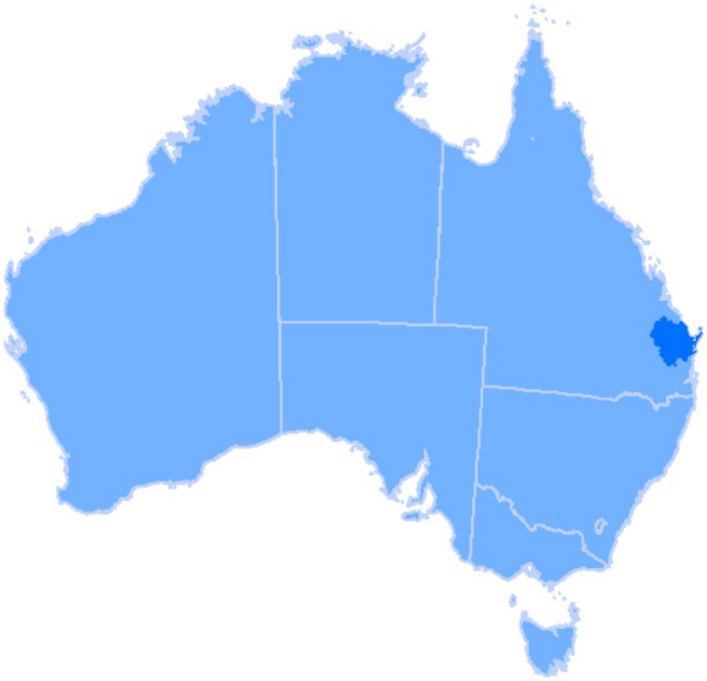
Wide Bay Burnett Minerals Region Investment Attraction Strategy Project (Stages 1 and 2)

Final Report

VOLUME 1



Date: August 2020

Contents

1 Executive Summary 1

2 Geology of the WBB and its influence on mineralisation 4

2.1 Structural Framework of the Region and its influence on mineralisation 4

2.2 Geology of the Region and influence on mineralisation 9

3 Summary of Historic and Current Minerals Exploration and Production 12

4 Market Demand Summary 16

4.1 Aluminosilicates 16

4.2 Bauxite 17

4.3 Coal 17

4.4 Cobalt (Co) 18

4.5 Copper (Cu) 18

4.6 Dimension Stone (Building Stone) 19

4.7 Gold (Au) 20

4.8 Molybdenum (Mo) 20

4.9 Heavy Mineral Sands 21

4.10 Nickel (Ni) 22

4.11 Zinc (Zn) 22

5 Project Matrix 24

5.1 Introduction to the Matrix 24

5.2 Matrix of Projects 26

6 Summary of Infrastructure and Enhancement Potential 37

6.1 Rail 37

6.2 Road 38

6.3 Bundaberg Port 41

6.4 Water 42

6.5 Power 43

Appendix 1 Wide Bay Burnett Region Historic Gold Fields 44

Appendix 2 Projects 46

Appendix 2.1 Exploration Projects 46

Appendix 2.1.1 Mt Cobalt and Pembroke Projects – Aus Tin Mining 46

Appendix 2.1.2 Ban Ban Project – Pennant Resources 47

Appendix 2.1.3 Hawkwood Project – Auburn Resources Ltd 48

Appendix 2.1.4 7B, Ben Hur and Greater Whitewash - AEON Metals 49

Appendix 2.1.5 Barambah – ActivEX 51

Appendix 2.1.6 Esk – ActivEX 52

Appendix 2.1.7 Coalstoun Lakes – ActivEX 53

Appendix 2.1.8 8 Mile Project - MetalBank 54
Appendix 2.1.9 Eidsvold Gold - MetalBank 54
Appendix 2.1.10 Mount Cannindah – Cannindah Resources 55
Appendix 2.1.11 Maryborough Project – BK Exploration 56
Appendix 2.1.12 Red Mountain – Black Dragon Energy 57
Appendix 2.1.13 Flanagans – Black Dragon Energy 57
Appendix 2.1.14 Shamrock Tailings Project – DGR Global Ltd 58
Appendix 2.1.15 Monogorilby – IronRidge Resources 58
Appendix 2.2 Development Projects 59
Appendix 2.2.1 Wateranga – High Titanium Resources Limited 59
Appendix 2.2.2 Binjour/Toondoon – Australian Bauxite 60
Appendix 2.2.3 Abercorn Project, - Abercorn Kaolin 61
Appendix 2.2.4 Goodger, Winters and Nyora – Terrequip Environmental 62
Appendix 2.2.5 Bundaberg – Fox Coal 63
Appendix 2.2.6 Lochaber Creek Project - Eidsvold Siltstone 64
Appendix 2.2.7 Hawkwood Project – Eastern Stone and Minerals 65
Appendix 2.2.8 Maidenwell – Maidenwell Diatomite 65
Appendix 3 Glossary 66
Appendix 4 Terms of Reference 71

1 Executive Summary

The Wide Bay Burnett Region has a diverse range of mineral resources. The Wide Bay Burnett Resources Group has sought to better understand the current most prospective resources in the region for development, as well as any support, infrastructure and clustering gaps and opportunities which may enable more projects to progress to production. The Terms of Reference are provided at Appendix 4.

This work has been undertaken in two parts, Volume 1, summarises the current projects and infrastructure as at mid August 2020 and provides a summary of the key commodities and market analysis for these commodities. Appendix 3 provides a Glossary of Terms. Volume 2 provides further detail of geology, mining and tenement histories and commodity analysis, as at June 2020. The industry is dynamic in terms of turnover of tenements in particular, and any data ought to be checked for currency if being relied upon at a future date.

During the research for this (primarily) desktop report, over 200 tenures have been identified in the region including Mining Lease, Mineral Development Licence, Exploration Permit for Minerals and Exploration Permit for Coal. Over 2000 searches of current and historic tenures were undertaken. Figure 1 below shows the current tenures. There are no current Gas or Geothermal tenures in the region.

The map at Figure 1 shows a level of clustering of projects which reflects the distribution of tenements. There are also industrial minerals such as limestone, dimension stone, bauxite, and other base metals prospects. Many of the base metals are coincident with gold and/or copper.

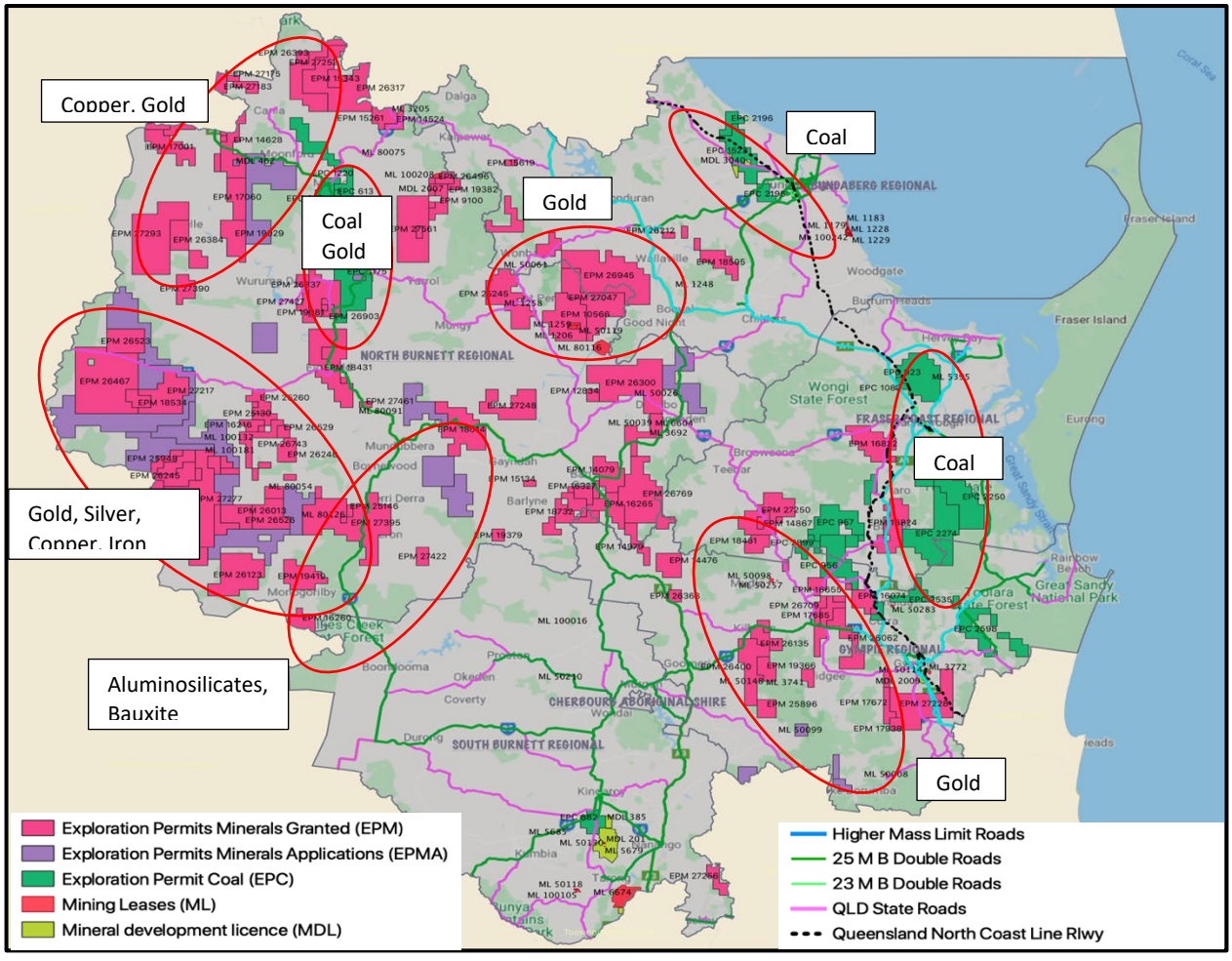


Figure 1: Tenures within the Wide Bay Burnett Region.

The final 18 Exploration (from 15 Companies) and 11 Development (from 8 Companies) projects are shown at Figure 2 below and summarised in tabular form at Section 5.2. Appendix 2 of Volume 1 provides useful further detail on each project. There are a range of commodities being explored for and developed currently in the region, including gold, ilmenite, copper, molybdenum, cobalt, coal, nickel, zinc, dimension stone, bauxite and kaolinite.

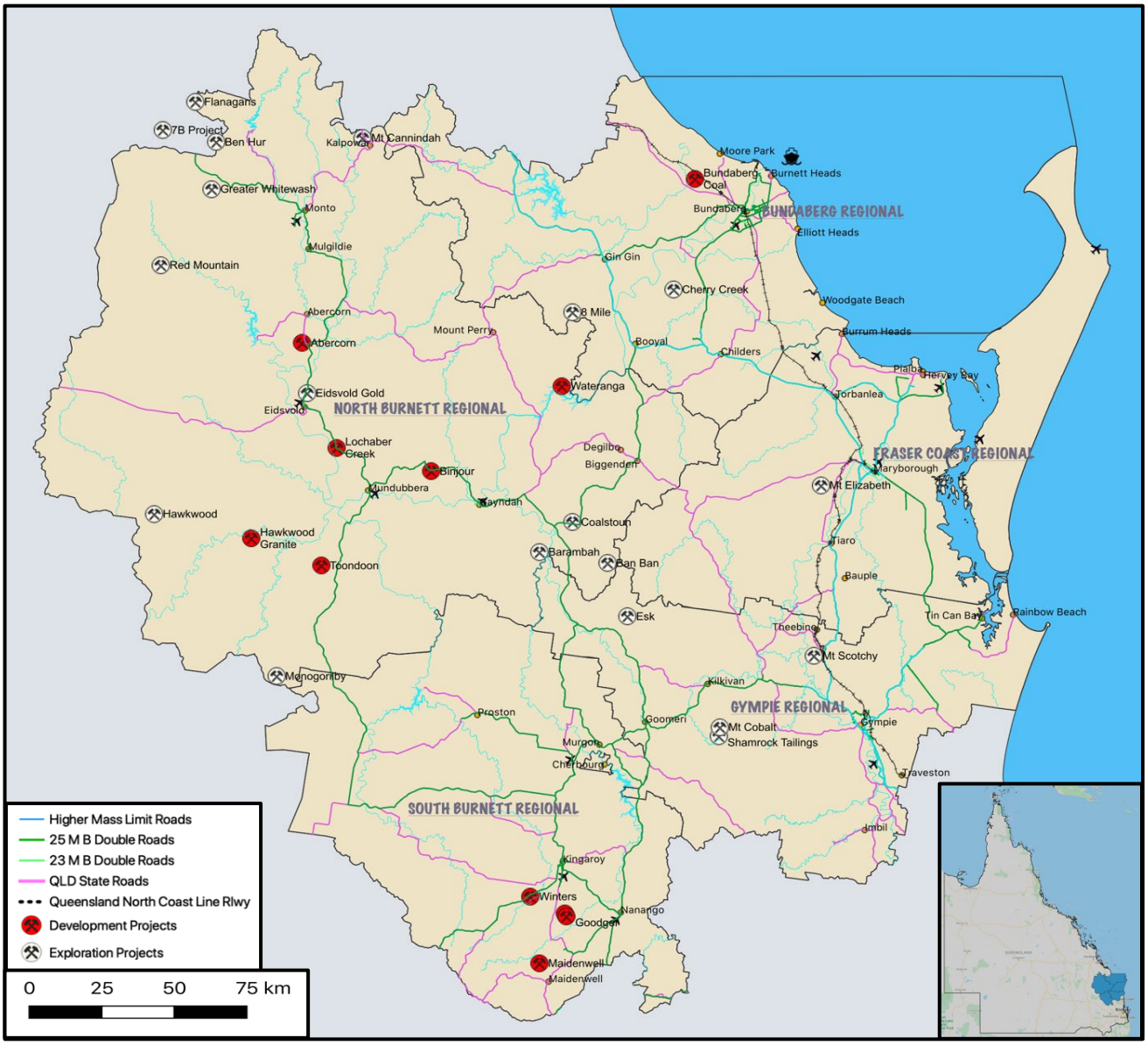


Figure 2: Project List Locations

Section 4 summarises the key commodity markets, with the region highly prospective in particular (but not exclusively) for gold, bauxite, copper, cobalt, nickel, zinc, heavy mineral sands, dimension stone, ilmenite and molybdenum, all of which have strong demand profiles globally. The Wide Bay Burnett Region has an educated, available workforce, and high liveability indices with respect to education, medical and other necessary services available to underpin a successful resources industry. The region's Councils also are strongly supportive of a growing, responsible minerals sector.

The region has over 150 years history of successful mining activities. The necessary infrastructure is in place to support the sector, although this report proposes some transport infrastructure improvements that will enhance the region's competitiveness and benefit all of the natural resources industries (agriculture, fisheries, forestry, mining) and the significant tourism sector. Recommendations towards more efficient road solutions,

particularly focussed around the Mt Perry/Gayndah/Biggenden areas will improve the transport efficiency for all the volume commodities exporting through the Port of Bundaberg and cut transport times for a cluster of mine projects in the North Burnett area. Despite the presence of higher volume commodities such as bauxite, ilmenite and coal, rail transportation is not a short term option in the region, and road has been the focus of this report for both mine inputs and outputs. The region is well served with power infrastructure and water – with the latter always a high priority focus of governments at all levels, recognising the major importance agriculture also plays in the region.

The Bundaberg Port is well situated and actively encouraging minerals exports and the necessary imports to sustain the region. Trade throughput has doubled in the past decade through the port which has significantly more tonnage capacity available. The region has also benefitted from the establishment of a State Development Area in 2017 adjacent to the Port of Bundaberg.

2 Geology of the WBB and its influence on mineralisation

The geological history of the Wide Bay Burnett Region, like much of the near coastal area from Newcastle to Bowen, has been a turbulent one, with plate collisions, multiple episodes of volcanic eruption and igneous intrusion, and several periods of plate extension when the plates pulled apart causing the formation of basins. The coastal area from Newcastle to Bowen is generally referred to as the New England Orogen (NEO), and is Australia's youngest orogen.[1] The formation of the Wide Bay Burnett crust is believed to have commenced in the late Devonian around 320 million years ago when the continental coastline comprised part of the supercontinent Gondwana. In some areas, formation of the NEO crust probably commenced earlier in the Silurian some 400 million years ago and formed a converging plate margin with the oceanic crustal plate in the east which was being subducted (forced under) the continental plate.

