Occurrences of Gemstone Minerals in Tasmania

Tasmania

DEPARTMENT *of* INFRASTRUCTURE, ENERGY *and* RESOURCES

Mineral Resources Tasmania

Occurrences of gemstone minerals in Tasmania (8th edition)

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Introduction

This book has been prepared as a guide for people who are interested in collecting and polishing Tasmanian gemstones and is an updated version of the seventh edition compiled by W. L. Matthews and R. S. Bottrill in 1993. The descriptions and localities of the various minerals have been compiled from a number of sources. These include: *Catalogue of the Minerals of Tasmania* by W. F. Petterd, 1910 (a revised edition was issued as *Geological Survey Record* 9, 1970); Lancaster (1980, 2000); *Gemstones in Tasmania* by P. B. Nye (1927); Tasmanian Museum and Art Gallery mineral catalogue; and Dr F. L. Sutherland, formerly of the Tasmanian Museum and Art Gallery. Staff of Mineral Resources Tasmania (formerly the Department of Mines), and the various lapidary clubs in Tasmania, have supplied some localities. In many cases where localities are taken from publications, the precise locality has not been given therein. Similarly the location map in this book only represents general geographic localities and should not be taken to be indicative of precise locations. The list of localities is by no means complete, and with more intense searching it can be expected that gemstones will also be found in other areas.

Many of the areas mentioned in this book are on private property or mining leases, and the permission of the owner or lessee should be obtained before a search is made. Some areas are in National Parks or Forest Reserves, where collecting may not proceed without the authority of the relevant land manager. Collectors must ascertain the actual land status of a particular locality and obtain permission from the relevant land management agency or owner **before** removing specimens. There are a number of designated fossicking areas in Tasmania, and fossicking outside of these areas without a prospecting licence is not permitted (see page 29).

The supply of information, samples and photographs by various people, including Ross Jones, Nigel Ellis, Steve Sorrell, Andrew Tuma, Ian Graham, Peter Manchester, Mike Adams, Christo Lees, Peter Harris, John Richmond, Boyd Sweeney, Mark Cochrane and Carol Bain, is gratefully acknowledged.

Further Reading

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List of Minerals

Although many kinds of gemstones have been reported in Tasmania, few specimens of the more precious varieties have been found. Varieties of crystalline and amorphous silica are by far the most abundant. In the following listing the physical properties of each mineral are presented as follows:

H = hardness (Moh's scale)
SG = specific gravity (g/cm^3)
CS = crystal system

AGATE see Quartz

AGATE, MOSS see Quartz

ALEXANDRITE see Chrysoberyl

ALMANDINE see Garnet

AMBER fossil resin;
H = 2–2.5; SG = 1.1 (not a mineral)

Historically, amber was probably one of the first gemstones in the world to be cut and it is still highly valued. Amber is generally a transparent to translucent yellow substance with a conchoidal fracture. It has been reportedly found at Rebecca Creek on the West Coast.

AMETHYST see Quartz

ANDRADITE see Garnet

ANDALUSITE aluminium silicate;
H = 7.5; SG = 3.2; CS = orthorhombic

Andalusite occurs as pink, brown or white prismatic crystals in some metamorphic and igneous rocks. Large crystals occur at Blue Tier and on King Island, and it occurs as small crystals and masses at many sites in Tasmania. The variety chiastolite shows a black cross in cross section. Chiastolite occurs near Zeehan. No gem quality andalusite is known from Tasmania.

APATITE see Fluorapatite

AQUAMARINE see Beryl

AXINITE see Ferroaxinite

AZURITE basic copper carbonate;
H = 3.5–4; SG = 3.8; CS = monoclinic

Azurite is sky blue in colour and in Tasmania the known occurrences are of thin scaly masses and small crystals, mostly unsuitable as gems. Areas where azurite is found include Cascade River, Dundas, Gads Hill, Hampshire, Heazlewood River, Mackintosh River, Mainwaring Inlet, Mt Lyell, Penguin, Saxons Creek, Scamander River, Smithton and Zeehan. No gem azurite is known in Tasmania.

BERYL beryllium aluminium silicate;
H = 7.5–8; SG = 2.6–2.8; CS = hexagonal

The varieties of beryl mainly used as gemstones are emerald (bright emerald green), aquamarine (pale blue to pale green) and heliodor (golden beryl). Colourless to bluish green crystals of beryl have been recorded from Flinders Island and Mt Cameron. Other areas are Bell Mount (pale green), Mt Bischoff (deep blue), Great Republic mine (Ben Lomond) (mottled yellow-brown), Lake Cethana (blue), Moina, and along the St Pauls River near Royal George (bright green crystals). Small specimens of emerald have been reported from Thureaus Deep Lead near St Helens and aquamarine in the Moina area. Tasmanian beryl has rarely been used for gems.

Beryl (aquamarine), Mt Bischoff [Photo: Ralph Botrill]

CAIRNGORM see Quartz

CASSITERITE tin oxide;
H = 6–7; SG = 6.8–7.1; CS = tetragonal

Most of the cassiterite occurring in Tasmania is black or brown but red, yellow and colourless crystals have been found. The coloured crystals have sometimes been large enough to cut as gems. Ruby tin (red cassiterite) occurs at Coles Bay, Flinders Island, Goshen, Mt Cameron, Pats River on Flinders Island, Rossarden, Ruby Flats near Branxholm, and Waratah.

CATS EYE see Chrysoberyl

CERUSSITE lead carbonate;
H = 3–3.5; SG = 6.5–6.6; CS = orthorhombic

This mineral is common in the oxidised zones of some lead deposits, and may occur in small gemmy crystals, usually colourless to white, brown or yellow in colour. It has a high lustre and dispersion, making an attractive faceted stone, but is relatively soft and brittle, so is mostly only of interest to collectors.

Good specimens were found in the mines at Dundas, particularly the Comet, Kapi, West Comet, Dundas Extended and Adelaide mines. Specimens of the mineral have also been recorded from the Silver Queen, Sylvester, Austral and other mines in the Zeehan field; from the Whyte River and Heazlewood silver-lead mines; and from the Magnet mine. Most of these mines produced spectacular specimens of a bright yellow variety commonly known as 'chrome cerussite', as well as the more common white variety.

CHALCEDONY see Quartz

CHERT see Quartz

CHIASTOLITE see Andalusite

CHRYSOBERYL beryllium aluminium oxide;
H = 8.5; SG = 3.5–3.8; CS = orthorhombic

A variety of chrysoberyl known as alexandrite is the best known gemstone of this mineral and is characterised by being emerald green in ordinary light and columbine-red in artificial light. It has been found in limited quantities at Weld River (northeast Tasmania). One stone of very good quality and several of poorer value have been reported. Pale green stones are sometimes called chrysolites but this term is usually applied to olivine. Good cuttable stones with chatoyancy (cymophane or Cats Eye) have been found in the Ringarooma River near Derby and near Moorina.

CHRYSOCOLLA hydrated copper silicate;
H = 2–4; SG = 2.0–2.4; CS = amorphous

A pale blue to green massive glassy material which has been recorded in small amounts around Back Creek, Colebrook Hill and Ringarooma.

CHRYSOLITE see Chrysoberyl, Olivine

CITRINE see Quartz

CLINOZOISITE see Epidote

COMMON OPAL see Opal

CORDIERITE Magnesium iron aluminium silicate;
H = 7–7.5; SG = 2.6–2.7; CS = orthorhombic

Also known as iolite in the gem trade. This mineral is moderately common in contact metamorphosed rocks in various parts of Tasmania, particularly the North East. It is usually dark blue, brown or black and glassy, but no gem quality material is known in Tasmania.

