTRUSIVE ROCKS	
Jd	Dolerite (Jd). Dolerite of grain size 0.7-1.5mm (Jdf); 1.5-3mm (Jdm); 3-6mm (Jdb); inferred dolerite beneath soil or Cenozoic deposits (Jdi).
Jdw	Predominantly deeply-weathered dolerite (Jdw).

CONTACTS	
—	Geological contact.
- - - - -	Geological contact - inferred.
- - - - -	Limit of mapping of sub-unit within undifferentiated rock unit.

FAULTS	
- - - - -	Fault.
- - - - -	Fault - inferred.
- - - - -	Fault - concealed.
- - - - -	Fault - concealed, inferred from magnetic data.
- - - - -	Normal fault (downthrown side indicated).
- - - - -	Normal fault (downthrown side indicated) - inferred.
- - - - -	Normal fault (downthrown side indicated) - concealed.

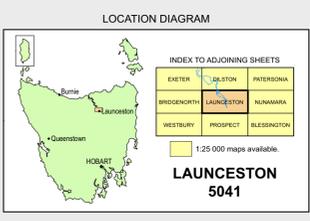
LINEARS	
- - - - -	Slope break.
- - - - -	Lineament - visible on aerial photographs.
- - - - -	Lineament - visible in magnetic data.
- - - - -	Magnetic gradient or lineament (direction towards lower values indicated).
- - - - -	Lithological trend line, including bedding trace interpreted from aerial photographs.

SYMBOLS	
↗	Strike and dip of bedding - right way up; vertical, facing indicated by single tic.
↖	Strike of outcrop-scale fault of unspecified type and relative age.
↗	Generalised paleoseismic direction, showing sense of movement.
↖	Strike and dip of dominant joint set - dipping; vertical.
↗	Trend of dyke or vein, rock type or mineral specified by RCODE in Point Attribute Table.
•	Notable small outcrop with rock unit indicated.
✕	Mineral deposit location - alluvial/tailing.
✕	Construction material/industrial mineral/gemstone location.



Compiled by S.M. Forsyth, B.Sc. and C.R. Calver, B.Sc.(Hons), Ph.D., 2005 from the following sources (see source diagram):
A. C.R. Calver, 1:25 000 mapping 2001-2003
B. FORSYTH, S.M. 1998, Geology map, Launceston area, Urban Engineering Geology Series, Tasmanian Geological Survey (recompiled 2005).
C. W.R. Moore, 1989, Slope stability and engineering geology of the Blackstone Heights area, Compilation report, Department of Mines unpublished report 189/89.
D. LONGMAN, M.J.; MATTHEWS, W.L.; POWE, S.M., 1963 Launceston 1:63 360 Geological Map, minor revision by C.R. Calver.

REFERENCE THIS MAP AS:
FORSYTH, S.M. and CALVER, C.R. (compilers) 2005, Digital Geological Atlas 1:25 000 Scale Series, Sheet 5041 Launceston, Mineral Resources Tasmania.
Base data from the LIST, Copyright State of Tasmania.
Map produced by Spatial Information Services, Mineral Resources Tasmania.
Website: www.mrt.tas.gov.au
GDMS - MGA Zone 55, Contour Interval: 20 metres.



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