The history of the NEO, particularly in the Wide Bay Burnett area, has resulted in a particularly complex geology. There are a variety of mineralisation types, from metallic mineralisation in the hardrock of the region, to coal deposits in some of the younger basins, to disseminated mineral sands in the Quaternary dune deposits of Fraser Island, Rainbow Beach, and Cooloola areas. This description (below) of the geology of the region is based on the Geological Survey of Queensland 2012,[2] and other studies as appropriate. Some comments are made on the potential for mineralisation based on the recent interpretation of the geology and contemporary views on mineralisation.

2.1 Structural Framework of the Region and its influence on mineralisation

To understand the complex regional geology it is necessary to review the tectonic history and evolution of the region and the processes that have formed the area and placed the mineral deposits. This history is recorded in the broad structural framework and elements which comprise the region. The pre-Cenozoic (pre 65 million years) structural framework is shown in Figure 3.[3]

[1] Buckman, S 2010, 'Preface', In *NEO 2010*, pviii, University of New England.

[2] Geological Survey of Queensland, 2013, 'The Geology of Queensland', Brisbane, The State of Queensland

[3] Geological Survey of Queensland, (2012) Geology of Queensland and Berkman, DA (1996), The Mining Industry and Mineral Potential of Forested Areas Within the Southeast Queensland Biogeographic Region', Unpublished Report to the Queensland Department of Mines and Energy.

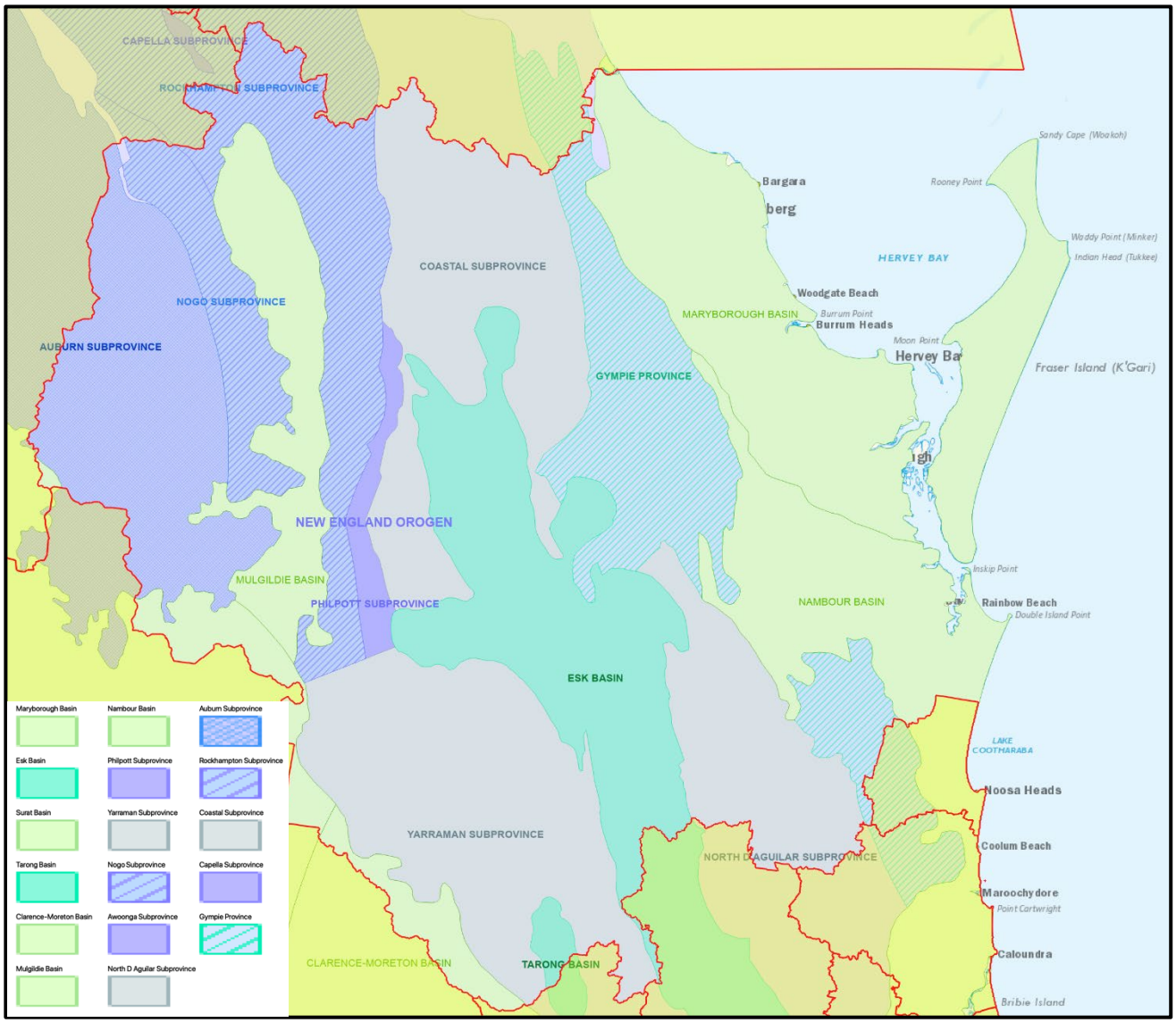


Figure 3: Structural Geological Elements of the Wide Bay Burnett Region created from data supplied by Geological Survey of Queensland.

A simplified account of geological history from Willmott 2014[4] is presented in Figure 4.

[4] Willmott, WF 2014, 'The Rocks and Landscapes of the National Parks of Southern Queensland'. Second Edition Brisbane. Geological Society of Australia, Queensland Division.

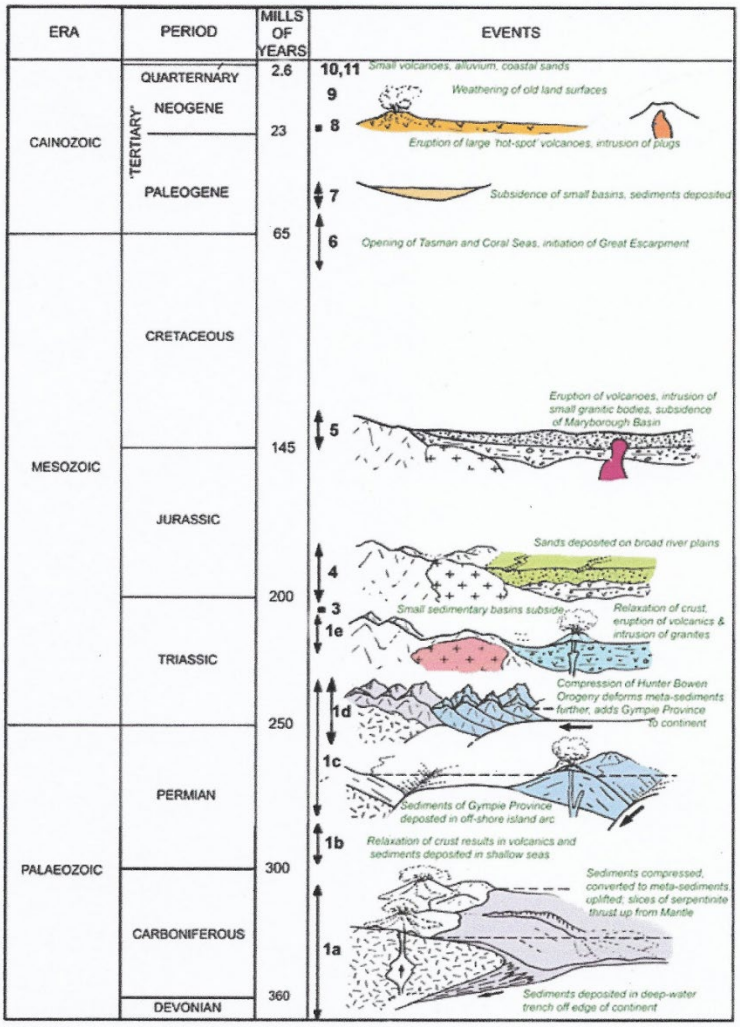


Figure 4: Geological history of events southern coastal Queensland, Willmott 2014

The region comprises five major geological elements or domains, the NEO, the Gympie Province, the Triassic Volcanic Province, the Triassic Coal Basins (Tarong and Esk Basins), and the Triassic Jurassic Basins (Maryborough, Nambour and Mulgildie Basins).

The rocks of the NEO are the oldest in the region and comprise the basement throughout the region, possibly extending eastwards under the younger rocks and the sea to Lord Howe Island.[5] In the earliest part of this period, the Devonian to Carboniferous (370 to 315 million years ago), chains of active volcanoes caused by the collision of the continental and oceanic plates ran parallel to the coastline, feeding volcanic sediments deposited to the east. Around 315 million years ago, these sediments and mountain ranges were deformed and uplifted by a severe compression resulting from the colliding plates, along with deep-seated rocks (serpentinites) from the mantle (Figure 4, Band 1a). These mantle derived serpentinites are enriched in nickel and cobalt representing potential deposits. Subsequently, sedimentary basins formed when the plate movement reversed resulting in extension and subsidence as the plates pulled apart (Figure 4, Band 1b).

The plate collision continued in the Permian period (300 to 250 million years ago). A series of offshore island arcs deposited volcanic sediments interspersed with limestones reefs in what became the Gympie Province, along the edge of the NEO. These sediments were compressed, folded, and uplifted, and the Gympie Province pressed against the NEO becoming part of the continent, (Figure 4, Band 1d) along a major fault boundary. Relaxation of the crust in the Triassic period resulted in subsidence of sedimentary basins, eruption of

[5] Buckman, S 2010, 'Preface', In *NEO 2010*, pviii, University of New England.

volcanoes, and intrusion of granitic rocks (batholiths) (Figure 4, Band 1e). The granitic rocks which intruded the folded volcanic sediments and limestones (Permo-Triassic granitic intrusions 250 to 200 million years ago), are thought to be the source of much of the mineralisation in the region. Most of the metallic mineral deposits are related to the intrusion of the Permo-Triassic granitoids and are associated with small semi-circular intrusions (plutons) which have been exposed by erosion. Large examples include Coalstoun Lakes copper gold, and Mount Cannindah copper deposits. Skarn deposits are believed to have resulted when hot mineralising fluids have contacted the limestones of former reefs.[6]

The Gympie Province is a unique unit comprising Permian and Early Triassic volcanics and metasediments (sediments metamorphosed by heat and pressure). The Triassic Volcanic Province comprises several large areas of terrestrial acid to intermediate volcanics (that is high to intermediate silica/silicon dioxide content) and minor sediment along the northern edge and in the troughs in the NEO. The volcanic activity is younger than the main pulse of granitic intrusion associated with the continental margin of the orogen and volcanic activity associated with the Gympie Province discussed above.

The episode of Triassic volcanic activity is thought to have mineralised the epithermal Mount Rawdon deposit, and the Manumbar, North Arm gold and Kilkivan mercury deposits. Exploration near these existing mines in similar geological settings has the potential for similar style mineralisation.[7]

During the Jurassic period (200 to 145 million years ago), after the subsidence of small sedimentary basins, sands and fine sediments were deposited over broad river plains. These included the Triassic Coal Basins in the study area resulting from depressions that formed in the folded rocks and include the Tarong and Mulgildie Basins and coal deposits therein.

Later, Triassic- Jurassic Basins formed in subsequent depressions and include the Maryborough and Nambour Basins. These contain Jurassic continental sediment, early Cretaceous volcanics and intrusives, and marine and coal measure sediments. There are no important metalliferous deposits in these basins but they do contain coal measures such as the Tiaro and Burrum Coal Measures. The Burrum Coal Measures have been worked previously and are considered to have some further potential for economic mining.

The opening of the Tasman and Coral Seas at the start of the Tertiary period (65 million years ago to 2.6 million years ago) resulted in subsidence of small basins, and deposition of sediments and volcanics onlapping or overlying these major structural elements including the Elliot Formation. The subsidence was accompanied by eruptions and flows from “hot spot “volcanoes and intrusion of plugs. Weathering of old land surfaces resulted in duricrusts,[8] and alluvium and coastal sands were deposited. The duricrusts resulted in the surface enrichment of aluminium oxides and the formation of potential bauxite deposits. Weathering also produced clay deposits of economic significance. The coastal sand masses of Fraser Island, Cooloola and Rainbow Beach, were deposited and windblown, with disseminated heavy mineral sands (rutile, ilmenite, zircon) concentrated into economic deposits. The older sands were leached by rain over time into high purity silica sands such as at Coonarr. The alluvial deposits of the Burnett, Mary and other rivers resulted in sand and gravel for construction, while the recent basalt flows provide a source of crushed aggregates and potentially basalt fibre.

The types of gold and associated copper and polymetallic (molybdenum, cobalt) mineralisation which can arise from igneous activity is shown in the Figure 5 below. Mineralising liquids of molten rock travelling upwards in the weaknesses in the crust are deposited at various levels of the earth’s crust as the fluids cool and precipitate/solidify. If the fluids travel almost to the surface, the minerals may be deposited as irregular quartz veins containing gold (epithermal veins) such as Cracow, or in altered volcanic rocks such as at Mount Rawdon, or as shallow epithermal veins in volcanic rocks as at Mount Carlton in North Queensland.

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[6] Berkman, DA (1996), The Mining Industry and Mineral Potential of Forested Areas Within the Southeast Queensland Biogeographic Region’, Unpublished Report to the Queensland Department of Mines and Energy.

[7] ibid

[8] A hardened surface layer resulting from the weathering of the crust and the migration of the water table.

At deeper levels, the mineralisation may be disseminated in porphyritic (large crystals in fine matrix) rocks such as at Kidston in North Queensland. Gold in this style and depth often occurs with copper and other minerals such as molybdenum. At greater depths and proximal to the parent intrusion, gold mineralisation may be disseminated throughout the granite blob (pluton) such as in Timbarra in northern New South Wales.

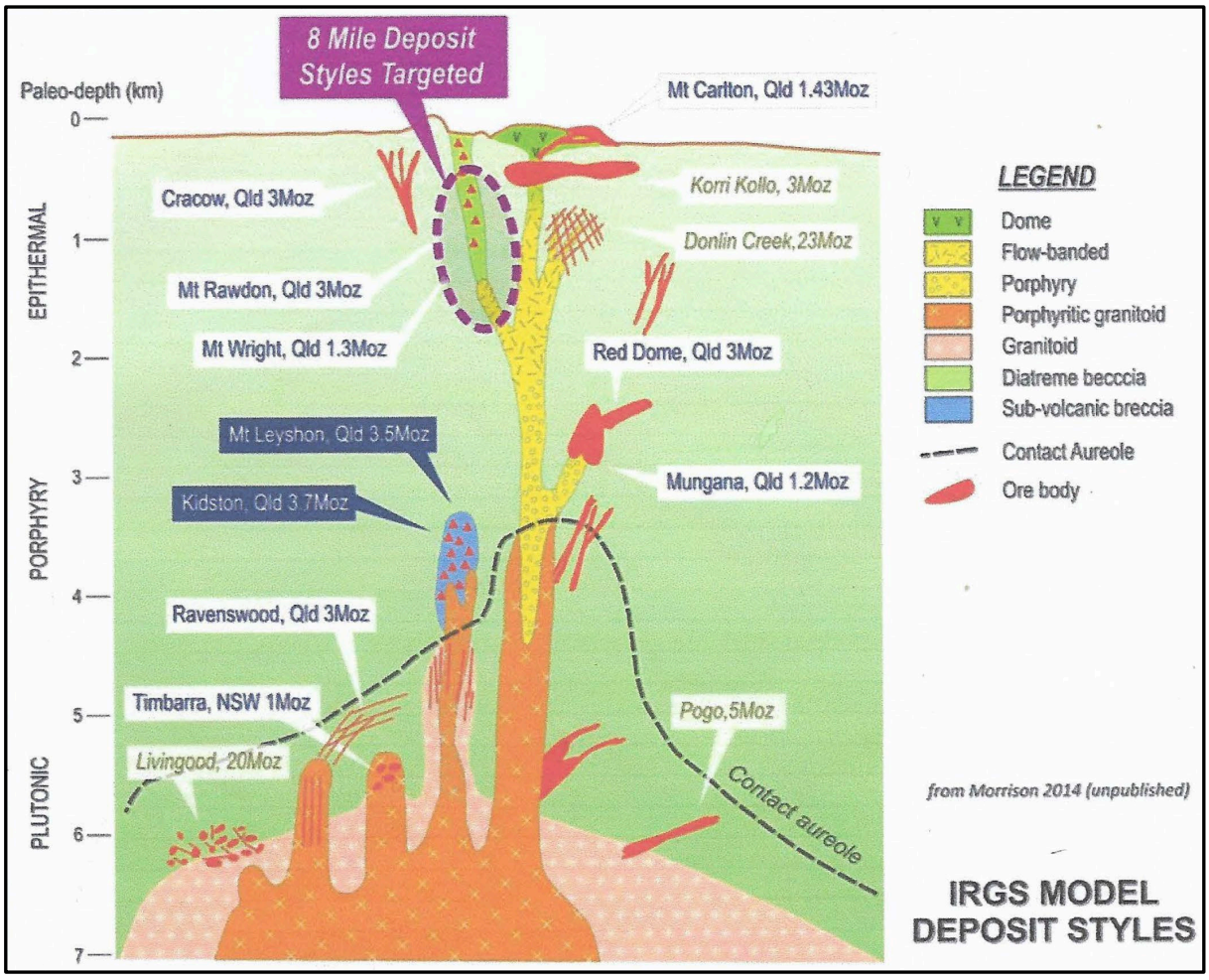

Figure 5: Intrusion related gold systems model.[9]

[9] Metal Bank Limited 2020: 8 Mile Project Maiden Mineral Resource and Exploration Target. ASX Announcement April 2020.