CORNELIAN see Quartz

CORNELIAN AGATE see Quartz

CORUNDUM aluminium oxide;
H = 9; SG = 4.0–4.1; CS = hexagonal

Corundum is the mineral of which both sapphire and ruby are varieties. In addition to the localities listed below, corundum occurs at Adamsfield. Most gem corundum is described as sapphire unless coloured red or black.

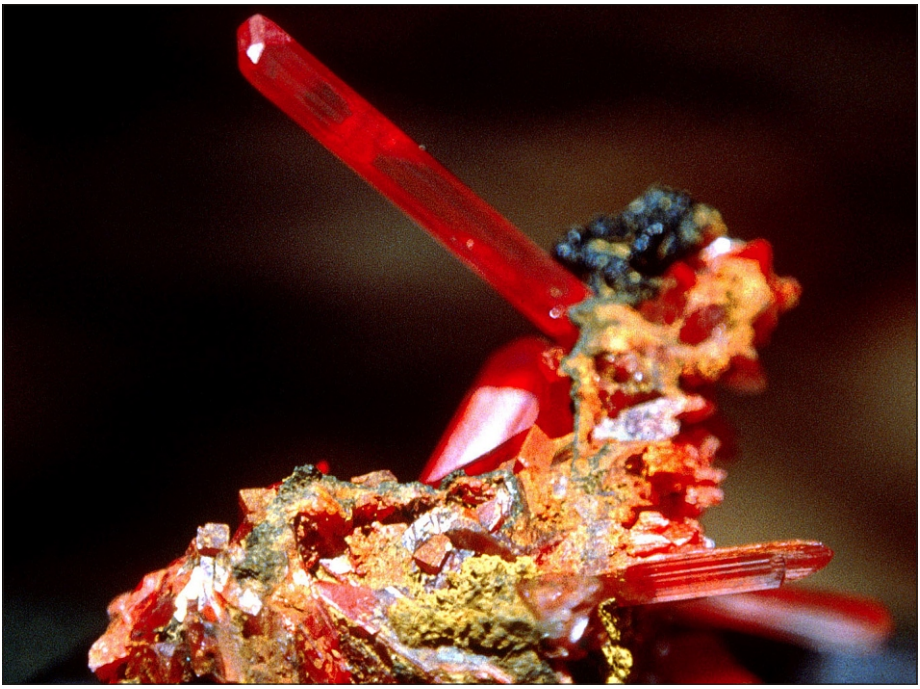
Sapphire: fairly widespread in alluvial tin areas of the North East but only occasional specimens are suitable to cut. They vary in colour from green (oriental emerald), blue, yellow (oriental topaz) and purple (oriental amethyst). Sometimes the stones are parti-coloured and some star sapphires have been found. Notable localities are Branxholm, Coles Bay, Derby, Gladstone, Lottah (some star sapphires), Main Creek, Moorina, Mt Cameron, Mt Stronach, and in the Weldborough–Weld River area. The largest sapphire recorded from Tasmania is a 52.8 g parti-coloured stone found in the Weld River area.

Other areas where sapphires have been found are Adamsfield, Blythe River, Boat Harbour–Sisters Creek (in sub-basalt gravel), Launceston, Lisle, Stanley River tinfield and Table Cape.

Ruby: the red chromian variety of corundum. This has been reported from tin workings of northeast Tasmania, although some may really be zircon or garnet.

CROCOITE lead chromate;
H = 2–3; SG = 5.9–6.; CS = monoclinic

This mineral occurs as attractive red crystals, usually kept as specimens but sometimes cut as non-durable gemstones. Crocoite was quite abundant at many old silver-lead mines on the West Coast, and is still being mined in places. Originally much was mined for use as a flux in the Zeehan smelters. The principal locations are the Heazlewood, Magnet and Whyte River mines near Waratah; the Red Lead, Adelaide, Dundas Extended, Kapi and West Comet mines at Dundas; and the Silver Queen mine at Zeehan. It is usually opaque but may be semi-transparent and gemmy.



Crocoite, Red Lead Mine, Dundas [Photo: Mike Adams]

DARWIN GLASS Silica-rich glass (not a mineral);
H ≈ 5, SG ≈ 2.4, CS = amorphous

This is an impact glass, resulting from a large meteorite or asteroid impact which formed a crater near Darwin, southeast of Queenstown. Darwin glass can be found as irregular, molten-looking fragments to a few centimetres, in a wide area mostly south of Queenstown. It is translucent to opaque, or rarely

transparent in small pieces, and of a black to pale green or brown colour. It has sometimes been used as a gem material.

DATOLITE calcium borosilicate
H = 5–5.5; SG = 2.9; CS = monoclinic

Datolite is usually colourless to pale yellow, green or blue, and is similar to topaz in lustre and appearance. It occurs at Colebrook Hill, near Rosebery, in pale green crystals to a few centimetres, with ferroaxinite, quartz and danburite.

DIAMOND carbon;
H = 10; SG = 3.5; CS = cubic

About 18 diamonds of small size (average mass 25 mg, some specimens up to 67 mg or 0.3 carat) have been found in gold-bearing alluvial deposits in a small tributary of the Pieman River and in Harveys Creek, a tributary of the Little Savage River. They occurred in good crystals with points tinged yellow. Reports that a small diamond was found in alluvial material in the Hellyer River and in peridotite at Gabbro Hill (formerly known as Bald Hill) are unconfirmed. 'Killiecrankie Diamonds' from Flinders Island are actually topaz. Some small diamonds have been found in the Corinna area in recent years.

DIOPSIDE

Calcium magnesium silicate;
H= 5–6; SG = 3.2–3.3; CS = Monoclinic

This pyroxene is a common component of many igneous and metamorphic rocks, but is seldom of gem interest. In the Weld River, near Glovers Bluff, a massive white skarn occurs in altered dolomite. This is locally composed of fine grained, almost pure diopside, usually with variable amounts of quartz, calcite and other minerals. When nearly pure it is exceptionally tough, and can be cut, carved and polished like a white jadeite, to which it is closely related.

EMERALD see Beryl

EPIDOTE hydrous silicate of calcium, iron and aluminium;
H = 6.7; SG = 3.25–3.5; CS = monoclinic

Epidote is usually yellowish green to greenish black but may be pink, brown and other colours. Most examples of the mineral in Tasmania are of small size. Areas where epidote is known to occur include *Calstock* south of Deloraine, Dundas, in the Emu River at St Valentines Peak, Forth River area, Grassy (King Island Scheelite mine), Lake Jukes, Magnet Range, Mainwaring Inlet area, Mt Bischoff area, Mt Claude (near the Round Mount silver-lead mine), the Smithton area, South Comstock, Table Cape, Tyndall Range, and Whyte River.

A pink clinozoisite ('thulite'), related to epidote, has been found at Andersons Creek near Beaconsfield and polishes well, but is usually labelled (incorrectly) rhodonite.

FALSE TOPAZ see Quartz

FELDSPAR (GROUP) potassium, sodium and calcium aluminium silicates;
H = 6; SG = 2.6; CS = triclinic and monoclinic

This group includes orthoclase, albite, anorthoclase, sanidine and several other species, mostly white or pale coloured. Feldspars are a major component of most igneous rocks, and where coarse grained or in large masses can be of gem quality or lapidary interest. Amazonite is a green potassic feldspar which occurs in small amounts in granite near Scottsdale. Gemmy, colourless anorthoclase (moonstone) occurs as crystals to a few centimetres in basalt near Boat Harbour, and has been cut as gems.

FERROAXINITE calcium iron aluminium borosilicate;
H = 6.5–7; SG = 3.3; CS = triclinic

Ferroaxinite is generally clove brown to purplish in colour and occurs as tabular crystals which are sometimes cut as gemstones. The Colebrook mine near Dundas is the best known locality but ferroaxinite has also been found at Mt Ramsay, Parsons Hood, and has been reported from Hampshire.

FLINT see Quartz

FLUORAPATITE calcium fluorophosphate;
H = 5; SG = 3.2; CS = hexagonal

Fluorapatite is usually green, blue-green or violet-blue but crystals of white, yellow, grey, red, pink, brown and other colours do occur. Fluorapatite has been reported as occurring in the volcanic rocks at Cape Portland, at Crystal Hill in the Blue Tier area, at the Hampshire Silver mine as green crystals in slate, at Mathinna in granodiorite, at Mt Bischoff in porphyry, at Sandy Bay in basanite, and at Shannon Tier in basalt, but no sizable crystals are known.

FLUORITE calcium fluoride;
H = 4; SG = 3.2; CS = cubic

Because of its low hardness, fluorite is only occasionally used as a gemstone. It shows great variety in colour but colourless, blue, green and purple crystals are the most common. It has been found at Babel Island, the Great Republic mine (Ben Lomond), Hampshire, Lottah, Luina, Moina, Mt Bischoff, Mt Ramsay, Rosebery, Zeehan and many other localities.

GAHNITE see Spinel

GARNET (Group) silicates of iron, calcium, magnesium, manganese, aluminium, titanium and chromium;
H = 6.5–7.5; SG = 3.3–4.3; CS = cubic

The major species of this group identified in Tasmania include almandine, andradite, grossular, spessartine and uvarovite. The colour of garnet varies, depending on composition, from dark brown and black to green, pink, yellow and colourless. When the colour is well developed and the crystals are free from flaws, they are considered to be low-value gems.

Garnet is common in metamorphic rocks and some alluvial deposits. Occurrences include Bell Mount, Comstock, Cygnet, Grassy on King Island (greenish yellow and brown), Hampshire (often greater than 25 mm in diameter), Heazlewood River, near Highwood Hill on the Emu River, Hudson and Lewis rivers, Maynes tin mine (south of Mt Heemskirk), Moina, Mt Claude, Mt Kerford (Cape Barren Island), Mt Ramsay, Mt Stormont, Sea Elephant, Stonyford (about 2 km west of St Helens — small and pink), Trial Harbour, Whyte River and from many of the Precambrian schists which occur in the western half of Tasmania. Jacinth is a name sometimes given to cinnamon-brown gem garnet but this name usually refers to brown zircon. Green-brown andradite garnet is abundant at the Kara mine near Hampshire but is rarely gemmy.

GROSSULAR see Garnet

HELIODOR see Beryl

HERCYNITE see Spinel

HORNFELS generally silica-rich rocks;
H ≈ 6–7.5; SG ≈ 2.5–2.7

A fine-grained, hard, baked rock usually formed by contact with a molten igneous rock. Some variably coloured siliceous hornfels from near St Valentines Peak and south of Hobart have been found to polish well and be of lapidary interest.

HORNSTONE see Chalcedony

HYACINTH see Zircon

JACINTH see Garnet, Zircon

Opalised wood, Plenty [Photo: Ralph Bottrill]

Petrified fern, Lune River [Photo: Ross Jones]

JARGOON see Zircon

JASPER see Quartz

KILLIECRANKIE DIAMOND see Topaz

MALACHITE basic copper carbonate;
H = 3.5–4; SG = 3.9–4.0; CS = monoclinic

Although malachite crystallises as needle-like crystals, it usually takes a banded, granular or earthy habit and is green in colour. In Tasmania malachite is commonly only found as a thin encrustation but occasional samples, large enough to polish, have been found. Malachite has been found at Badger Head, Cascade River, Frankford, Heazlewood, Mackintosh River, Mainwaring Inlet, Mt Jukes, Mt Lyell, Scamander River and Zeehan.

MARCASITE see Pyrite

MORION see Quartz

OCCIDENTAL TOPAZ see Quartz

OLIVINE (Group) magnesium and iron silicates;
H = 6.5–7; SG = 3.2–4.4; CS = orthorhombic

Olivine is usually grass green to olive green in colour, glassy and transparent to translucent, and is known as peridot or chrysolite in the gem trade. Most Tasmanian olivine is forsterite, the magnesium-rich member, but some is fayalite, the iron-rich member. Olivine is a major component of most basalts, mostly in very fine grains, but sometimes in coarse phenocrysts. It may also occur in coarse-grained aggregates known as xenoliths, derived from deep in the Earth. The crystals in these rocks may be up to a few centimetres, and these may be of gem quality.

Olivine-rich xenoliths are locally abundant at Deloraine, Doctors Rocks, Don Heads, East Arm, Emu River, Hampshire, Scottsdale, Derby, The Sideling, Great Lake, Mt Wellington, Huonville, Upper Forth River, Waratah, Wilmot, Branxholm, Weldborough and many other areas. Alluvial crystal fragments up to a centimetre or more have been found in the Ringarooma River downstream from Derby. This olivine is frequently gemmy, and larger stones make good gems.

ONYX see Quartz

OPAL hydrated amorphous silica;
H = 5.5–6.5; SG = 1.9–2.3

No confirmed occurrences of precious opal have been recorded but common opal of various colours has been found at Bothwell, Brighton, Cape Barren Island, Cornelian Bay, Cygnet, Flinders Island, Goulds Country, Harman River, Lake Sorell, Lindisfarne, Macquarie Harbour, Montagu, Mt Cameron, Parsons Hood, Pieman River, Proctors Road, Rushy Lagoon area, Sandy Bay, Shag Bay, and Supply River. Much of this is of lapidary interest.

Wood opal is sometimes referred to as fossilised wood, opalised wood or silicified wood. Much of the wood opal in Tasmania was formed when Tertiary basalt flowed over forest areas and associated silicification preserved the wood structure. Fragments are found in post-basalt gravels or *in situ* at the base of basalt flows during quarrying operations. Silicified wood is sometimes found in Permian rocks. Notable occurrences of wood opal are at Brighton, Carrick, Cataract Gorge, Coles Bay, Conara, Cornelian Bay, Derby, Dial Range, Epping Forest, Evandale, Flinders Island, Franklin Rivulet, Gladstone, Gretna, Hadspen, Hampshire, Hollow Tree, near Howard Plains, Howrah, Kentish Plains, Lake Sorell, Latrobe, Launceston, Little Forester River, Longford, Lune River, Macquarie Plains, Mangalore, Meadowbank, Penstock, Port Sorell, Queen River, Richmond, Rose Bay, Ross, Swansea and Waddamana.

ORIENTAL EMERALD see Corundum

ORIENTAL TOPAZ see Corundum

PEARL Calcium carbonate;
H = 3; SG = 2.9; CS = orthorhombic

This is a natural, biogenic form of aragonite. Small, well-formed pearls, to a few millimetres in diameter, have been found in oysters near Dodges Ferry (C. Bain, pers. comm.).

PERIDOT see Olivine

PETRIFIED WOOD AND FERN

Most petrified wood and fern is chalcedonic but some is opaline (see *Opal*). It is widely used as a semi-precious gemstone, usually in varied shades of brown and with distinct woody textures and banding. The petrified ferns can have intricate patterns and colouration and good specimens may be very valuable. These gem quartz/chalcedony varieties have been recorded from numerous localities including Flinders Island, Mt Cameron, Goulds Country, Tamar Heads, Tunnel Marsh, Lake Sorell, Bushy Park, Little Swanport and, in particular, the designated fossicking areas at Lune River–Coal Hill, Penguin and Weymouth.