2.2 Geology of the Region and influence on mineralisation.

The regional detailed surface geology for the Wide Bay Burnett Region is shown on Figure 6 and Figure 7 below which has been developed using data from the Statewide Surface Geology layer available through the Queensland Spatial catalogue.

There are approximately 55 geological units present in the Wide Bay Burnett Region making this one of Queenslands most geologically complex areas. The number of units and the complexity has made the area difficult for geologists to understand and explore. The mineral deposits are generally small and of a confused nature. The description of each of the geological units in the region is included in Volume 2 with reference, where available, to mineralisation within the unit.

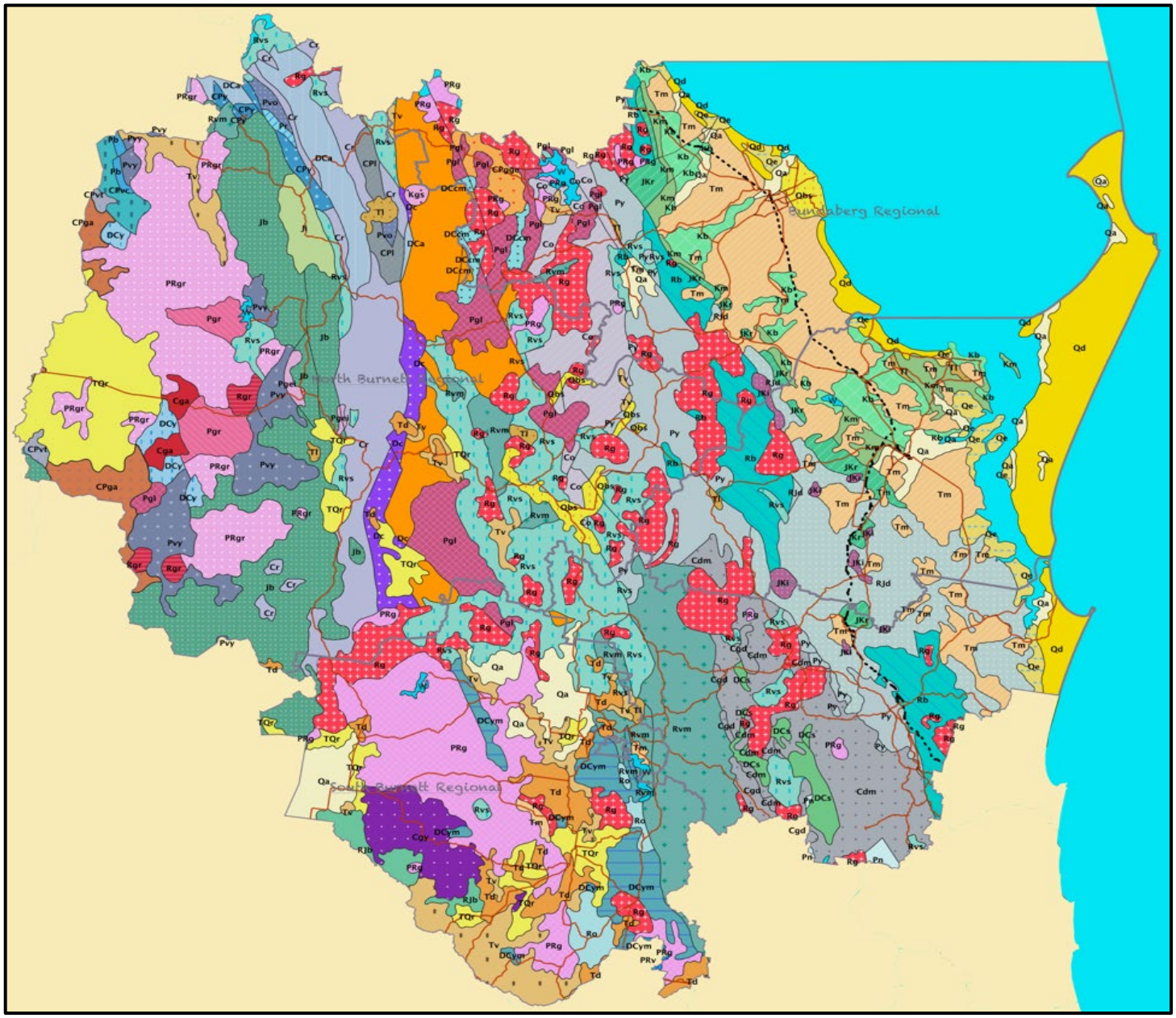

Figure 6: Detailed surface geology for the region.

Figure 7: Legend for Figure 6.

3 Summary of Historic and Current Minerals Exploration and Production

The Wide Bay Burnett Region has a rich mining history. The Gympie goldrush of the 1860s was of particular importance, as it was credited with saving Queensland from bankruptcy. There are hundreds (if not thousands) of historic mine workings in the region with the majority being gold and copper. Historic workings are also found for silver, cobalt, coal, antimony, limestone and stone.

The region currently has several successful mines as well over 200 mining tenements.

Gold

The Wide Bay Burnett Region is home to the historic Gympie Goldfield and numerous smaller historic fields. James Nash found alluvial gold in a tributary of the Mary River in 1867, sparking a gold rush that soon led to finds of extremely rich ore just below the surface. During the first one hundred years of the Gympie Goldfield, the total output was approximately 105,000 kg (3.5 million oz) of gold bullion, making it Queensland's third largest producer. In historic production terms, the goldfield is ranked sixth in Australian hardrock goldfields after Kalgoorlie, Bendigo, Ballarat, Mount Morgan and Charters Towers. The top six mines in the goldfield contributed almost half of the field's total output. These mines included the Scottish Gympie, No. 2 South Great Eastern, South Glanmire and Monkland, No. 1 North Phoenix, North Smithfield and No. 4 North Phoenix.[10] Over this period, it became apparent that the "erratic distribution of gold in the reefs was governed by the composition of the carbonaceous wall rock."

In 1969, Gympie Eldorado Gold Mines (GEGM) Pty Ltd acquired tenements over the goldfields area. From 1969 to 1995, several joint ventures were undertaken with Freeport, BHP Gold Mines and Newcrest culminating in re-commencement of mining in 1995 by which time Gympie Eldorado Gold Mines was owned by Devex. In 1997, the directors of Devex had changed the company name to Gympie Gold Ltd.[11] The company also mined coal at Paxton in NSW (Southland Mine). A fire at the Southland Colliery over the Christmas period 2003 caused a rapid and substantial deterioration in Group's financial position and prospects. The Board of Gympie Gold Limited appointed Voluntary Administrators to the Group on 30 December 2003.

Following their appointment, the Receivers and Managers undertook an appraisal of the situation at the Southland Colliery and the Gympie Eldorado Gold Mine. Immediate steps were taken to address the emergency position that had developed at the Southland mine in conjunction with the operator, Thiess Contractors. Subsequently, the Receivers and Managers offered for sale Gympie Eldorado Gold Mines Pty Limited, or its assets together with its interests in D'Aguilar Gold Limited.

The winning consortium, announced in August 2004, was a new company, Gympie Eldorado Mining Pty Ltd (GEM) formed by Mizuho International Plc, Investec Bank Australia and certain directors and shareholders of Buka Minerals Ltd. In 2005, (post IPO and flotation of Buka Gold) Buka Gold noted difficult operating conditions at the Gympie Mine, and in 2006, concluded that the preferred operating regime would be based on a significantly smaller, but profitable operation targeting smaller tonnages of higher grade material. In 2007, Buka's (then) Executive Chairman, Mr David Hillier, announced a cessation of old minesites and a focus on developing the under explored potential of the Gympie area – "Gympie Eldorado has lacked scale and has carried all the inherent risks of a single project mine which we are seeking to alter with the discovery of higher volume, higher production throughputs that are not merely short-term propositions."[12] The Eldorado gold mine closed in 2008.

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[10] Kitch, RB BHP Gold Mines/Devex Gympie Joint Venture Project and the Geology of the Goldfield, NQ Gold Conference, Townsville, April 1989

[11] On November 28, 1997, Devex changed its name to Gympie Gold Limited. Gympie Gold Limited entered into administration on December 30, 2003, and after various transactions, was recapitalised and relisted on the ASX on April 4, 2006 as Toodyay Resources Limited, which changed its name to Lachlan Star Limited on 17 December 2007 following the acquisition of the Bushranger Exploration Project. The Gympie Gold stable consisted of Gympie Gold Ltd, Southland Mining Ltd, Southland Coal Pty Ltd and Gympie Eldorado Gold Mines Pty Ltd.

[12] Buka Gold Limited ASX announcement, 18 April 2007 "Mine Production Deadline and New Exploration Drive at Gympie Eldorado"

In 2009, Buka Gold announced a significant new discovery of epithermal precious and base metals mineralisation at Mt Scotchy, 25 km north of Gympie, with (then) recent core drilling intercepts including 65.5m at 1.2g/t Au, 17.8g/t Ag.[13] An agreement was reached to sell 80% of the Maryborough Basin Exploration Tenements (including Mt Scotchy) through a wholly owned subsidiary BK Exploration Pty Ltd, to Maub Pty Ltd.[14]

The sale of Gympie Eldorado Gold was completed in 2014. As the Gympie Times noted on 17th Feb 2014, "the century-old mine has been sold by Australian mineral resources explorer Fe Limited to a private Singapore registered mining and metals trading group."[15] This company was Metal Mining Pte Limited of Singapore. In July 2015, one of the mining leases (50114) changed ownership to New Gympie Gold Pty Ltd. In May 2018, Taguda Pte Limited (also a Singapore based company), became the registered owner of the remaining Gympie Eldorado Gold assets, and in July 2019 Esteem Metal Limited of Hong Kong, were cited as the registered owners. This entity currently holds the 100,000 shares in Gympie Eldorado Mining Pty Ltd. Apart from ML 50160 and ML 3772[16], the other mining tenures held by Fe (Gympie Eldorado Mining Pty Ltd) had lapsed by this time, and ML 50114 was and is held by New Gympie Gold Pty Ltd (owned by Aurum Pacific).

Other historic goldfields in the region are summarised at Appendix 1.

Today, the region hosts the successful Mt Rawdon Gold Mine. Evolution has owned and operated Mt Rawdon since November 2011 and in that time has produced over 1.8 million ounces of gold. The Mt Rawdon gold deposit is a massive intrusive-related low grade gold deposit that exhibits excellent characteristics conducive to low cost mining and treatment.[17] It is currently the only operational gold mine in the region, although there are a number of explorers working toward gold, copper/gold, gold/silver and copper/gold/silver mines. Notable are Shamrock who have announced a resource of 450,000 ounces of gold, Mt Cannindah who have announced a resource of 58,000 ounces of gold, and Barambah, and 7B projects, who have announced positive drill intersections.

At least 57 other explorers are working on new and existing goldfields including Coonambula, Mt Elizabeth, Yarrol, Barambah and Mt Steadman.

Copper

Copper was discovered at Mt Perry in 1862. The first reverberatory smelter at Mt Perry commenced production in 1872 and operated until 1884 and then intermittently through to 1914. The area produced 4,830 tonnes of refined copper between 1872 and 1884, and from 1887 to 1914, produced 23,782 tonnes of refined copper, 27,749 ounces of gold, and 793,888 ounces of silver. Mining and processing of the slag dump commenced in 1971, although little evidence of this now remains.

During years of high copper prices, a series of small copper mines and smelters were established in Queensland including Blackall (also known at Great Blackall northwest of Mt Perry), Flanagans, Mount Clara, Mount Coora (now the site of Mt Cobalt) and Teebar. The chimney at the Mt Clara smelter site has been preserved and remains part of Queensland heritage.

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[13] For further detail, see Buka Gold Limited ASX announcement, 17 March 2009.

[14] Per ASX Announcement, 10 November 2009. MAuB Pty Ltd Directors Mr David Hillier (from November 2009) and Mr John Richards (until April 2020, replaced by Mr Patrick McDowell), Mr Joe Singer (from March 2010), Mr Robert Leon (since December 2014).

[15] The Company completed the sale of its wholly owned subsidiary, Gympie Eldorado Mining Pty Ltd (GEM) to a private Singapore registered Mining and Metals trading group company (Purchaser) (Transaction) during the March 2014 quarter. Final payment of $1.425M, being refund of environmental bonds was received on 15 April 2014. Reported in Fe Quarterly Report as at 30 June 2014, found at https://www.felimited.com.au/wp-content/uploads/2017/03/QuarterlyActivitiesandCashflowReport-13.pdf

[16] ML3772 is current until 31/10/2021. ML 50160 lapses 31/7/2020. Both landholdings were recently offered for sale in June 2020.

[17] Alluvial gold was first discovered on the Mt Rawdon hill flanks in 1946 leading to early mining endeavours however the gold grade was too low to be profitable in those times.

There are no current copper producers in the region, however a number of exploration companies are actively targeting copper mineralisation in addition to other minerals.

Mt Cannindah have a copper resource with potential. ActivEX with its Esk and Coulstoun Projects also suggest reasonable copper quantities. BK Exploration are also exploring for copper, as are Dynasty Gold (Kabunga), Hawkwood and Copper Queensland. Amongst many other explorers, AEON Metals Greater Whitewash, 7B, and Ben Hur projects include copper resources.

Silver

Queensland produced 67% of Australia's silver in 2017 and has significant silver deposits. In the Wide Bay Burnett Region, Mt Rawdon is the only current silver producer (in conjunction with gold) and in reported 26,203 ounces of silver for the September 2019 quarter.

Current exploration for silver is in conjunction with gold, or copper and gold within the region. Notable are Mt Cannindah who have delineated a resource of 2.4 million ounces of silver with 58,000 ounces of gold and 50,000 tonnes of copper, Shamrock Tailing who have an inferred resource which includes 265,000 ounces of silver and 450,000 ounces of gold, and Barambah, Red Mountain, Flanagans, and 7B projects, all of which have promising drill intersections for silver.

Antimony

There are three areas in the Wide Bay Burnett that have historically produced antimony. These include the Neardie (Chatsworth) district, about 20 km northeast of Gympie, Glenbar, southwest of Maryborough, and the Eidsvold district.

At Neardie, there were three production mines from 1872 to approximately 1890 during which time it was reported that 1,157 tonnes was produced. In 1906, a further 4.6 tonnes was reported as having been produced, and records indicate 2 tonnes of ore in 1933, and 33.5 tonnes of ore from 1964 to 1969. Antimony mineralisation on the Eidsvold district occurs in the area variously known as Hungry Hill, Silver Ridge and McKonkeys Creek located about 26 km southwest of Eidsvold.

Eidsvold Widbury, Belanda Mt Perry, Johan Hattingh, John Turner and Cheltenham Stone claim to be exploring for antimony among other targets.

Manganese

Manganese has been mined in the Mary Valley since the 1920s. The largest mine on the tenements was at Amamoor No.1 Manganese Deposit (19,630t @ 51% Mn). The mine opened in 1920 and operated intermittently until 1961. A total of 31,477 tonnes of manganese ore has been mined from within the Mary Valley tenements, with manganese grades ranging from 42% to 51% Mn. Limits of the deposit have not been defined either along strike or at depth.

Whilst there are no current manganese mines in the region, Eclipse Metals have an exploration program in the Mary Valley and Amamoor area.

Cobalt

In 1885 W H Rand reported a Cobalt Lode at Black Snake near Kilkivan. In 1944, A K Denmead inspected the workings accompanied by Mr W H Runge. The workings lie on the steep easterly slope of a razorback spur running north from Mt Coora. Mt Coora was previously a copper smelter and mine. It was reported that by observation a good amount of ore had been won, however no returns had been filed. There is no current Cobalt mining in the region, however, a number of explorers have provided positive cobalt results.

In May 2019, Aus Tin Mining provided an update in relation to their Mt Cobalt cobalt-nickel project and noted that they will also examine the results of the 2018 drilling program against the Silver Valley prospect near Black Snake (also located within EPM 19366) located two kilometres south-east of Mt Cobalt.

AEON Metals' 7B project is prospective for cobalt. Auburn Resources has identified nickel-copper-cobalt soil anomalies overlying rocks to the northwest of the Hawkwood station in EPM 25948 and EPM 26245.

Dimension Stone

The Wide Bay Burnett Region currently has three registered mining leases for the purpose of dimension stone. These are Hawkwood Granite, Lochaber Creek, and Gunalda Slate from Anderleigh quarry.

Coal

A report was presented to the Queensland Parliament in 1886 by the (then) Assistant Government Geologist describing the Burrum coal measures and mining activity in the area. At that time, mining was predominantly for the provision of coal to coastal steamers and was centred on the town of Howard.

The region has been explored extensively for coal, and a number of coal measures have been identified. Additional coal areas include Monto (Mulgildie Basin) where thermal coal resources are located, south of Kingaroy near Kunioon where thermal coal resources have been outlined also in the Tarong Basin, the Burrum coal measures (forming part of the Maryborough Formation) where Colton Coal have located a metallurgical coal resource, at Kolan, north of Bundaberg (also part of the Maryborough Formation) where Fox Coal are exploring for metallurgical coal, and near Bauple where thermal coals are being explored in the Tiaro coal measures.

The only currently producing mine is the Meandu Mine in the Tarong Basin which provides thermal coal to the adjacent Tarong Power Station.

Limestone

There are three current limestone producers in the region. Graymont who operate the former Sibelco limestone quarry at Murgon together with the Tamaree lime plant near Gympie, Marule who operate a small agricultural limestone operation north of Bundaberg and Scanford who operate a small limestone mine on their family property.

Kaolin

Kaolin has been mined for a number of years south of Kingaroy and three mines formerly developed and owned by Sibelco. These have recently been transferred to Terrequip Environmental and continue to be a source of kaolin.

Metalsearch and Eidsvold Siltstone are exploring for kaolin to be used as a new economy mineral with ultimate uses such as Halloysite, metakaolin, and high purity alumina (HPA) which is used in the production of high-tech products such as smartphones, tablets, televisions, watches, optical lenses and bio-medical devices.

4 Market Demand Summary

Within the Wide Bay Burnett Region, significant quantities of gold, silver, copper, bismuth, coal, silica sand, stone, limestone, kaolin, manganese and diatomite have been discovered and mined since the 1850s.

4.1 Aluminosilicates

The Wide Bay Burnett Region has several aluminosilicate commodities. These include the feedstocks for HPA, kaolin and zeolites. Aluminium has traditionally been the product used to make HPA for example, although new paths are being forged to manufacture from kaolin. Kaolin is also being investigated for the manufacture of synthetic zeolites.

HPA is a very pure form of aluminium oxide (non-metallurgical alumina Al_2O_3), with a purity level of 99.99% or above. HPA possesses characteristics such as chemical stability, high melting point, high electrical resistance and insulation, and good thermal conductivity, which makes it an ideal choice for engineering applications. Bauxite, which is also plentiful in the region is the traditional feedstock for making aluminium metal. Reports predict demand for HPA is set to escalate and outstrip production due to forecast increases in global electric vehicle adoption.

The global high purity alumina market was valued at $1.1 billion in 2018, and is projected to reach $5.1 billion by 2026, growing at a Compound Annual Growth Rate of 21.7% from 2019 to 2026. In 2018, Asia-Pacific accounted for the major share in the global high purity alumina market, owing to increase in demand for cost-effective and energy-efficient LED lighting across the region as Governments imposed stringent regulations on the production, import, and sale of incandescent lights.

Kaolin, Kaolinite

Kaolinite is an industrial mineral belonging to the group of aluminosilicates. The term kaolin is used to describe a group of relatively common clay minerals dominated by kaolinite and derived primarily from the alteration of alkali feldspar and micas. Kaolin is a platy white industrial mineral used primarily as an inert filler and customers combine it with other raw materials in a wide variety of applications.

Kaolin's commercial attributes primarily revolve around its brightness, whiteness, opacity, gloss, film strength, and viscosity, which translate to a multiple and diversified range of applications. The two largest applications of kaolin are the coating of paper to hide the pulp strands and the production of high-grade ceramic products. Kaolin is also emerging as a cost effective and environmentally friendly source of Alumina and can be applied feedstock in the production of HPA and commercially versatile synthetic zeolites.

Global demand by volume was 30.6 million tonnes in 2017 and is expected grow at a compound annualised growth rate (CAGR) of 4.4% from 2017 to 2025 to reach 43.1 million tonnes by 2025. In 2017, the paper industry was the major consumer of kaolin worldwide, where it is used as a filler or coating, accounting for more than 40% of market share in terms of volume.

Zeolite

Zeolites are a collection of 3-dimensional microporous hydrated aluminosilicate raw materials that have a porous framework and absorption[18] characteristics that render them of commercial value, making them appropriate for employment in petrochemical, detergents, refrigeration, nuclear, concrete, and various other end-user markets. Zeolites have an open boxwork crystal structure through which ions and water molecules can move within the large cavities allowing ionic exchange and reversible rehydration. Zeolites also have very high micro-porosity.

[18] Both adsorbent and absorbent are different physical and chemical processes. Absorbent is the process by which a material absorbs some amount of liquid or gas into it. Adsorbent is a process by which some liquid or gas gets accumulated on the surface of a solid material.

Zeolites are obtained in natural; as well as synthetic form. Natural zeolites are available in abundance; but they provide a restricted range of atomic structures and properties. On the contrary, the synthetic zeolites have a larger range of properties and wider cavities compared to natural zeolites. Therefore, there are a number of zeolites manufactured throughout the globe, annually, to cater to variety of applications. Zeolites are synthesized using inexpensive raw material as compared to silica and alumina sources which include clay minerals, natural zeolites, coal ashes, municipal solid waste incineration ashes, and industrial slags.

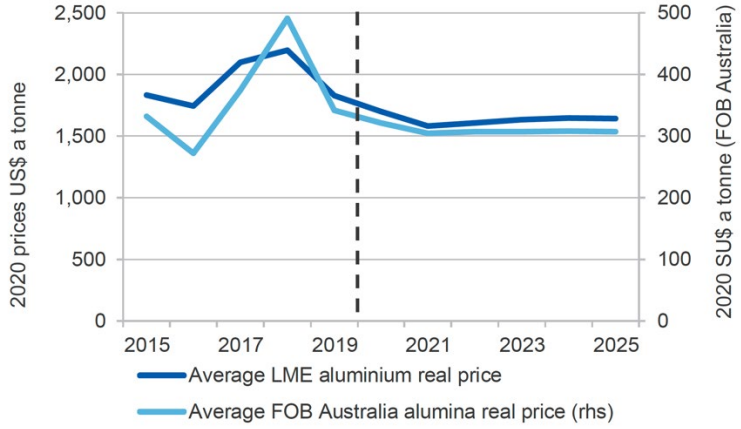
The global zeolite market reached a value of US$ 13.6 Billion in 2018. The market is expected to reach a value of US$ 16.9 Billion by 2024. Within, this parent market synthetic zeolite market represented 40.4% (US$5.4 Billion), exhibiting a CAGR of 3.23% during 2019-2026.[19]

4.2 Bauxite

Bauxite is a complex mixture of aluminium and iron oxides and silicates formed as a result of the weathering of aluminium and iron rich rocks and the redistribution of the minerals by large seasonal fluctuations in the water table. Depending on quality, the ore is used for aluminium production (the metallurgical bauxites) or for production of refractory materials, chemicals or cements (the non-metallurgical bauxites). The main determinant of quality is the silica content; the lower the silica content, the higher the quality.

Australia is the world's largest producer of bauxite accounting for about 30% of global production.

Notwithstanding competition from substitutes for aluminium such as carbon fibre in many products, the medium term future demand for aluminium is positive after 2021. (A temporary slowdown due to COVID may reduce Chinese demand for aluminium in the short run as China accounts for 57% of global aluminium consumption.) Australian Alumina prices are forecast to be approximately US$305 a tonne (FOB) in 2021.



Source: LME (2020) spot prices; Metals Bulletin (2020) Alumina monthly price; Department of Industry, Science, Energy and Resources (2020).

Figure 8: World aluminium and alumina prices.

4.3 Coal

Metallurgical coal differs from thermal coal, which is used for energy and heating, by its carbon content and its caking ability. Caking refers to the coal's ability to be converted into coke, a pure form of carbon used in basic oxygen furnaces. Bituminous coal—generally classified as a metallurgical grade—is harder and blacker and contains more carbon and less moisture and less ash than low-rank coals.[20]

[19] Verified Markets Research 'Global Zeolites Market Size, Status and Forecast to 2026

[20] Bell, Terrence, 15/7/2019, The Balance: What You Should Know About Metallurgical Coal. Found at: https://www.thebalance.com/what-is-metallurgical-coal-2340012

The Wide Bay Burnett Region has three coaliferous basins within its boundaries; the Tarong Basin south of Kingaroy, the Maryborough/Nambour basins in coastal areas from North of Bundaberg to south of Gympie, and the Mulgildie Basin in the Monto area. The coals in the Tarong and Mulgildie basins are thermal coals whilst the coal in the Maryborough Basin achieve coking coal quality.[21]

Coking coal is primarily used in the manufacture of steel. Smaller amounts are also used in cement manufacture, and other industries. Demand for metallurgical coal has increased strongly since the early 2000s, driven by the rapid increase in steel production in China, which became the world's largest steel producer in the early 2000s. Indian demand for metallurgical coal has also increased strongly since the mid 2000s alongside rapid growth in its domestic steel industry, as India has limited domestic reserves of metallurgical coal, demand has been met by imports.

4.4 Cobalt (Co)

Cobalt is considered one of the critical minerals in the transition to renewable energy with the leading use being rechargeable lithium-ion, nickel-cadmium and nickel-metal hydride battery electrodes. Superalloys, used to make parts for gas turbine engines, are another major use for cobalt. Cobalt is also used to make catalysts for the petroleum and chemical industries; cemented carbides (also called hard metals) and diamond tools; corrosion and wear-resistant alloys; drying agents for paints, varnishes and inks; dyes and pigments; ground coats for porcelain enamels; high-speed steels; magnetic recording media; magnets; and steel-belted radial tires.

Austrade has recognised cobalt as having high geological potential in Australia. The long term outlook for cobalt is strong, with growth in demand of products that incorporate cobalt, such as the "new economy" products. By 2025, there are expected to be 10 million electric vehicles (EVs) globally and consumption of cobalt in EVs will reach 70,000 tonnes, versus about 30,000 tonnes now (2020). As an example, changes to China's electric vehicle subsidy rules forced a shift to more cobalt-based batteries for increased energy capacity and, consequently, a scramble to secure stocks by battery manufacturers and original equipment manufacturers.

4.5 Copper (Cu)

Copper is often found in deposits with other metals such as lead, zinc, gold and silver. By far the largest amounts of copper are found in the crust in bodies known as porphyry copper deposits.

Australia has significant reserves of copper, estimated at 87 million tonnes in 2019, approximately 10% of total world reserves.

Copper and copper alloy are flat-rolled sheets of copper and its alloys, which are obtained by various techniques, which includes rolling, hammering, and electrolysis. Copper and copper alloy foils have applications among several industries, of which the electronics[22] and construction industries are the most dominant. The other end users of copper and copper alloy foils include transport, consumer goods, and industrial machinery. Copper sulphate is used as a fungicide to stop plant roots from blocking drains and sewerage systems.

Market Futures Report forecast the Global Copper & Copper Alloy Market is expected to grow with a CAGR of over 6.2% over the next five years.[23] Asia-Pacific is the largest market for copper & copper alloy due to increasing demand in construction in the region, coupled with the growing awareness of the consumers towards portable electronics and its increasing demand across the region. The developing countries such as

[21] Department of Natural Resources and Mines 2003 Queensland Coals Physical and Chemical Properties Colliery and Company information 14th edition Brisbane Qld.

[22] There is about 15 grams of copper in a mobile phone and recently copper has been replacing aluminium in computer chips.

[23] Market Research Futures, September 2019. Global Copper and Copper Alloy Foils Market.

China, India, Japan, South Korea, and other South-East Asian countries are investing heavily towards construction activities, which is likely to fuel the demand for the copper & copper alloy market.

Australian Government forecasts note that while the impacts of COVID-19 are still evolving, falling copper consumption in China has seen price forecasts revised down in 2020 to a spot price average of US$5,990 a tonne. However, over the rest of the outlook period to 2025, rising consumption and constrained production are expected to drive inventories lower and result in a modest recovery in copper prices. Prices are projected to increase at an average rate of 2.0 per cent a year, to reach US$6,900 a tonne by 2025, in real terms.

4.6 Dimension Stone (Building Stone)

Dimension stone can be defined as natural rock material quarried for the purpose of obtaining blocks or slabs that meet specifications as to size (width, length, and thickness) and shape. Dimension stone can be produced from many rock types and sources, but the most important characteristic is the colour and look of the stone which defines its marketability. Colour, grain texture and pattern, and surface finish of the stone are normal requirements. Durability (essentially based on mineral composition and hardness and past performance), strength, and the ability of the stone to take a polish are other important selection criteria. Dimension stone is a material classified under the *Mineral Resources Act 1989* requiring a mining lease to produce.

The value of exports of commodity group 2516 "Granite, porphyry, basalt, sandstone and other monumental or building stone, whether or not roughly trimmed or merely cut, by sawing or otherwise, into blocks or slabs of a rectangular (including square) shape" from Australia totalled $ 4.09 million in 2018. Sales of commodity group 2516 from Australia went up by 0.265% compared to 2017: exports of commodity group 2516 went up by $108,000 (cumulative exports of commodity group 2516 from Australia amounted to $4.08 million in 2017) China was the major recipient of Australian exports, with a share of 74% of those exports, with Indonesia the destination for 19% and Italy with nearly 2%.

The value of imports of commodity group 2516 to Australia totalled $ 2.43 million in 2018. Sales of commodity group 2516 to Australia decreased by 13.8% in value terms compared to 2017 imports of commodity group 2516 decreased by $ 390,000 (the value of imports of commodity group 2516 to Australia was equal to $2.82 million in 2017).[24] 70% of imported stone came from China, India (16%) and Italy (3.44%). From the import/export data above, it could be surmised that Australia exports significant raw stone and imports the finished (value added) retail commodity.