Generally only smaller, rhizomatous stems of petrified fern occur at Hadspen, Penstock Lagoon, Milton, Little Swanport, Swanwick and Woodbury. These show evidence of being more water washed and transported, and are most likely Triassic in age. By contrast, Lune River materials are angular in form and appear to be little-weathered and have been transported downslope only a short distance from their original position. They range from a diminutive bracken-type rhizome to sturdy arborescent forms, not unlike some of today's tree ferns.

Collecting of the gems (agate and petrified wood) at Lune River led to systematic palaeontological studies of the fern materials, with work on the wood (auraucarioides?) and cycad type (cycadeoidales?) materials still awaiting expertise and funding for their study. Since work began on the Lune River Cretaceous permineralised ferns in the mid-1970s, over a dozen species have been described. Of the 15 species of *Osmundacaulis* from mid-Mesozoic strata world-wide, 13 are known from the southern hemisphere and eight of these are from Lune River. Arborescent in habit, they ranged in height with stems upwards of 450 mm in diameter. Species identified to date include *Osmundacaulis nerii*, *O. jonesii*, *O. janii*, *O. richmondii*, *O. pruchnickii*, *O. griggsii*, *O. tasmanensis* and *O. andrewii*. The closely related genus *Ashicaulis* is represented with one species, *A. wrightii*. Three new genera have also been located in the Lune River flora and placed in the fossil fern record; the tree ferns *Oguracaulis banksii* and *Cibotium tasmanense* and the rhizomatous bracken-type fern *Tasmanopteris richmondii*.

PHENAKITE beryllium silicate;
H = 7.5–8; SG = 3.0;
CS = hexagonal-rhombohedral

This topaz-like mineral has been reported from Moina and the Blue Tier, but not confirmed.

PIEMONTITE see Epidote

PLEONASTE see Spinel

PORPHYRY Generally potassium aluminium silicate-rich rocks;
H = 6; SG = 2.6

This includes various igneous rocks, usually very feldspar rich, with coarse crystals in a finer groundmass. Numerous bodies of syenitic porphyry occur near Cygnet. These vary from off-white to pink, dark grey and bright green, with large white to cream-coloured tabular crystals of sanidine feldspar in a darker, feldspathic matrix. They have been descriptively termed biscuit-rock or magpie-rock and other names. These rocks can take a good polish where fresh,

and are of some lapidary interest, although some of the occurrences are listed as geological heritage sites.

PRASE see Quartz

PREHNITE hydrous calcium aluminium silicate;
H = 6–6.5; SG = 2.8–3.0; CS = orthorhombic

This green mineral is moderately common in many altered igneous and other rocks in Tasmania, but is not known in cuttable quality.

PYRITE iron disulphide;
H = 6–6.5; SG = 5.0–5.1; CS = cubic

Pyrite is pale bronze-yellow with a metallic lustre and is used occasionally as a semi-precious stone. It is very common in areas of sulphide mineralisation on the West Coast. Marcasite, a polymorph of pyrite, has been found at Cox Bight, Cape Barren Island, Magnet, Mt Lyell and Scamander River. Much of the 'marcasite' in jewellery is actually pyrite.

QUARTZ silicon dioxide;
H = 7; SG = 2.65; CS = hexagonal

A number of gemstones are of this composition and the different varieties have their own individual names.

Cryptocrystalline varieties (Chalcedony)

Chalcedony is fine-grained quartz of various colours with a waxy lustre, and occurs in seams associated with Tertiary volcanic rocks, in post-basalt gravel, and sometimes near the contacts of Jurassic dolerite bodies. It has been found at Beaconsfield, Cape Portland, Cornelian Bay, Flinders Island, Goulds Country, Heazlewood, Lake Sorell, Lisle, Little Swanport, Meredith Range, Mt Cameron, Pieman River, Sandy Bay, Tamar Heads and Zeehan.

Gem chalcedony occurs in a number of forms, and individual names have been given to the different varieties, for example:

Agate: banded chalcedony, often with an almost circular pattern.

Cornelian or Carnelian: red chalcedony.

Cornelian Agate: red and white agate.

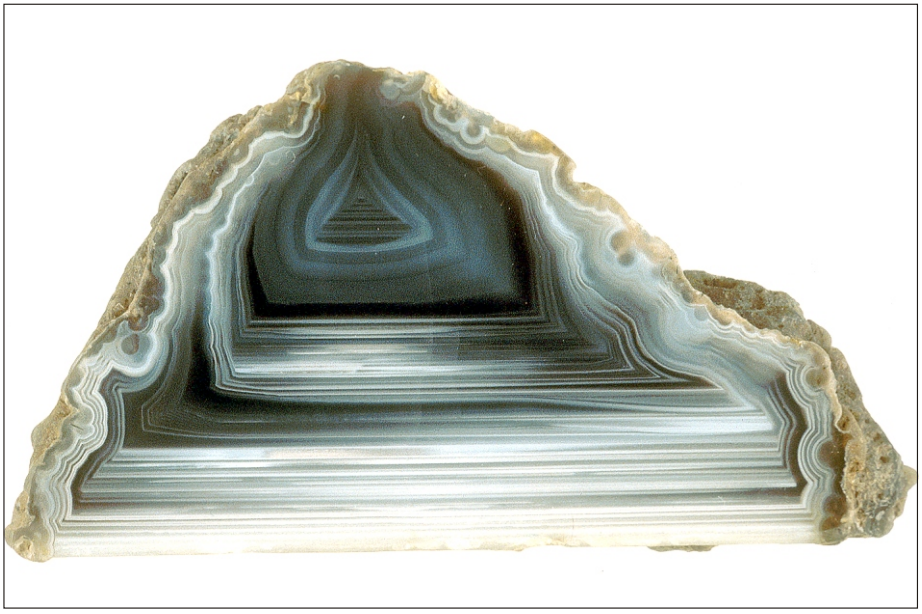
Iris Agate: a type of clear agate displaying rainbow colours.

Moss Agate: chalcedony with moss-like or dendritic structures.

Onyx: black and white banded chalcedony in even planes.

Sard: deep brownish red chalcedony.

Sardonyx: brown and white banded chalcedony in even planes.



Agate, Carrick district

Quartz (amethyst), Mt Heemskirk [Photo: Ralph Bottrill]

There are many areas where these members of the chalcedony group occur. They are often found together and in association with wood opal. Many appear to have been formed during Tertiary volcanism and are found in post-basalt gravel, and some are probably formed at Jurassic dolerite contacts. Agate and other forms of chalcedony can be seen in seams and nodules in the basalt at Lune River. Grey agate can be found as pebbles in basal Permian tillite at Wynyard, and this rock type may be the source of large numbers of grey agates in terrace gravels along the lower Huon River. Their location prior to deposition as pebbles in the tillite is unknown. Grey-white agates occur in dolomite at Corinna.

Occasional agates and onyx can be found in many areas in Tasmania where gravel occurs, but some of the more notable areas are Blakes Opening, Bothwell, Bronte, Camden Plains, Campania, Cape Portland, Carrick, Cornelian Bay, Cradoc, Cranbrook, Dee Lagoon, Droughty Point, Fingal, Flinders Island, Forth River, Gladstone, Hagley, Heazlewood, Howrah, Huon River, Ilfraville (Beauty Point), Interlaken, Lake Sorell, Lake St Clair, Leven River, Lindisfarne Bay, Little Pine Lagoon, Little Swanport, Lobster Creek, Longford, Lune River, Lymington, Mangalore, Mt Barrow, Mt Cameron, Oatlands, Penna, Penstock, Petcheys Bay, Preolenna, Randalls Bay, Richmond, Ringarooma Bay, Rose Bay, Stony Head, Supply River, Swansea, Tunbridge, Westbury, Weymouth, Windermere and Wynyard.

Iris agate is not common but has been collected from the Gladstone area and Cape Portland.

A number of opaque to translucent varieties of chalcedony and cryptocrystalline quartz of varying purity and colour are sometimes used as gem material. These are similar in composition and form and are sometimes not differentiated — some or all are at times included under the term chert.

CHERT, FLINT: variously coloured chalcedony and cryptocrystalline quartz with a splintery fracture. Occurs as bedded deposits of red banded material in the Forth River, Leven River, Penguin and other areas, and as grey banded beds in the Smithton district, and has been reported from Weymouth. It also occurs as nodules in some rocks — particularly in dolomite around Smithton. Banded chert has been found at Beaconsfield.

HORNSTONE: hornstone is said to be like chert but is more opaque. It has been recorded from Cornelian Bay, Flinders Island, Forth River, Macquarie Harbour, Mt Bischoff, Mt Nelson and Pieman River.

JASPER: cryptocrystalline quartz with iron oxides producing the various colours. It is usually red but yellow, brown, black and green varieties are known. Jasper has been found at Adamsfield, Avoca, in the Arthur River about 10 km from Waratah (red and green), Campbell Town, Carrick, Corinna, Dial Range, Magnet, Merseylea, Mt Heemskirk, in the Old Jasper

mine, Penstock, Pioneer, Poatina, Ringarooma Bay, Targa and Lobster Creek near Ulverstone.

PRASE: a translucent yellowish-brown to dull green variety of chalcedonic quartz with a waxy lustre. It has been found at Hampshire, Lake Sorell, Magnet Range and Tasman River.

Crystalline varieties

AMETHYST: a violet-coloured variety of quartz which has been found in alluvial tin areas in northeastern Tasmania, e.g. Big Grassy Hill (west Cape Barren Island), Cape Portland, Derby, Gladstone, Mt Cameron, Mt Heemskirk, Moorina, and South Mt Cameron. It has also been found at Blue Tier, south of Hampshire at the Emu River where it occurs with garnet, at Mt Read grading into smoky quartz, at Rossarden and Lune River.

CITRINE: also known as occidental topaz, false topaz and at times just topaz. It is a yellow variety of quartz and occurs at Goulds Country, Mt Cameron, Mt Heemskirk, Moorina and Rex Hill mine.

ROCK CRYSTAL: a clear colourless form of quartz which has been found at Beaconsfield, Ben Lomond, Branxholm Creek, Dorset Flats, Dundas, Flinders Island, Gipps Creek, Gladstone, Goulds Country, Lefroy, Moina, Moorina, Mt Cameron, Mt Heemskirk, Mt Maurice, east of Mt Stronach, Pioneer, Rocky Gully (Tonganah), Rossarden, South Mt Cameron, St Pauls River and Savage River.

ROSE QUARTZ: pink coloured; only poor specimens have been reported from Beaconsfield, Blue Tier, Lefroy, Moorina and the West Coast.

RUTILATED QUARTZ: fine acicular crystals of rutile in quartz crystals have been found in the Gladstone area and at Howard Plains.

SMOKY QUARTZ: almost black to smoky brown and smoky yellow; a number of different names based on colour varieties have been used; e.g. morion, cairngorm, Scotch topaz. It has been found at Avoca, Ben Lomond, Blue Tier, Cape Barren Island, Cox Bight, Derby, Flinders Island, Gladstone, Hampshire, Moina, Moorina, Mt Cameron, Mt Heemskirk, Mt Read, Rex Hill mine, Savage River, Smithton and Tulendeena.

RHODOCHROSITE manganese carbonate;
H = 3.5–4.5; SG = 3.4–3.6; CS = hexagonal

Rhodochrosite is usually pinkish to red in colour and is sometimes cut as a semi-precious gemstone, despite its low hardness. It has been found in mines at Dundas, Kara, Magnet, Rosebery and Zeehan.

RHODONITE manganese silicate;
H = 5.5–6.5; SG = 3.4–3.7; CS = triclinic

Rhodonite is usually pink to red in colour and has been reported from Andersons Creek, near Beaconsfield, although a sample tested was found to be clinozoisite var. 'thulite'. There is an unconfirmed report of rhodonite occurring at Zeehan.

ROCK CRYSTAL see Quartz

ROSE QUARTZ see Quartz

RUBY see Corundum

RUBY TIN see Cassiterite

RUTILE titanium dioxide;
H = 6–6.5; SG = 4.2–5.2; CS = tetragonal

Rutile is usually red-brown to black in colour but red, yellow, blue and green crystals are known. It is very common but is mostly found as very fine grains, and no gem quality material is known in Tasmania. Notable areas include Arthur River, Cape Barren Island, Claytons Rivulet (up to 15 mm crystals), Franklin River, Fraser River (King Island), Hudson and Lewis rivers, Low Rocky Point, Lymington, Mt Anne (12 mm crystals), Moorina, Ocean Beach (near Strahan), Rocky Cape and various beaches in southwest Tasmania.

SAPPHIRE see Corundum

SARD see Quartz

SARDONYX see Quartz

SCHORL see Tourmaline

SCOTCH TOPAZ see Quartz

SERPENTINE (Group) hydrated magnesium silicate;
H = 2.5–4; SG = 2.5–2.7; CS = monoclinic

This group includes antigonite, crysotile and lizardite species. Serpentine has been used as a gemstone and also in rock carvings but its use as a gemstone is limited because of the low hardness. It occurs in large masses in the Adamsfield, Beaconsfield, Claytons Rivulet, Heazlewood–Waratah, Rosebery and Macquarie Harbour areas.

Stichtite in serpentine, Dundas [Ralph Bottrill]

SMOKY QUARTZ see Quartz

SPHENE calcium titanium silicate;
H = 5–5.5; SG = 3.4–3.6; CS = monoclinic

Sphene is yellow to brown in colour but rarely occurs in crystals large enough to cut. Occurrences include Cygnet, Heazlewood River, Mt Ramsay and Parsons Hood.

SPINEL (Group) aluminates, ferrates, chromates and manganates of magnesium, iron, zinc and manganese;
H = 5.5–8; SG = 3.5–5.2 (these two properties vary with composition); CS = cubic

The members of this group found in Tasmania include spinel, magnetite, hercynite, chromite, magnesiochromite, maghemite and gahnite; most of the spinel group are black. Pleonaste (ferroan spinel, usually black) is common in alluvial tin areas, e.g. Derby, Gladstone, Rossarden and Weldborough. Hercynite (iron spinel — black) is found at Moorina and gahnite (zinc spinel — usually green) is reported from Mt Bischoff. Green spinel has been recorded from King Island. Some black spinel is found in xenoliths with olivine in basalt at Derby. The black spinel takes a very good polish.

STAUROLITE hydrated iron aluminium silicate;
H = 7–7.5; SG = 3.6–3.8; CS = orthorhombic

Crystals of staurolite have been found in the Reekara area on King Island but are not of gem quality.

STICHTITE hydrous chromium magnesium carbonate;
H = 1.5–2; SG = 2.2; CS = hexagonal

A rare, soft, lilac to mauve or purple, serpentine-like mineral, usually found as blebs in serpentine bodies, often with chromite grains. Barbertonite, chlorite and other minerals may be included in small amounts. Like serpentine, it is too soft for normal gem use, but is colourful, contrasts dramatically with the associated apple green serpentine and takes a good polish, so is a rather desirable lapidary material. It is mined commercially, intermixed with serpentine, at Stichtite Hill, near Dundas, for ornamental carving and polishing purposes. It is also found in other areas near Dundas, and near Macquarie Harbour.