In one of the few reports located on forecast trends in the stone industry, the following information has been provided:

Granite, Marble and Stone market worldwide is projected to grow by 6.8 Trillion Metric Tons, driven by a compounded growth of 4.8%. Granite, Marble and Stone, one of the segments analysed and sized in this study, displays the potential to grow at over 4.8%. The shifting dynamics supporting this growth makes it critical for businesses in this space to keep abreast of the changing pulse of the market. Poised to reach over 24.1 Trillion Metric Tons by the year 2025, Granite, Marble and Stone will bring in healthy gains adding significant momentum to global growth.[25]

[24] Sourced from Trend Economy (February 2020)

[25] For full report, please see https://www.reportlinker.com/p05112908/?utm_source=PRN

4.7 Gold (Au)

Gold is very rare, making up only ~3 parts per billion of the Earth's outer layer. (Imagine 1 billion smarties in one place and only 3 of them were made of gold!) Geologically the Wide Bay Burnett Region is very prospective for gold mineralisation.

Of all the minerals arguably none is more useful (or appreciated) than gold. Whilst jewellery takes up much of the gold production, the most important industrial use of gold is in the manufacture of electronics. A small amount of gold is used in almost every sophisticated electronic device including television sets, cell phones, and computers. Gold has many uses in the production of glass, and continues to be used in medical applications.

Demand for gold has exceeded world mine production for many years and has relied on recycling, sales by investors and, until recently, sales by central banks. However, since early 2010, central banks have become net purchasers of gold to augment their reserves.[26] The World Gold Council has noted that, in particular, the central banks of many emerging nations are maintaining a high percentage of their reserves in gold. The future outlook for gold and thus gold exploration is positive but prices do fluctuate over time, as with most commodities.

Evolution has owned and operated Mt Rawdon since November 2011, producing over 1.8 million ounces of gold since that time. The Mt Rawdon gold deposit is a massive intrusive-related gold deposit that exhibits excellent characteristics conducive to low cost mining and treatment.[27]

4.8 Molybdenum (Mo)

Although a number of molybdenum-bearing minerals have been identified, only one has commercial significance: molybdenite, a natural molybdenum sulphide (MoS_2). Molybdenum has an exceptionally high melting point and is invaluable as an alloy in carbon steel, cast iron and superalloys to enhance strength, toughness and resistance to wear and corrosion. More recently, molybdenum has begun playing a role in renewable energy technology.

A key plus of molybdenum is that a small amount of molybdenum in a product or application can make a significant contribution to its performance. Depending on the alloy, molybdenum can improve strength, hardness, corrosion resistance, weldability and high temperature strength.

Most molybdenum supply is produced as a by-product from the copper mining industry. In 2019, Roskill estimates that 73% was from by-product sources with only 27% of supply coming from primary molybdenum mines.[28] Following a slight recovery in 2018, the molybdenum oxide price declined by 4.1% in 2019, as fears of a trade war between the USA and China hurt market sentiment. Molybdenum forward prices appears to be somewhat difficult to forecast, and the below consensus forecast is a guide only.

[26]Gold Reserves in Australia averaged 78.81 Tonnes from 2000 until 2020, reaching an all time high of 79.90 Tonnes in the first quarter of 2020

[27] Alluvial gold was first discovered on the Mt Rawdon hill flanks in 1946 leading to early mining endeavours however the gold grade was too low to be profitable in those times.

[28] Source: Roskill (2019) Molybdenum Outlook to 2030

MOLYBDENUM *(Nominal, Quarterly Averages)*

US$/lb	Consensus (Mean)	% change from spot	Forecast Range High	Forecast Range Low
Spot price	**12.23**			
Sep 2019	**11.26**	*-7.9%*	12.50	10.00
Dec 2019	**10.98**	*-10.1%*	12.30	9.500
Mar 2020	**10.76**	*-12.0%*	12.06	9.000
Jun 2020	**10.64**	*-13.0%*	12.06	9.000
Sep 2020	**10.38**	*-15.1%*	12.06	9.000
Dec 2020	**10.37**	*-15.1%*	12.06	9.000
Mar 2021	**10.08**	*-17.5%*	12.50	8.000
Jun 2021	**10.97**	*-10.3%*	12.50	9.000

Figure 9: Molybdenum price forecasts.[29]

4.9 Heavy Mineral Sands

The term Heavy Mineral Sands is given to a group of heavy minerals commonly found and mined together from old beach, river or dune environments. Typical minerals extracted from mineral sands include Rutile (TiO_2), Ilmenite ($FeTiO_3$) and Zircon ($ZrSiO_4$).

Pure titanium is quite soft but titanium alloys are extremely strong (even stronger than steel and aluminium). Titanium has a very high melting point and is non-toxic. Titanium dioxide is one of the whitest, brightest substances known.

Almost all rutile and ilmenite is processed into non-toxic white titanium dioxide pigment for use in the manufacture of paints, plastics, paper, ink, rubber, textiles, cosmetics, leather and ceramics. Titanium dioxide pigment has excellent brightness and high opacity for good hiding power (e.g. in paint for covering undercoats) and has replaced lead carbonate pigments. Ilmenite is used as a fluxing agent in blast furnace feeds and as a sand-blasting abrasive. Rutile is used in fibreglass, chemicals and as a coating on welding rods. Rutile is also used to produce light, strong, corrosion-resistant titanium metal for use in aircraft, spacecraft, motor vehicles and desalination plants. Titanium metal is biocompatible with the human body and is thus used for surgical implants such as knee and hip replacements.

Zircon's hardness makes it useful as an abrasive and it has a high melting point (over 2500°C), so it is used in the steel industry, to line furnaces. Zirconium (a derivative of zircon in the form of a silvery grey metal) is extremely hard and resistant to corrosion so is used to make pipes for harsh chemicals, nuclear reactor cladding, heat exchangers and speciality alloys. It is also found in computer disc drives, in lightweight clothing and in many domestic products such as ballpoint pens and wear-resistant knives.

A small, though fast growing component of titanium demand is in the nanomaterials sector where many unique properties of titanium are utilised in such applications as dye-sensitised solar cells, water purification, cancer treatment and noise absorption. The applications for titanium have grown exponentially, from its use (as titanium dioxide) in paints, paper, toothpaste, sunscreen and cosmetics, through to its use as an alloy in biomedical implants and aerospace innovations. Particularly exciting is the perfect marriage between titanium and 3D printing.[30]

Environmental issues have seen the virtual shutdown of coastal operations in many parts of the world. Prices have therefore moved slowly upwards in response to the tight markets as demonstrated in the graph below:

[29] Source: Energy and Metals Consensus Forecasts, June 2019

[30] For further information on this particular aspect, see Laichang Zhang (May 27, 2019), Titanium is the perfect metal to make replacement human body parts, in The Conversation, at https://theconversation.com/titanium-is-the-perfect-metal-to-make-replacement-human-body-parts-115361

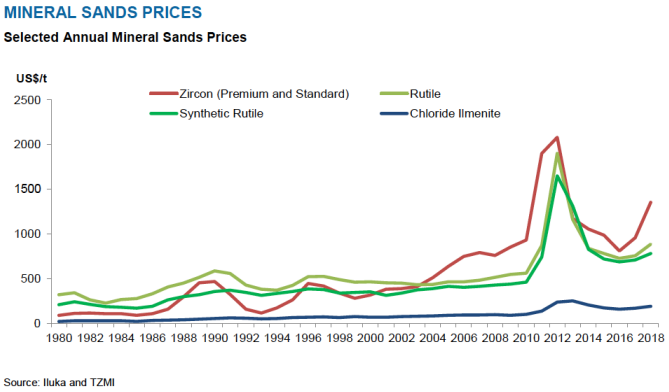


Figure 10: Mineral sands prices.[31]

4.10 Nickel (Ni)

According to Geosciences Australia, Western Australia has the largest nickel resources with 96% of total Australian resources, contained within nickel sulphide and lateritic nickel deposits. Queensland is the second largest with 4.5% lateritic nickel.

In 2018, exports of nickel ore and concentrates (0.164 Million tonnes) and intermediate and refined nickel (0.234 Million tonnes) had a combined export value of $4,285 million significantly up from $2,445 million in 2017 owing to improved nickel prices despite lower production.

Nickel is a key metal in the production of stainless steel which represents 71% of nickel consumption. Industrialization and urbanization in the developing economies are expected to boost the demand for stainless steel in the various end-use industries and thereby for refined nickel. Another 12% goes into superalloys (e.g., Inconel 600) or nonferrous alloys (e.g., cupronickel). Turbine blades, discs and other critical parts of jet engines are fabricated from superalloys. The remaining 23% of consumption is divided between alloy steels, rechargeable batteries, catalysts and other chemicals, coinage, foundry products, and plating.

The increasing demand for nickel in the manufacturing of batteries used in electric vehicles (EVs) is expected to drive the global market growth at a significant rate in the next few years.[32] The growing use of nickel in the healthcare industry in applications such as devices and implants is also expected to fuel the growth of the global refined nickel market.

Fitch Solutions forecasts a growth in Australian production from 2.1 million tonnes to 2.8 million tonnes by 2029. (There may be some minor delays due to COVID constraints.)

4.11 Zinc (Zn)

Zinc is the fourth most-widely consumed metal, following iron, aluminium and copper. Zinc's primary use is for galvanising steel, either through hot dipping or cold plating. Zinc mixed with small amounts of aluminium produces a very strong alloy. Its low melting point enables it to be diecast (cast into different shapes in steel moulds) to make all sorts of items (some requiring fine detail) from carburettors to door handles, staples to zips (and even Matchbox cars!). Brass (70% copper, 30% zinc) is particularly rust-resistant and used in marine hardware.

Zinc is also used in the very common zinc-carbon battery, and zinc-bromide and zinc-nickel power cells are amongst the newest types of batteries. Zinc-bromide is an alternative to lithium ion batteries.

[31] Source: Iluka and TZMI.

[32] According to analytics from GlobalData, the number of electric vehicles is expected to increase from 1.6 million in 2018 to 6.8 million in 2023, and the demand for nickel for lithium-ion batteries is expected to quadruple over this period from 3-4% in 2019.

Zinc oxide is used in the manufacture of rubber tyres, skin products (such as zinc cream, antiseptic ointments and calamine lotion for healing skin disorders), paints, floor coverings, plastics (to help prevent them cracking) and ceramic glazes.

Global zinc consumption is projected by Australian Geosciences to rise modestly over the period to 2025, from 14 million to 15 million tonnes. Mine supply is set to increase whilst smelter capacity remains limited suggesting rationalisation of concentrate supply may be required in the absence of investment in additional smelting capacity. As exploration for copper continues in response to demand for battery materials, the outlook for zinc may also benefit. Fitch see global zinc production increasing to 15.7 million tonnes by 2028, averaging a year on year growth of 1.97 per cent.

5 Project Matrix

5.1 Introduction to the Matrix

An exploration permit allows for prospecting, conducting of geophysical surveys, drilling, and sampling and testing of materials.

An MDL allows for further studies of a resource and to assess the development potential of a site, once it has been determined that minerals or coal exist in the resource authority (EPM/C) area. In addition to activities allowed under exploration resource authorities for coal or minerals, proponents may:

- conduct feasibility studies, geoscientific programs (for example drilling, seismic surveys), metallurgical testing and environmental studies;
- carry out engineering design studies, and
- carry out marketing, environmental, engineering and design studies to evaluate the development potential of the defined resource. This can include test/sample pits.

The highest form of mining tenure is a mining lease (ML). MLs are granted for the mining of minerals or coal but may also be granted for associated purposes such as infrastructure to support mining operations, a mining camp or a tailings dam, processing facilities, workshops, stockpiles, water storage devices, treatment plants, storage sheds, explosive magazines and rehabilitation and remediation associated with these activities.

As part of obtaining a mining tenure, a proponent must meet the Government's criteria which include:

- An environmental authority relevant for the activities to be undertaken. A mining tenure cannot be granted in the absence of the appropriate environmental authority
- Meeting all Native Title requirements pursuant to the *Native Title (Queensland) Act 1993* (on land where native title has not been extinguished)
- Financial and technical capability to undertake the planned activities and sufficient funding for rehabilitation etc. As part of a resource authority application, proponents are required to pay a security deposit to be used as surety against the cost of rectifying any damage caused and to cover unpaid royalty, rent, penalties or liabilities) and financial provisioning (to cover the likely costs and expenses to prevent or minimise environmental harm or rehabilitate or restore the environment).[33]
- Development plans and work programs, the scope of which varies according to the tenure and on the size and complexity of the proposed operation, and
- Adherence to a multitude of laws/regulations etc – such as (for example), *Coal Mining Safety and Health Act 1999* or *Mining and Quarrying Safety and Health Act 1999*, *Explosives Act 1999*, *Radiation Safety Act 1999*, *Nature Conservation Act 1992 (in particular S27)*, *Water Act 2000 (Qld)*, *Environmental Protection Act 1994 (Qld)*, etc.

In light of the criteria prescribed by the Queensland Government, the technical and financial veracity of tenure holders is assumed as established through receipt of the relevant tenure. As proponents move through from EPC/M to Mining Lease, the thresholds of requirements for environmental approvals increase, native title and other land titles must be addressed and where appropriate compensation provided for. The granting of a mining tenement by the Government means that the required social, land and environmental criteria have been addressed.

[33] Mineral and Energy Resources (Financial Provisioning) Act 2018

The criteria used in this report include:

- **Resource/Mineralisation**

  The location, quantity, grade (or quality), continuity and other geological characteristics of a resource are known, estimated or interpreted from specific geological evidence and knowledge, including sampling. Identified JORC resources are critical for this category. Proponents rely heavily on JORC Statements to understand future potential resources which are often used to borrow/invest against. Mineral resources are divided, in order of increasing geological confidence, into Inferred, Indicated and Measured categories. All JORC reports of Mineral Resources must satisfy the requirement that there are reasonable prospects for eventual economic extraction (ie more likely than not), regardless of the classification of the resource.

- **Electricity/Power**
- **Water**
- **Transport**

  Exploration/Mining inputs are often brought in by a combination of transport options to the site. The current road/rail infrastructure within the Wide Bay Burnett is presented at Figure 11 (below). This figure shows the North Coast Rail Line (in black) as well as the disused Mungyar Junction (near Maryborough) - Monto - Gladstone railway and the Bundaberg Mt Perry railway (both in red). Until there is sufficient product to move from the west of the region, and major rebuilding of the closed railways (or building of new rail lines), all freight will continue by road.

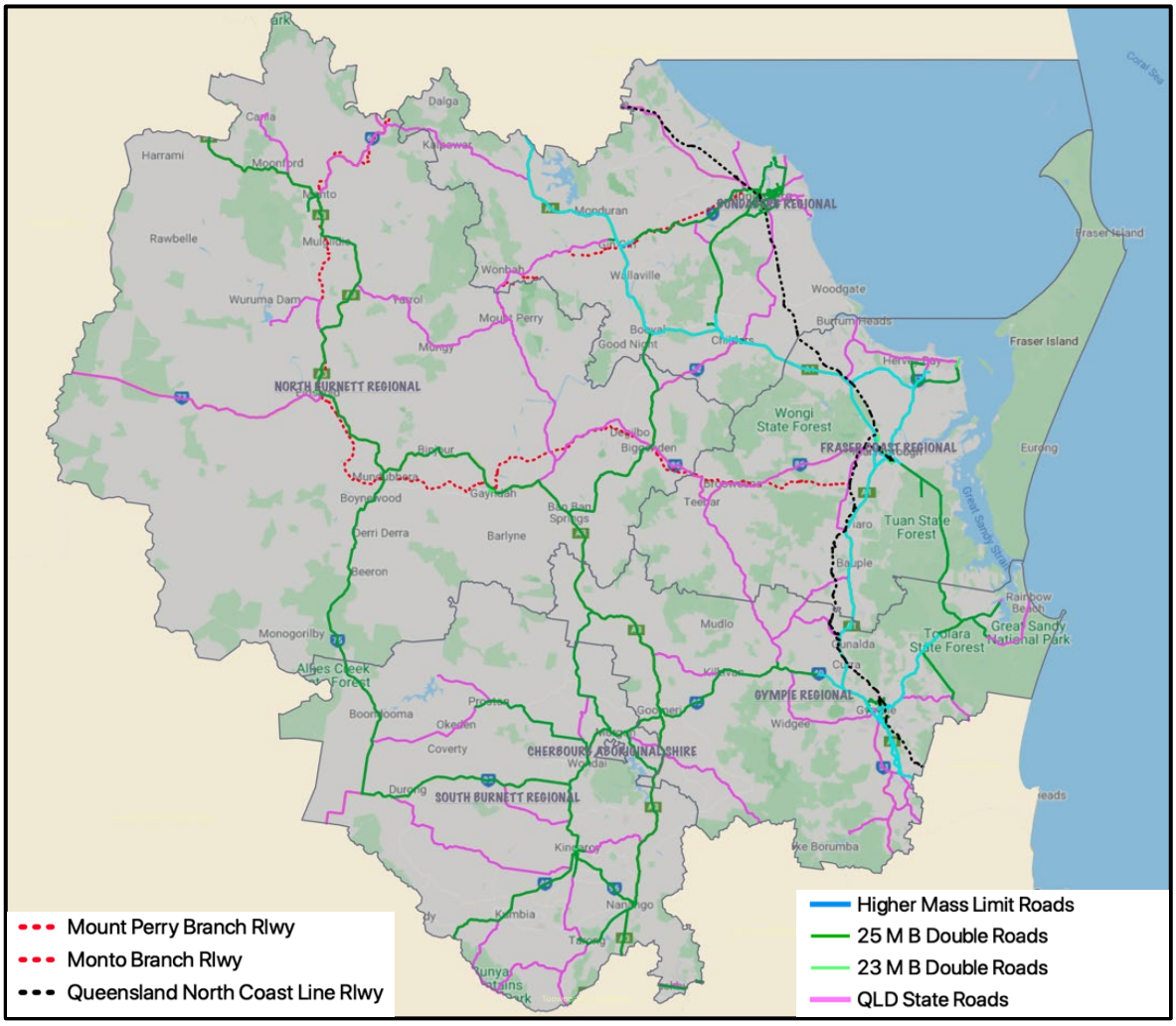


Figure 11: Wide Bay Burnett: Main Road and Rail Routes

Transport can represent significant cost to a project. High volume low value products such as iron ore, bauxite and coal are far more sensitive to freight costs as they are often freighted in significant quantities. Using analysis of coal transportation costs in Eastern Australia, NERA[34] noted that transportation both by land and sea, is a key strength for the Australian coal industry. Quality infrastructure and comparatively short distances to key markets place Australia among the world's best in this phase of the value chain. Yet, despite this observation, the transportation of coal is a significant cost factor for industry operators, representing 25% to 40% of the cost for seaborne coal.[35]

- **Market Demand**

  Consumption trends for minerals and metals change over time. New and evolving technologies are driving changing patterns in manufacturing for example: battery technology/solar/Electric Vehicles. Changing patterns in manufacturing are also changing patterns of demand for minerals and metals. Bauxite is an example where bauxites which were not compatible with the low temperature Bayer process, are now finding a market due to the development of different processes for the manufacture of aluminium.

  Prices, along with exchange rates, input charges (transport, energy, regulatory fees/charges, royalties and taxation, can all impact on the relative competitiveness of commodities from a region.

In addition to the above criteria, an available labour supply, with the right skills is also required. Support services such as education facilities, medical services/hospitals and recreational facilities are also necessary to retain employees (and their families). Support also includes training and development opportunities for staff and families.

Accommodation availability and pricing/quality also impact on the relative competitiveness of a region and its businesses for labour.

The Wide Bay Burnett Region has surplus labour resources and its regional centres are well served with education (including tertiary options), medical, recreation and all support services, including manufacturing facilities.

5.2 Matrix of Projects

The table below summarises the 18 exploration and 11 development projects. Appendix 2 to Volume 1 contains a summary of each Project which has been agreed with the proponent.

[34] National Energy Resources Australia (NERA), December 2016, Coal Industry Competitiveness Assessment, Australian Government.
[35] Wood McKenzie and Metalytics, (2015) cited in NERA, ibid.

Company	Project and Status	Mineral Resource including potential scale	Transport and logistics	Power	Water availability	Target markets	Investment Required/ Readiness
Exploration Projects							
Aus Tin Mining – Listed (ASX:ANW)	**Mt Cobalt Project.** (Exploration) Promising drill results. Maiden JORC not yet available. **Pembroke Project**. (Exploration) Early positive drilling results.	Mt Cobalt Project: High grade mineralisation approximately 130m along strike. Current target zone 350m long x 25m wide and open at depth and down dip to the west. Pembroke Project: New zones of nickel-copper associated sulphide mineralisation including zones of what appears to be radial fracture hosted mineralisation.	The Wide Bay Highway (B Double route) is within 25 km of the project. The distance to Bundaberg Port via heavy vehicle routes is 240 km from Kilkivan.	132 kV and 66 kV available at Kilkivan and Woolooga within 25 km of the Project.	To be considered as part of mining lease development.	On a global basis, the leading use of cobalt is in rechargeable lithium-ion, nickel-cadmium and nickel-metal hydride battery electrodes. Nickel is a key metal in the production of stainless steel, as it enhances the corrosion resistance properties of steel thereby adding high value to the end product representing 71% of Nickel consumption.	Next stage investment includes completion of geophysics survey (ground penetrating radar) and drilling ahead of resource definition. Pilot scale beneficiation work also required. Company owns freehold property at Mt Cobalt so work can be undertaken relatively quickly.
Pennant Resources P/L Auburn Resources Ltd (unlisted) (DGR parent is listed)	**Ban Ban Project**. (Exploration)	Defined resource of 214,000 t at 8% Zinc. Further work proposed to substantially increase the resource.	Approximately 180 km to Bundaberg Port via truck (B Double) route.	Approximately 20 km to 66 kV power line	To be considered as part of Mining Lease development.	Zinc is used extensively in galvanising steel. The Global steel market continues to grow by approximately 18m tonnes pa whilst zinc is also a primary commodity the rapidly growing battery market.	Auburn Resources has been flagged by DGR Global for future listing.
Auburn Resources (unlisted) (45% owned – DGR Global ASX: DGR)	**Hawkwood Project.** (Exploration)	Prospective for nickel, cobalt, copper and platinum. VTEM and Magnetics geophysical survey undertaken. To be followed up with MLEM and drilling of identified prospects.	Project is approximately 50 km southeast of Mundubbera which is the closest heavy transport route which would provide B Double access.	Eidsvold and Mundubbera substations provide closest 66 kV power. Both are approximately 50 km away.	To be considered as part of Mining Lease development.	The traditional but growing high strength steel market and the burgeoning battery market, particularly nickel and cobalt containing batteries used in EVs.	Auburn Resources has been flagged by DGR Global for future listing.

Company	Project and Status	Mineral Resource including potential scale	Transport and logistics	Power	Water availability	Target markets	Investment Required/ Readiness
AEON Metals (ASX:AML)	**Ben Hur Project.** (Exploration)	Ben Hur JORC compliant l Resource of 190,000 tonnes of copper, 2,700,000 ounces of silver and 16,665,000lbs of molybdenum.	Project is within 15 km of heavy transport route, and approximately 160 km from Gladstone Port.	19.1 kV and 66 kV power available in immediate area.	To be considered as part of Mining Lease development.	Copper market is primarily Asian copper refiners. Silver demand is increasing due to its use in medical, battery, PV panels. and as currency hedge. Molybdenum demand is from Asian manufacturers of stainless steel, electronics and renewables industries.	
AEON Metals (ASX:AML)	**7B Project.** (Exploration)	Numerous mineralised intersections of copper gold, molybdenite and zinc. JORC resource to be defined. Intersections range up to 4.92% copper, 4.79g/t gold 68 g/t silver and 2.47% zinc.	As above.	19.1 kV power is available in the immediate area, and 66 kV is approximately 10 km distant.	To be considered as part of Mining Lease development.	Copper market is primarily Asian copper refiners. Demand for gold has exceeded world mine production for many years. Given current prices, the future outlook for gold and thus gold exploration is positive. Molybdenum to Asian manufacturers of stainless steel, electronics and renewables.	
AEON Metals (ASX:AML)	**Greater Whitewash.** (Exploration)	JORC Resource copper, molybdenum, as well non JORC Tungsten of 242 Mt@604ppm (O.06%) Molybdenum Equivalent. 138 Million pounds of Molybdenum, 284,000 tonnes of copper and 12 Million ounces of silver.	As above.	66kV power is available within 10 km of project.	To be considered as part of Mining Lease development.	Molybdenum for Asian stainless steel, electronics and renewables industries Copper market is primarily Asian copper refiners. Silver demand is increasing due to its use in medical, battery, PV panels and as a currency hedge.	

Company	Project and Status	Mineral Resource including potential scale	Transport and logistics	Power	Water availability	Target markets	Investment Required/ Readiness
ActivEX Pty Ltd (ASX:AIV)	**Barambah Project.** (Exploration)	Small gold resource of 363Kt @ 1.47g/t Au and 61.8g/t Ag (for 17.2 thousand ounces Au and 722 thousand ounces Ag of contained metal).	Close to Burnett Highway and heavy transport routes to both Brisbane and Bundaberg.	11 kV power within 5 km and 66 kV power within 25 km of the project.	To be considered as part of Mining Lease development.	Demand for gold has exceeded world mine production for many years. Given current prices, the future outlook for gold and thus gold exploration is positive. Silver for use in medical, battery, PV panels, and as currency hedge.	The Company is currently reviewing funding options to advance the project with 2020 surficial geochemical and geological mapping exploration to be funded internally.
ActivEX Pty Ltd (ASX:AIV)	**Esk Project.** (Exploration)	Promising intersections from White Horse prospect of. 12m @ 0.9% Cu and 0.1g/t Au from 29m at this stage.	Close to heavy transport routes to Brisbane and Bundaberg.	11 kV power within 5 km and 66 kV power within 25 km of the project.	To be considered as part of Mining Lease development.	Copper market is primarily Asian copper refiners. Demand for gold has exceeded world mine production for many years. Given current prices, the future outlook for gold and thus gold exploration is positive.	The Company is currently reviewing funding options to advance the project with 2020 surficial geochemical and geological mapping exploration to be funded internally.
ActivEX Pty Ltd (ASX:AIV)	**Coalstoun Lakes.** (Exploration)	Inferred copper resource of 26.9Mt @0.38%Cu (for 102,700tonnes) of contained copper, with identified areas of potentially higher grade supergene enrichment.	Close to Burnett Highway and heavy transport routes to both Brisbane and Bundaberg.	11 kV power within 5 km and 66 kV power within 25 km of the project.	To be considered as part of Mining Lease development.	Copper market, primarily Asian copper refiners.	Activex is currently reviewing funding options for the Coalstoun project and possible deeper core drilling of the porphyry system.

Company	Project and Status	Mineral Resource including potential scale	Transport and logistics	Power	Water availability	Target markets	Investment Required/ Readiness
Roar Resources. MetalBank (ASX:MBK)	**8 Mile Project.** (Exploration)	Maiden resources of 195,000 t at 2.4 g/t gold.	General access roads nearby.	11 kV power available within the EPM.	To be considered as part of Mining Lease development.	Demand for gold has exceeded world mine production for many years. Given current prices, the future outlook for gold and thus gold exploration is positive.	MBK completed fund raising activities in early August to fund the next phase of drilling targeting the location of a potential bulk tonnage intrusion at the 8 Mile project. Drilling is expected to commence in Q3 of 2020.
Roar Resources. MetalBank (ASX:MBK)	**Eidsvold Gold.** (Exploration)	Drilling proposed based on 3D modelling of the intrusion related gold system and promising scout drilling. Recent Government grant will enable further exploration of copper, silver, molybdenum, lead, tellurium and zinc targets.	Heavy transport routes available in the area.	66 kV and 11 kV power nearby.	To be considered as part of Mining Lease development.	Demand for gold has exceeded world mine production for many years. Given current prices, the future outlook for gold and thus gold exploration is positive. MBK targeting Molybdenum for use in engine parts, and tellurium, a metal used to improve the strength of lead, copper and stainless steel.	MBK completed fund raising activities in early August to fund the next phase of drilling targeting the Great Eastern Target and periphery target areas. Drilling is expected to commence in Q4 of 2020.
Cannindah Resources	**Mt Cannindah.** (Exploration)	JORC Resource. 5.5Mt @ 0.92% Cu, 0.34g/t Au and 14.9g/t Ag Significantly more scale with further targeted exploration.	Adjacent to Gladstone Monto Rd. No heavy transport route in the vicinity.	66kV line within 2 km of site.	Water resources part of the mining lease application process.	Copper market is primarily Asian copper refiners. Demand for gold has exceeded world mine production for many years. Given current prices, the future outlook for gold and thus gold exploration is positive. Silver demand is increasing due to its use in medical, battery, PV panels. It is also used as currency hedge.	$5 million to complete more detailed exploration of the gold system and increase the current known resource.

Company	Project and Status	Mineral Resource including potential scale	Transport and logistics	Power	Water availability	Target markets	Investment Required/ Readiness
BK Exploration and MAuB Pty Ltd Private company	**Maryborough Project.** (Exploration)	Mount Scotchy Gold silver and other sulphides in 16 holes with best results: - 65.5m @ 1.2g/t Au, 17.8g/t Ag, 0.1% Pb, 0.2% Zn and 0.3% As, including 1.8m @ 6.6g/t Au and 1.70m @ 6.3g/t Au, 35.9g/t Ag - 0.43m at 9.5g/t Au - 0.43m at 452g/t Ag - 0.73m at 15.2% Zn - 0.71m at 6.9% Pb. Mt Elizabeth - 217m at 1000 ppm Cu, 43ppm Mo - 202m at 900 ppm Cu, 44ppm Mo - 400m at 800 ppm Cu, 50ppm Mo - 0.3m at 1.95% Cu - 2.0m at 0.35% Cu. Cherry Creek - 5m @ 0.32 g/t Au, 0.61 g/t Ag at end of hole with As-Bi-Hg-Se trace element support.	Near Bruce Highway, North Coast Railway.	Abundant power infrastructure in the near vicinity.	To be considered as part of Mining Lease development.	Demand for gold has exceeded world mine production for many years. Given current prices, the future outlook for gold and gold exploration is positive. Silver demand is increasing due to its use in medical, battery and particularly PV (solar) panels. Copper market is primarily Asian copper refiners for industrial applications and increasing electric vehicle requirements.	Active team ready to expand drilling on identified targets. Financial and operating partners sought.

Company	Project and Status	Mineral Resource including potential scale	Transport and logistics	Power	Water availability	Target markets	Investment Required/ Readiness
Black Dragon Energy Zenith Minerals Limited (ASX:ZNC)	**Red Mountain Project.** (Exploration)	13m @ 8.0 g/t Au incl 6m @ 16.7 g/t Au from surface. 5m @ 3.5 g/t Au & 54.3g/t Ag incl 2m @ 8.0 g/t Au & 109.4 g/t Ag from 64 m depth. 12m @ 1.0 g/t Au from 42m depth including 4m @ 2.1 g/t Au from 50 m depth.	Red Mountain is situated approximately 220 km from Gladstone.	19.1 kV power available in the area of the EPM.	To be considered as part of Mining Lease development.	Demand for gold has exceeded world mine production for many years. Given current prices, the future outlook for gold and thus gold exploration is positive.	Zenith Minerals Limited is listed on the Australian Securities Exchange, investors may invest directly into the Company via the purchase of publicly traded shares.
Black Dragon Energy Zenith Minerals Limited (ASX:ZNC)	**Flanagans Project.** (Exploration)	Strong gold rock chips results including: 20 g/t Au, 12.0 g/t Au, 11.5 g/t Au, 5.25 g/t Au, 3.3 g/t Au, 3.2 g/t Au, 2.6 g/t Au and silver to 70 g/t Ag.	Red Mountain is situated approximately 220 km from Gladstone.	19.1 kV power available in the area of the EPM.	To be considered as part of Mining Lease development.	Demand for gold has exceeded world mine production for many years. Given current prices, the future outlook for gold and thus gold exploration is positive. Silver demand is increasing due to its use in medical, battery, PV panels (it is most reflective material on earth). It is also used as currency hedge.	Zenith Minerals Limited is listed on the Australian Securities Exchange, investors may invest directly into the Company via the purchase of publicly traded shares.
DGR Global	**Shamrock Tailings Project.** (Exploration)	Indicated: 770,000 tonnes @ 0.58 g/t Au for 450,000 grams (14,000 ounces) gold; and Inferred: 770,000 tonnes @ 11 g/t Ag for 8,242,400 grams (265,000 ounces) silver.	Gold does not require significant transport options for product, however for inputs, it is usefully located 10km near the Wide Bay Highway (B double route).	66 kV power available within 10 km of site. 11 kV power available at site.	Tailings Dam may provide necessary water.	Demand for gold has exceeded world mine production for many years. In addition, since early 2010, central banks have become net purchasers of gold to augment their reserves. Given current prices, the future outlook for gold and thus gold exploration is positive.	