THULITE see Epidote

TOPAZ hydrated fluoro-aluminium silicate;
H = 8; SG = 3.4–3.6; CS = orthorhombic

Topaz is usually regarded as a yellow stone when used as a gemstone but many of the Tasmanian stones are colourless to pale green. It is often mistaken for quartz but topaz is harder and has a distinct cleavage. Topaz is a common accessory mineral in granite and pegmatite and is often found concentrated in alluvial tin workings, e.g. Branxholm Creek, Cape Barren Island, Coles Bay, Derby, Dorset Flats, Gladstone, Killiecrankie Bay (Flinders Island), Moorina, Mt Cameron, St Pauls River, Tanners Bay (Flinders Island), Weldborough, Weld River and Wyniford River. Other occurrences include Beaconsfield, Bell Mount (in quartz porphyry), Coles Bay, Gipps Creek, Lefroy, Long and Brown Plains (between the Heazlewood and Pieman rivers), Mathinna, Moina (with tin-tungsten ore), Mt Bischoff (in porphyry), Rossarden, St Helens and the Stanley River tin field. Stones of gem quality have been found in a number of these localities, the most notable of which is the Flinders Island area. Topaz crystals at Killiecrankie Bay have been referred to as 'Killiecrankie diamonds'. Good blue stones occur at Moina.

TOURMALINE (Group) complex silicate of aluminium and boron;
H = 7–7.5; SG = 3.0–3.2; CS = hexagonal.

Minerals of this group found in Tasmania include dravite and schorl. Tourmaline occurs as slender prismatic bunches of crystals in most localities named. It is a common accessory mineral in granite in the North East, Bass Strait islands and West Coast. Most occurrences are of the black species (schorl)

which is of low value as a gem. Acicular green crystals of tourmaline have been recorded at Lake Lea, Mt Bischoff, Mt Heemskirk, Mt Lyell, Mt Montgomery, and Stanley River. Brown tourmaline occurs at Mt Heemskirk and is said to occur at Mt Lyell and Mt Ramsay.

TURQUOISE hydrated aluminium and copper phosphate;
H = 5.6; SG = 2.6–2.8; CS = triclinic but is generally amorphous to cryptocrystalline

Turquoise is generally sky blue but blue-green and apple green varieties are known. Thin seams have been found in the Lefroy–Back Creek area and Den Ranges (East Tamar), and occurrences at Beaconsfield and Waddamana have been recorded. Green seams and occasionally blue pieces have been found south of the Arthur River to the southeast of Trowutta. Good gems have been cut from Back Creek material.

UVAROVITE see Garnet

VARISCITE hydrated aluminium phosphate;
H = 3.5–4.5; SG = 2.6; CS = orthorhombic

This is not known to have been cut as a gemstone in Tasmania, but has been reported as massive green material at Back Creek, and in other areas.

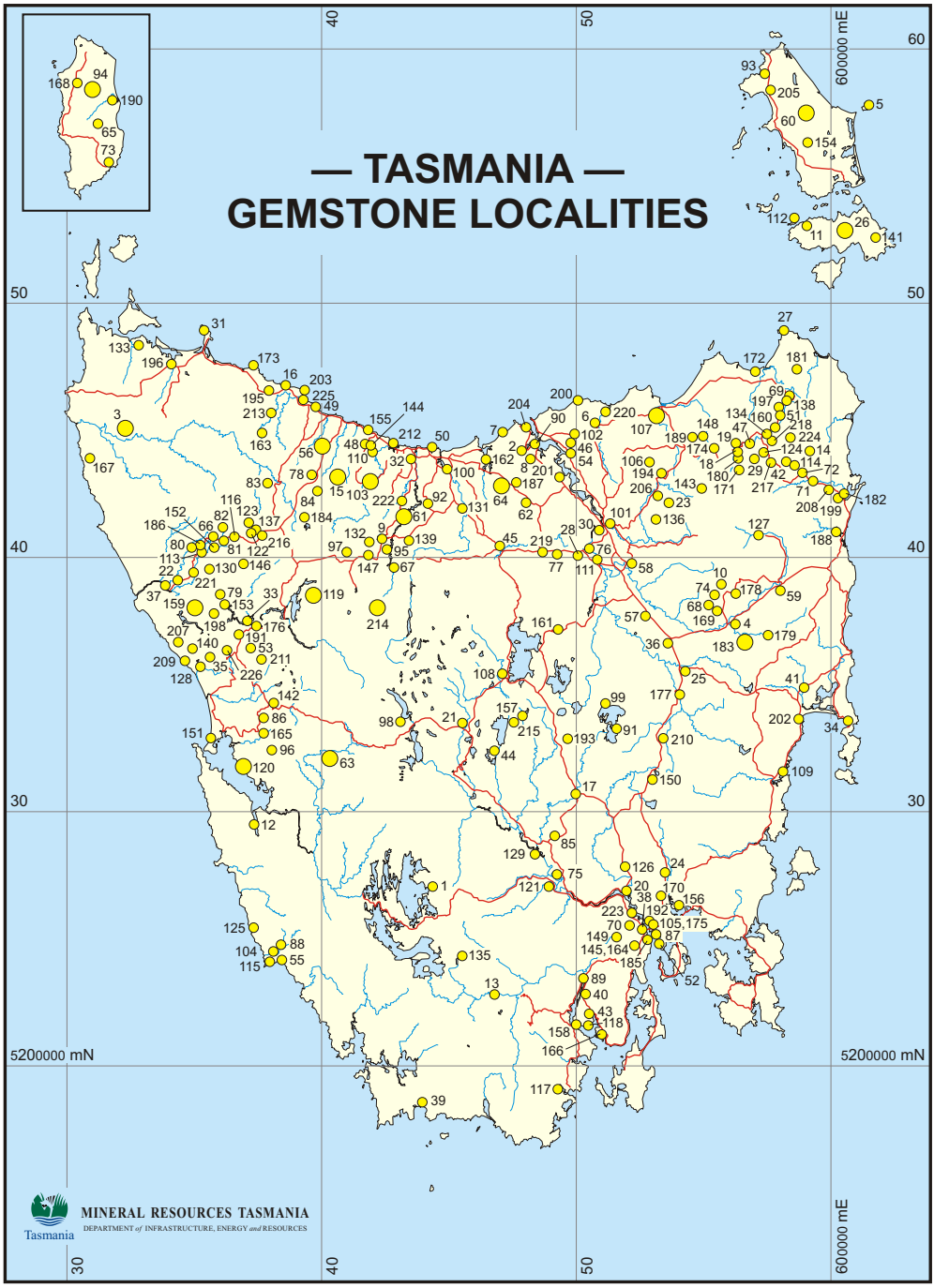
WOLLASTONITE calcium silicate;
H = 4.5–5; SG = 2.8–2.9; CS = monoclinic

Wollastonite is normally white in colour but can also be grey, yellow, red or brown. It is related to rhodonite and is sometimes cut as a semi-precious gem. It occurs at Glenorchy, Hampshire, Moina and Proctors Road, but no Tasmanian stones are known to have been cut for gems.