Company	Project and Status	Mineral Resource including potential scale	Transport and logistics	Power	Water availability	Target markets	Investment Required/ Readiness
IronRidge Resources (LSE:IRR)	**Monogorilby Project.** (Exploration)	JORC resource 54.9 Mt of bauxite with total aluminium content of 37.5 % Al and 8.5% total Silica.	Site is within 10 km of Heavy transport (B Double) route. Approximately 280 km to Port of Bundaberg.	19.1 kV power available near site.	To be considered as part of Mining Lease development.	Notwithstanding competition from substitutes for aluminium such as carbon fibre in many products, the medium term future demand for aluminium is positive after 2021.[36]	Investment sought. (JV, Farm in/out, Outright sale) and future offtake.
Development Projects							
High Titanium Limited – private company	**Wateranga Project.** (Development) Mining Lease in place. Initial 15 year mine life; total project life up to 40 years	Ilmenite – 150,000 tpa increasing to 600,000 tpa JORC resource of 204 million tonnes, with a recovered grade of 5% Ilmenite, 20% High Alumina Feldspar, 0.8% Apatite and 30 parts per million Scandium.	Road via Biggenden to Bundaberg Port (227km one way).	Diesel gen or 66kV line 6.25 km away.	Yes (800Ml p/a).	Almost all ilmenite and rutile is processed into non-toxic white titanium dioxide pigment for use in the manufacture of paints, plastics, paper, ink, rubber, textiles, cosmetics, leather and ceramics.	Seeking up to $30 million further investment in this advanced project.
Australian Bauxite – listed ASX:ABX	**Binjour Project.** (Development) JORC resource 22.8 Mt Indicated and 14.2 Mt Inferred **Toondoon Project.** (Development) Mining Lease in place but may be a swing-producer. JORC Resource 3.4 Mt Inferred.	Bauxite – 300,000 tonnes in year 1 increasing to 1 Mtpa in year 5.	Binjour – Road (B Double route) via Gayndah and Biggenden to Bundaberg Port (200 km one way). Toondoon - Road (B Double route) via Munduberra, Binjour, Gayndah and Biggenden to Bundaberg Port (256 km one way).	Binjour - 66kV line 5km away. Project will be off-grid. Toondoon – 66 kV line approximately 18km away at Munduberra.	Burnett River within 10 km. River water is not required.	Binjour – Direct shipping bauxite suitable for Tianshin's new low temperature refinery due for completion in 2021. Toondoon – bauxite suitable for metallurgical, cement, and fertiliser markets.	Funding is secured subject to the economic impact from the COVID-19 pandemic on the demand for bauxite. Project has been delayed by travel restrictions in 2020 and economic impacts from delayed bauxite sales. Investment from an end-user customer is sought to increase confidence of sales continuity.

[36] A temporary slowdown due to COVID may reduce Chinese demand for aluminium in the short run as China accounts for 57% of global aluminium consumption.

Company	Project and Status	Mineral Resource including potential scale	Transport and logistics	Power	Water availability	Target markets	Investment Required/ Readiness
Abercorn Kaolin Pty Ltd Metalsearch ASX:MSE	**Abercorn Project.** (Development) Total Maiden Resource for the Abercorn Project area is 39.06Mt yielding 36.8% -20µm grading 28.6% Al_2O_3 & 1.18% K_2O, using a cut-off grade of 26% Al_2O_3.	Kaolin. The project development is underway. The maiden JORC which represents less than 10% of the total tenement holdings includes A high-grade section within the Project area called the Railcut Prospect contains 14Mt yielding 38% -20µm fraction grading 30.26% Al_2O_3 & 0.89% K_2O, using a cut-off grade of +29% Al_2O_3.	Road. The Cynthia project is close to the Burnett Highway B Double approved route. The distance to Bundaberg Port via approved heavy vehicle routes is 290 km.	66 kV line approximately 25km away at Eidsvold substation. 11kV is available locally at Abercorn.	Possible water sources in the east from Burnett River and west from Nogo River and Wuruna Dam. In addition, Potential ground water source.	Target markets are under investigation and may include for example, suitable kaolin based industrial mineral products and DSO potential. In addition, kaolin mineral resources presents as high quality feedstocks for HPA, and synthetic zeolite.	Abercorn Project (mineral): Metalsearch is currently evaluating the development of the Abercorn Project for a high-grade kaolin mineral exporting operation. Opportunities exist for joint venture project and/or potential off-take partners. Zeolite (mineral processing technology): Technical collaboration, co-investment and partnerships with specialist industry groups or Investment Funds. Innovative mining companies open to downstream integration of commercial remediation solution that consumes suitable mine tails/residues to produce high value zeolites – potentially improving project margins, whilst reducing environmental footprint. Alternatively, Funds wanting to co-invest in a novel and proprietary zeolite mineral processing technology that offers an innovative environmental edge and delivers improved commercial outcomes to the mining sector.

Company	Project and Status	Mineral Resource including potential scale	Transport and logistics	Power	Water availability	Target markets	Investment Required/ Readiness
Terrequip Environmental Pty Ltd Private company	**Goodger** mine under rehabilitation. **Nyora and Winters** available for production. (Development)	Small to medium scale kaolin mining.	Close to heavy transport routes.	11kV Connected.	Sufficient water available for leases.	Kaolin clays for the production of ceramics, bricks and pavers, fillings and coatings for the paper industry.	
Fox Coal Pty Ltd. Parent Fox Resources Pty Ltd (ASX:FXR)	**Bundaberg Project** (Development)	Indicated Resource 64.3 Mt coking coal Inferred Resource of 83Mt coking coal. Exploration target 5-35 Mt.	Adjacent to North Coast Railway, and Bruce Highway providing road access to Bundaberg Port and rail access to Gladstone Port.	High voltage power readily available.	To be considered as part of Mining Lease development.	Demand for metallurgical coal has increased strongly since the early 2000s, driven by the rapid increase in steel production in China.	Investment opportunity available.
Eidsvold Siltstone Pty Ltd – private company	**Lochaber Creek project.** **(Development)** Mining leases granted and worked plus wider exploration permit granted.	Large EPM27461 encompassing the mining leases recently granted to further develop resources. Another Exploration Permit Application has been lodged near Langley Creek some 30 kms to the north of Eidsvold bringing total resource estimations to around 20 million tonnes.	The mine is located at Lochaber Creek adjacent to the Burnett Highway heavy vehicle route south of Eidsvold providing B Double access north and south.	11 kV and 66 kV available in the area.	Water for operational use is currently in place for the existing operation at Eidsvold Siltstone's processing facility in the Industrial Area of Eidsvold township.	High quality white bricks, tiles, pavers, garden stone, crushed rock, metakaolin. Due to grade of the kaolinite, it could potentially also be used to produce commercial kaolin, metakaolin, zeolite. Uses would include the strengthening of traditional Portland Cement, Geopolymer Cement or Porcelanic applications.	Eidsvold Siltstone seeks assistance to develop an Australian market for Metakaolin.
Eastern Stone and Minerals Private Company	**Hawkwood Granite Project.** (Development)	Proven reserves are 371,250 m^3 and Probable reserves of an additional 283,000 m^3 of black granite.	Road access. 370 km to Brisbane, 250 km to Port of Bundaberg via general access roads. Initial 35 km is unmade but all weather.	11kV power connected.	Sufficient water for operations available.	Premium black and green polished granite market.	Project is for Sale: Machinery, Sheds, Generators, Drills, Diamond wire saws all included.

Company	Project and Status	Mineral Resource including potential scale	Transport and logistics	Power	Water availability	Target markets	Investment Required/ Readiness
Maidenwell Diatomite – private company	**Maidenwell Project.** (Development)	1.3Mbcm mined at 50,000 tpa of diatomite. Potential for volcanic ash overburden to be commercialised.	General access roads available. Heavy transport (B Double) route within 20 km of project.	Connected to Ergon 11 kV network.	Sufficient water available on site for current operations.	Agricultural markets including for high 'plant available' silica.	

6 Summary of Infrastructure and Enhancement Potential

The Wide Bay Burnett region derives a significant proportion of its wealth from natural resources. The region is endowed with high quality agricultural land and mineral deposits. Mining contributed 5.7% to the region's 2017-2018 Gross Domestic Product and employed over 1,400 people in that year.[37] Given its proximity to Asia, the region's long term sustainable growth is assured if it capitalises on continuing national and international demand for these growth industries.[38]

A brief overview of the status of key infrastructure is provided below.

6.1 Rail

A Bundaberg Port Rail Link Study, commissioned by the Department of Transport and Main Roads, identified a potential alignment and corridor for a rail link from the existing North Coast railway to the Port of Bundaberg. The report concluded that at the time (circa 2007-2008), there was insufficient justification to preserve a corridor. Historic (2007) costs for construction of the rail link between the North Coast line and a northern riverbank site at the Port of Bundaberg was in the order of $70 million to $120 million for materials handling and new northside berth facilities.[39]

The Mungar-Monto-Taragoola rail line has been identified by several studies as a potential support for emerging mining activity, particularly bulk commodities such as bauxite and ilmenite. The 2011 Regional Plan for the Wide Bay Burnett Region, for example, recognizes that if a number of mineral deposits in the North Burnett are developed, the Mungar–Monto–Taragoola rail line may be investigated to cater for this potential demand. The retention and possible upgrade of rail infrastructure in the North Burnett would strengthen opportunities for mining in the region and provide an alternative option to road transport of materials.[40] This railway provided direct access to the Port of Gladstone with the last train in March 2008. In 2012, track maintenance ceased.[41] In February 2020, tenders were sought by Gladstone Regional and North Burnett Regional Council, to design the Boyne Burnett Inland Rail Trail. A Google Earth fly through over of the corridor as of August 2020 indicates that whilst the corridor is intact, little of the formation and track remains. Whilst many of the bridges remain, the Burnett River bridge near Mt Lawless is extensively damaged whilst the Reid Creek bridge for example, has gone. A section of road at Dirnbir has been re-aligned onto the rail corridor due to erosion of the old road near the Burnett River bank. Severe flooding in 2011 and 2013 would have exacerbated the damage to the railway corridor, in particular bridges and culverts.

Industry commentary suggests that a modal switch from road freight to rail freight would require a critical threshold volume to be reached in the order of 1 to 1.5 million tonnes of bulk product (including both mine inputs and exports) suitable for rail transport. Industry benchmark costs for rail construction vary. A range of AUD 5 to AUD 8 million per km is suggested as a rule of thumb estimator for non urban surface rail costs, excluding property acquisition, loading/unloading facilities, rollingstock etc. Urban rail costs can easily be at least twice this cost or more per km. A 2010/11 estimate by Orion for a 20km spur line and balloon loop in the Wide Bay Burnett area was estimated at AUD 80 million. Orion's least cost rail solution identified for north Burnett mineral projects was transport on the Monto line (for ABx for example), via the Moura System, with a capital cost of AUD 390 million.

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[37] Regional Development Australia, Project Status Report July – December 2019, found at https://www.rdawidebayburnett.org.au/storage/media/files/1l88wz/psr-wbb-screen-vzpx3je6.pdf

[38] Port of Bundaberg Precinct Outlook, 2019, found at https://37a60919-af70-449e-a074-269d8ed5cd0e.filesusr.com/ugd/545143_0970168aec1f416ab27f3528864033f9.pdf

[39] Department of Transport and Main Roads funded Study, undertaken by GHD, found at https://www.tmr.qld.gov.au/projects/bundaberg-port-rail-link-study

[40] Wide Bay Burnett Regional Plan, September 2011, found at http://www.dlgrma.qld.gov.au/resources/plan/wide-bay/wbb-regional-plan.pdf

[41] South Burnett Times, June 7, 2012, "Last train out of Monto gone."

Whilst rail has significant upfront costs, it has major environmental, safety and for large freight movements, relatively lower operating costs. In 2019, CSIRO studied the impacts of a potential modal shift from road to rail between Parkes and Narromine in Central West NSW. Researchers identified a baseline of existing freight movements to estimate the potential transport cost savings for the entire Inland Rail project, marking the first time such a detailed analysis on road to rail supply chains in Australia has been completed. They considered horticulture, and processed agriculture, such as meat, rice and dairy products. The analysis showed if existing agricultural road trips were shifted to Inland Rail, the agricultural industry could save between $64 to $94 per tonne (depending on back-loading). This equates to about $70 million in reduced transport costs per year based on the shift of 923,000 tonnes of horticultural and processed agriculture to the lower cost transport option that Inland Rail provides.[42]

Other major benefits of rail include the fact that road travel causes almost eight times more accident costs per kilometre travelled, whilst carbon emissions are 40% higher on road than rail for each kilometre.[43]

6.2 Road

Given the demise of regional rail over the past decades, improvements in higher productivity road vehicles, coupled with the high upfront capital costs of new rail construction, current bulk haul projects in the Wide Bay Burnett are seeking road based solutions. ABx for example, envisages expansion to 1 Mtpa beyond year 3, but at this stage is focussing on road based solutions for bauxite exports through the Port of Bundaberg.[44]

Figure 12 below, shows the overall State Road network in the Wide Bay Burnett which includes, State Roads, B Double routes, and Higher Mass Limit routes.

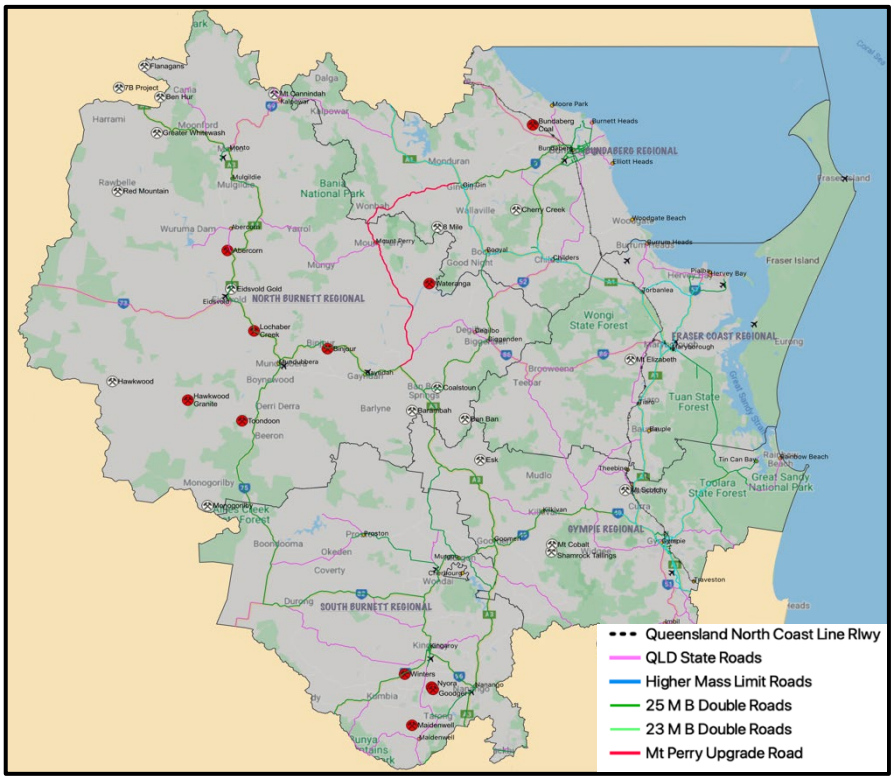

Figure 12: State Roads in the Wide Bay Burnett Region.

[42] CSIRO, 21 March 2019, "Inland Rail Offers Agricultural Savings on a Plate", found at https://www.csiro.au/en/News/News-releases/2019/Inland-rail-offers-agricultural-savings-on-a-plate)

[43] Deloitte Access Economics, November 2017, "Value of Rail"

[44] It is important to note that gold and silver mines, for example, do not require bulk transport for exports, but do import fuel in particular to use at site.