WOOD OPAL see Opal

ZIRCON zirconium silicate;
H = 7.5; SG = 4.7; CS = tetragonal

Zircon is an accessory mineral in granite and is commonly found concentrated in alluvial tin workings, e.g. Derby, Flinders Island, Gladstone, Long Island, Moorina, Ruby Flats, Weldborough and Weld River. Other areas where it has been found include Arthur River, Beaconsfield, Blythe River, Boat Harbour–Sisters Creek (in sub-basalt gravel), Circular Head, Forth River, Meredith Range, Penguin, Rossarden, Trial Harbour and Upper Calder. The zircon is usually brown to red (hyacinths and jacinths) but colourless and yellow (jargoons) and green specimens have been recorded. The crystals are seldom large enough to cut as gems and many of the larger ones are fractured.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GEMSTONE LOCALITIES
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INDEX TO GEMSTONE LOCALITY MAP

1	Adamsfield	Corundum, jasper, serpentine, sapphire
2	Andersons Creek	Clinozoisite, rhodonite, serpentine
3	Arthur River	Jasper, rutile, turquoise, zircon
4	Avoca	Jasper, smoky quartz
5	Babel Island	Fluorite
6	Back Creek	Chrysocolla, turquoise, variscite
7	Badger Head	Malachite
8	Beaconsfield	Chalcedony, banded chert, rose quartz, rock crystal, topaz, turquoise, zircon
9	Bell Mount	Beryl, garnet, topaz
10	Ben Lomond	Beryl, fluorite, rock crystal, smoky quartz
11	Big Grassy Hill	Amethyst
12	Birchs Inlet	Agate, onyx, stichtite
13	Blakes Opening	Agate
14	Blue Tier	Amethyst, fluorapatite, phenakite, rose quartz, smoky quartz, andalusite
15	Blythe River	Sapphire, zircon
16	Boat Harbour	Sapphire, zircon
17	Bothwell	Agate, onyx, common opal
18	Branxholm	Cassiterite, sapphire
19	Branxholm Creek	Rock crystal, topaz
20	Brighton	Common opal, wood opal
21	Bronte	Agate
22	Brown Plains	Topaz
23	Camden Plains	Agate
24	Campania	Agate
25	Campbell Town	Jasper
26	Cape Barren Island	Amethyst, common opal, garnet, marcasite (pyrite), rutile, smoky quartz, topaz
27	Cape Portland	Agate, amethyst, chalcedony, iris agate, fluorapatite
28	Carrick	Agate, jasper, wood opal
29	Cascade River	Azurite, malachite
30	Cataract Gorge	Wood opal
31	Circular Head	Zircon
32	Claytons Rivulet	Rutile, serpentine
33	Colebrook Mine	Ferroaxinite, datolite
34	Coles Bay	Cassiterite, wood opal, sapphire, topaz
35	Comstock	Garnet
36	Conara	Wood opal
37	Corinna	Jasper, diamond, agate

38	Cornelian Bay	Agate, hornstone, common opal, wood opal
39	Cox Bight	Marcasite (pyrite), smoky quartz
40	Cradoc	Agate
41	Cranbrook	Agate
42	Crystal Hill	Fluorapatite
43	Cygnet	Garnet, common opal, sphene
44	Dee Lagoon	Agate
45	Deloraine	Epidote, olivine
46	Den Ranges	Turquoise
47	Derby	Amethyst, chrysoberyl, olivine, smoky quartz, sapphire, spinel, topaz, wood opal, zircon
48	Dial Range	Jasper, wood opal
49	Doctors Rocks	Olivine
50	Don Heads	Olivine
51	Dorset Flats	Rock crystal, topaz
52	Droughty Point	Agate
53	Dundas	Azurite, crocoite, epidote, ferroaxinite, rock crystal, rhodochrosite, stichtite
54	East Arm	Olivine
55	Elliott Bay	Piemontite
56	Emu River	Amethyst, epidote, garnet, olivine
57	Epping Forest	Wood opal
58	Evandale	Wood opal
59	Fingal	Agate
60	Flinders Island	Agate, beryl, cassiterite, hornstone, common opal, wood opal, rock crystal, smoky quartz, topaz, zircon
61	Forth River	Agate, chert, epidote, hornstone, zircon
62	Frankford	Malachite
63	Franklin River	Rutile
64	Franklin Rivulet	Wood opal
65	Fraser River	Rutile
66	Gabbro Hill	Diamond(?)
67	Gads Hill	Azurite
68	Gipps Creek	Rock crystal, topaz
69	Gladstone	Agate, iris agate, amethyst, wood opal, rutilated quartz, smoky quartz, rock crystal, sapphire, spinel, topaz, zircon
70	Glenorchy	Wollastonite
71	Goshen	Cassiterite
72	Goulds Country	Chalcedony, citrine, common opal, rock crystal
73	Grassy	Epidote, garnet
74	Great Republic Mine	Beryl, fluorite, smoky quartz, rock crystal

75	Gretna	Wood opal
76	Hadspen	Wood opal
77	Hagley	Agate
78	Hampshire	Amethyst, azurite, ferroaxinite, fluorite, fluorapatite, garnet, prase, olivine, wood opal, wollastonite
79	Harman River	Common opal
80	Harveys Creek	Diamond
81	Heazlewood	Agate, chalcedony, crocoite, malachite, serpentine
82	Heazlewood River	Azurite, garnet, sphene
83	Hellyer River	Diamond(?)
84	Highwood Hill	Garnet
85	Hollow Tree	Wood opal
86	Howard Plains	Wood opal, rutilated quartz
87	Howrah	Agate, wood opal
88	Hudson River	Garnet, rutile
89	Huon River	Agate
90	Ilfraville	Agate
91	Interlaken	Agate
92	Kentish Plains	Wood opal
93	Killiecrankie Bay	Topaz
94	King Island	Epidote, garnet, green spinel, rutile, staurolite, andalusite
95	Lake Cethana	Beryl
96	Lake Jukes	Epidote
97	Lake Lea	Tourmaline
98	Lake St Clair	Agate
99	Lake Sorell	Agate, common opal, wood opal, prase
100	Latrobe	Wood opal
101	Launceston	Wood opal, sapphire
102	Lefroy	Rose quartz, rock crystal, topaz, turquoise
103	Leven River	Agate, chert
104	Lewis River	Garnet, rutile
105	Lindisfarne	Agate, common opal
106	Lisle	Chalcedony, sapphire
107	Little Forester River	Wood opal
108	Little Pine Lagoon	Agate
109	Little Swanport	Agate
110	Lobster Creek	Agate, jasper
111	Longford	Agate, wood opal
112	Long Island	Zircon

113	Long Plains	Topaz
114	Lottah	Fluorite, star sapphire
115	Low Rocky Point	Rutile
116	Luina	Fluorite
117	Lune River	Agate, amethyst, wood opal
118	Lymington	Agate, rutile
119	Mackintosh River	Azurite, malachite
120	Macquarie Harbour	Hornstone, common opal, serpentine
121	Macquarie Plains	Wood opal
122	Magnet Mine	Crocoite, jasper, marcasite (pyrite), rhodochrosite
123	Magnet Range	Epidote, prase
124	Main Creek	Sapphire
125	Mainwaring Inlet	Azurite, epidote, malachite
126	Mangalore	Agate, wood opal
127	Mathinna	Fluorapatite, topaz
128	Maynes Tin Mine	Garnet
129	Meadowbank	Wood opal
130	Meredith Range	Chalcedony, zircon
131	Merseylea	Jasper
132	Moina	Aquamarine, beryl, garnet, phenakite, rock crystal, topaz, wollastonite, fluorite, smoky quartz
133	Montagu	Common opal
134	Moorina	Amethyst, citrine, hercynite, sapphire, smoky quartz, rock crystal, rose quartz, rutile, topaz, zircon
135	Mount Anne	Rutile
136	Mount Barrow	Agate
137	Mount Bischoff	Epidote, fluorite, fluorapatite, gahnite, hornstone, topaz, tourmaline, beryl
138	Mount Cameron	Agate, amethyst, beryl, cassiterite, citrine, common opal, rock crystal, sapphire, smoky quartz, topaz
139	Mount Claude	Epidote, garnet
140	Mount Heemskirk	Jasper, rock crystal, tourmaline, smoky quartz
141	Mount Kerford	Garnet
142	Mount Lyell	Azurite, malachite, marcasite, brown tourmaline, green tourmaline
143	Mount Maurice	Rock crystal
144	Mount Montgomery	Tourmaline
145	Mount Nelson	Hornstone
146	Mount Ramsay	Ferroaxinite, fluorite, garnet, sphene, brown tourmaline

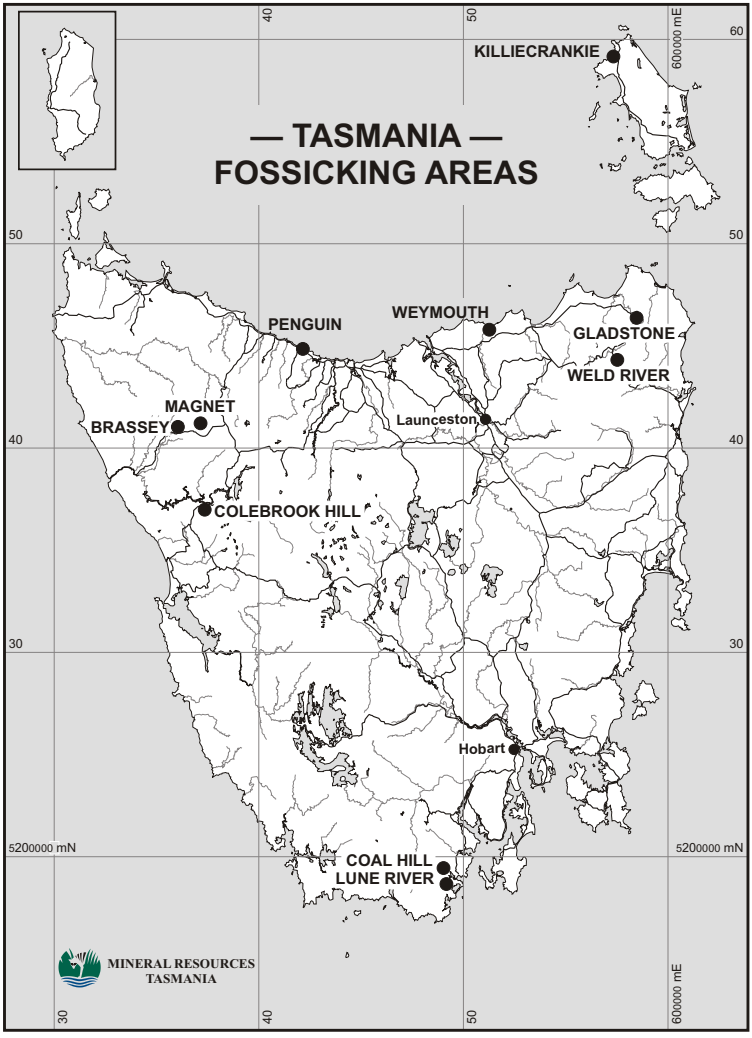
147	Mount Stormont	Garnet
148	Mount Stronach	Rock crystal, sapphire
149	Mount Wellington	Olivine
150	Oatlands	Agate
151	Ocean Beach	Rutile
152	Old Jasper Mine	Jasper
153	Parsons Hood	Common opal, ferroaxinite, sphene
154	Pats River	Cassiterite
155	Penguin	Azurite, chert, zircon
156	Penna	Agate
157	Penstock	Agate, jasper, wood opal
158	Petcheys Bay	Agate
159	Pieman River	Chalcedony, diamond(?), hornstone, common opal
160	Pioneer	Jasper, rock crystal
161	Poatina	Jasper
162	Port Sorell	Wood opal
163	Preolenna	Agate
164	Proctors Road	Common opal, wollastonite
165	Queen River	Wood opal
166	Randalls Bay	Agate
167	Rebecca Creek	Amber
168	Reekara	Staurolite
169	Rex Hill Mine	Citrine, smoky quartz
170	Richmond	Agate, wood opal
171	Ringarooma	Chrysocolla
172	Ringarooma Bay	Agate, jasper
173	Rocky Cape	Rutile
174	Rocky Gully	Rock crystal
175	Rose Bay	Agate, wood opal
176	Rosebery	Fluorite, rhodochrosite, serpentine
177	Ross	Wood opal
178	Rossarden	Amethyst, cassiterite, rock crystal, spinel, topaz, zircon
179	Royal George	Beryl
180	Ruby Flats	Cassiterite, zircon
181	Rushy Lagoon	Common opal
182	St Helens	Topaz
183	St Pauls River	Beryl, rock crystal, topaz
184	St Valentines Peak	Epidote
185	Sandy Bay	Chalcedony, common opal, fluorapatite
186	Savage River	Smoky quartz, rock crystal

187	Saxons Creek	Azurite
188	Scamander River	Azurite, malachite, marcasite
189	Scottsdale	Olivine
190	Sea Elephant	Garnet
191	Serpentine Hill	Stichtite
192	Shag Bay	Common opal
193	Shannon Tier	Fluorapatite
194	Sideling	Olivine
195	Sisters Creek	Sapphire, zircon
196	Smithton	Azurite, chert, epidote, smoky quartz
197	South Mount Cameron	Amethyst, rock crystal
198	Stanley River	Sapphire, topaz, tourmaline
199	Stonyford	Garnet
200	Stony Head	Agate
201	Supply River	Agate, common opal
202	Swansea	Agate, wood opal
203	Table Cape	Epidote, sapphire
204	Tamar Heads	Chalcedony
205	Tanners Bay	Topaz
206	Targa	Jasper
207	Tasman River	Prase
208	Thureaus Deep Lead	Beryl
209	Trial Harbour	Garnet, zircon
210	Tunbridge	Agate
211	Tyndall Range	Epidote
212	Ulverstone	Jasper
213	Upper Calder	Zircon
214	Upper Forth River	Olivine
215	Waddamana	Wood opal, turquoise
216	Waratah	Cassiterite, crocoite, jasper, olivine, serpentine
217	Weldborough	Sapphire, spinel, topaz, zircon
218	Weld River	Chrysoberyl, sapphire, topaz, zircon
219	Westbury	Agate
220	Weymouth	Agate, chert
221	Whyte River	Crocoite, epidote, garnet
222	Wilmot River	Olivine
223	Windermere	Agate
224	Wyniford River	Topaz
225	Wynyard	Agate
226	Zeehan	Azurite, chalcedony, crocoite, fluorite, malachite, rhodochrosite, rhodonite(?), chiastolite

Fossicking Areas

Areas at several locations throughout Tasmania have been set aside for the use of the general public as Fossicking Areas. Commercial collecting and the use of machinery in these areas is prohibited.

Location details of these fossicking areas, and guidelines under which fossicking can be undertaken, are outlined in a brochure available from Mineral Resources Tasmania or from the MRT website. For fossicking outside of these areas a prospecting licence should be obtained from Mineral Resources Tasmania for a small annual fee.



Topaz, Killiecrankie, Flinders Island [Photo: Tony Forsyth]

Sapphire, Blue Tier District, [Photo: Ralph Bottrill]

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