Higher Mass Limits (HML) routes allow gross combined mass for a 9 axle B Double to increase from 62.5 to 68 tonnes, potentially allowing an additional 5.5 tonnes of payload per trip. HML allows particular heavy vehicles to access additional mass entitlements providing:

- operators of vehicles or combinations running HML on triaxle groups are accredited under the Mass Management Module of the National Heavy Vehicle Accreditation Scheme (with an accreditation label fitted to the hauling unit); and
- vehicles are fitted with certified road friendly suspension; and
- vehicles are on an authorised route.

Currently only the Bruce Highway allows HML traffic, however there may be significant advantages for mining and agriculture, given the Region's importance in tree crops, sugar cane, fruit and vegetable production, to extend this to other specific routes.

The shortest distance from ABx's Binjour Project to Bundaberg Port is 187 km, however this route includes significant sections where B Double transport is not permitted. There are two potential routes which could be used, the B Double registered route through Ban Ban and Biggenden at 212 km, and an alternate via Mt Perry which is not currently a B Double route at 207 km. Opening the Mt Perry route shown in red on Figure 12, would provide additional capacity via a parallel route from Binjour to Bundaberg Port. This route also provides a shorter transit for Wateranga, and potentially connects with other projects in the region.

The Wateranga Project has two road based options. Option 1 is to join the nearest B Double route, the Burnett Highway, approximately 15 km east of Gayndah, and continuing to follow the B Double route to Ban Ban Springs where it joins the Isis Highway. Trucks would then travel through Biggenden to Dallarnil, Booyal, Apple Tree Creek and Bundaberg following the currently gazetted B Double route. This route requires 52 km of current Council and State roads to be upgraded to suit B Double transport from the mine to the Burnett Highway. Following this route from the mine to the Port of Bundaberg gives a total distance of approximately 227 km with a travel time for a heavy transport of 3 to 3.5 hours.

Option 2 would be to travel via the Gayndah - Mt Perry Road. For this route, approximately 83 km of Council and State roads would require upgrading to B Double standard. This route meets the Bruce Highway near Gin Gin and then follows the currently gazetted B Double route to the Port of Bundaberg. The overall distance is approximately 153 km and would be completed by a heavy transport in 2 to 2.5 hours, saving 2 hours per return journey. The route via Mt Perry would save 140 km per return trip, or 2 million km per year. Apart from direct fuel, maintenance and labour savings, the haulage could be completed with a smaller fleet. This proposed road upgrade may require realignment of curves, resealing of surfaces, and reduction of gradients.

The Gayndah – Mount Perry Road has approximately 23.5 km of unsealed sections with approximately 12 km south of Mingo Crossing, and 11.5 km between Mingo Crossing and Mount Perry. Residents have been campaigning for some time for the sealing of this road, with a petition presented to the Queensland Parliament in June 2017.[45] The Minister responded in July 2017, indicating that sealing of the roads in question (the Mount Perry to Monto Road was also included in the petition) was not considered a high priority at that time. As discussed above, the upgrade of the Gayndah – Mount Perry Road to B Double/heavy vehicle standard would provide a shorter route for Wateranga and would also provide additional flexibility for Binjour and Toondoon.

Through the Queensland Department of Transport and Main Roads website,[46] a number of potential heavy transport restrictions have been identified in the region. Figure 13 below shows five that are of interest to Wateranga, Binjour and potentially other users. These restrictions are not for regular semi trailer traffic, but

[45] Queensland Parliament, 14 June 2017. Found at: https://www.parliament.qld.gov.au/work-of-assembly/petitions/petition-details?id=2775

[46] Queensland Department of Transport and Main Roads, 21 January 2020. Bridge and Culvert Restrictions. Found at: https://www.tmr.qld.gov.au/business-industry/Heavy-vehicles/Bridge-and-culvert-restrictions

for over size and over mass transport. They do however provide some insight into areas where road works may be prioritised.

On the Mount Perry to Gayndah Road, there are three bridges with restrictions:

- The Spring Creek bridge south of Mingo crossing, where permits are required for over size or over mass transport;
- Coppermine Creek bridge in Mount Perry where there is a mass restriction; and
- Sunday Creek (Third crossing) in Mount Perry where there is a mass restriction.

Between Dallarnil and Childers, there is a culvert at Stoney Creek which has a "do not cross" restriction for over size and over mass vehicles. To avoid this culvert, the B Double route in this area diverges from the Isis Highway at Dallarnil and proceeds north to Booyal before joining the Bruce Highway.

On the Maryborough to Biggenden Road at the southern approach to Biggenden, the Rollinson Creek bridge is limited for oversize and over mass vehicles. This bridge has less impact on transport to Bundaberg as it is not situated between Bundaberg and the mines in the North Burnett. This bridge, as noted below, is currently being investigated by the Department of Transport and Main Roads.

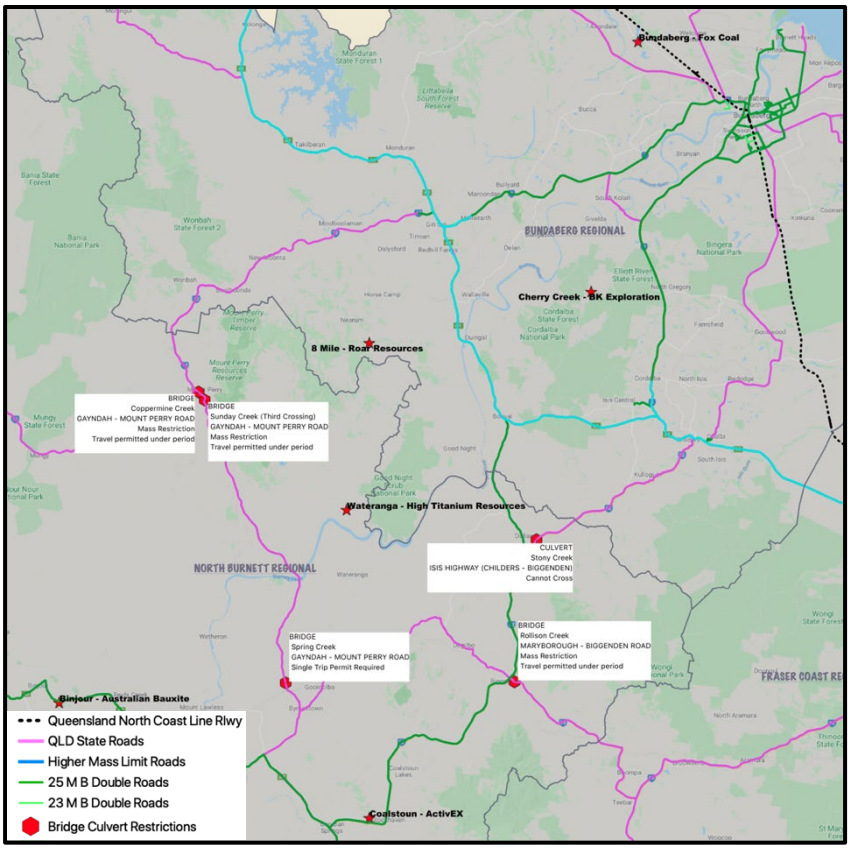

Figure 13: Mount Perry, Biggenden and Bundaberg area map showing current road restrictions.

In terms of relevant recent and current works, Lochaber Creek Bridge on the Burnett Highway was upgraded in 2019 (at a cost of $9.76 million) whilst the John Peterson Bridge over the Boyne River south of Mundubbera is scheduled for a $25 million upgrade starting in the 2020-21 financial year.[47] The Queensland State Infrastructure Plan 2019 also highlights the replacement of the Three Moon Creek timber bridge on the Burnett Highway (30km north of Eidsvold) at a cost of $18 million.

[47] South Burnett Times, 9 June 2020, found at https://southburnett.com.au/news2/2020/06/09/25m-funding-to-upgrade-bridge/

In addition to the abovementioned actions, to maximise benefits for freight in the region, upgrading the Burnett and Isis Highways and associated connecting roads to the Bundaberg Port to Higher Mass Limits capacity would further enhance productivity. B Double routes have a gross combined mass limit for vehicles using these routes of 62.5 tonnes. An upgrade of these routes to HML standard would allow payload increases of approximately 10%, saving truck movements and reducing per tonne costs**.** The routes would require assessment and upgrade to HML standard and would benefit the bulk haul projects such as Wateranga and Binjour/Toondoon as well as the agricultural and tourism sectors.

The Department of Transport and Main Roads advises it is currently progressing three studies on elements of the identified freight route to connect the North Burnett region to the Port of Bundaberg. These studies are:

- North Burnett to Port of Bundaberg Freight Route:
  The technical assessment of the route for compliance with the heavy vehicle route assessment guidelines, completed in 2019, is currently being reviewed with respect to the newly issued Route Assessment Guidelines for Multi-Combination Vehicles and PBS Vehicles in Queensland. This review will inform road link planning and identify priority areas, based on capacity, safety and amenity, associated with an increase in heavy vehicle freight movements that may be generated by development within the North Burnett Region.

- Bridge over Rollinson Creek at Biggenden:
  The timber bridge at Biggenden on the Maryborough to Biggenden State Road has been identified as a constraint on the use of higher efficiency freight vehicles. TMR has been progressing an options analysis to identify a preferred bridge replacement option, with funding in place to progress a business case in the later part of 2020. Funding of the project past the business case has not been assigned under any TMR programs. Whilst this does not provide immediate benefit for Wateranga, Binjour or Toondoon, the replacement of this bridge will provide additional flexibility for heavy vehicle routes through Biggenden.

- Bundaberg-Port Road Upgrade Strategy (Bundaberg-Bargara Road to the Port of Bundaberg):
  A detailed technical assessment has been undertaken on this section of the Bundaberg-Port Road, which will inform the Strategic Assessment of Services Requirements (SASR) currently being undertaken and scheduled for completion in the second half of 2020. The SASR is the first phase of the project assessment framework utilised by TMR for larger more complex projects. The SASR identifies those options to be progressed into the preliminary evaluation phase, and for the preferred upgrade option strategy within a business case, as well as being the first hold point with respect to approvals and funding for subsequent phases of the project.

6.3 Bundaberg Port

Providing a vital link for the Bundaberg Region's industry for over a century, the Port of Bundaberg is situated 19 kilometres downstream from the City of Bundaberg, near the mouth of the Burnett River. In 2018/19, the Port handled a throughput of 548,278 tonnes, double that of a decade ago. There is significant potential for additional growth.

The Port of Bundaberg is a significant asset for the region and reliant solely on road access. Recent works have been undertaken to improve that road access. The Port ring road is in place with identified future corridors. A $5.3 million upgrade to port roads is scheduled for completion in September 2020 providing for B Double access.

A 28.5km Bundaberg Port Gas Pipeline, branching off the existing Wide Bay gas pipeline west of Bundaberg, provides gas for industrial use at the Port.

A clear advantage for the Port of Bundaberg and its users, is its location outside of the Great Barrier Reef and any protected zones, whilst still having easy access to Asian shipping routes. Investigations have also confirmed that barge transhipment to a deepwater site within the Port limits is possible, to allow shipping via Cape-size vessels. ABx have partnered to invest in the future of the Port and facilitate new trade utilising

transshipping. The two organisations have signed a Memorandum of Understanding (MoU) that will investigate the feasibility of constructing and operating a 1Mtpa bauxite transhipment facility at the Port.

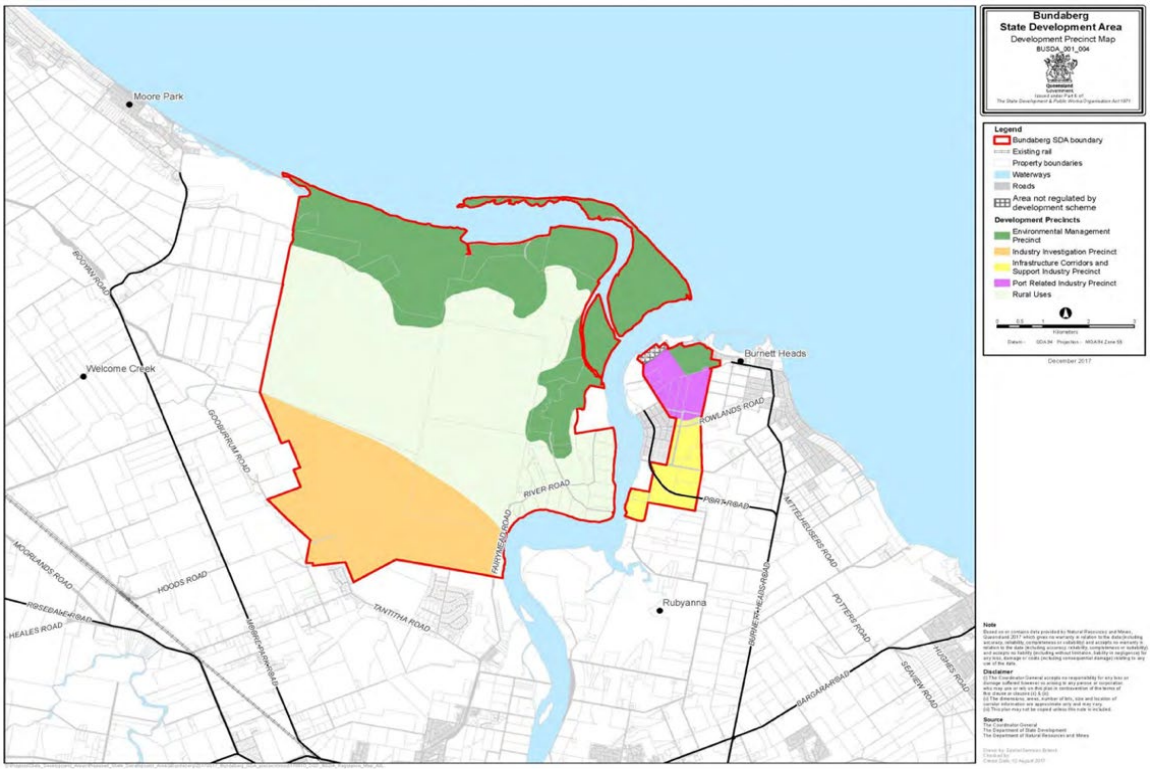

Figure 14: Bundaberg Port State Development Area.

The Port also benefits from the adjacent State Development Area declared in February 2017 and totalling 6,076 hectares. Development considered suitable for the Bundaberg SDA includes:

- manufacturing industrial development;
- extractive industry;
- large-scale industrial development;
- port-related activities;
- industries to support major industrial development; and
- materials transportation and utility and service infrastructure.

In 2018, Sugar Terminals Limited and Gladstone Ports corporation signed an MOU to jointly undertake engineering studies and develop a business case for new common user facilities at the Port of Bundaberg.

6.4 Water

Within the North and South Burnett, the key Sunwater-run water supply schemes are:

1. Boyne River and Tarong Water Supply Scheme supplied by Boondooma Dam.
2. Barker Barambah Water Supply Scheme supplied by the Bjelke-Petersen Dam. The dam is near Moffatdale in the South Burnett. It captures the flows of Barker, Four Mile, Six Mile, Frickey and Cattle Creeks.
3. Bundaberg Water Supply Scheme which sources water from Fred Haigh and Paradise Dams.
4. Upper Burnett Water Supply Scheme supplied by Wuruma Dam, John Goleby, Jones, Kirar and Claude Wharton weirs. Water is supplied to customers along 165 km of the Burnett River to Mingo Crossing.
5. Three Moon Creek Water Supply Scheme draws its water from Cania Dam and provides irrigation and urban water supply to users in Monto and Mulgildie.

Water in the Burnett River basin is allocated and managed under the Water Plan (Burnett Basin) 2014. This effectively caps the total volume of water that may be allocated in the basin i.e. existing water entitlements plus new entitlements that relate to planning provisions, including additional volumes of unallocated water reserves specified in the water plan. It also effectively specifies the minimum long-term reliability for each priority group of water allocations.

A review undertaken in April 2020 by consultants, Jacobs, of 60 existing studies identified three recurring themes for water in the region:

1. The North and South Burnett Regions contain significant environmental, climatological and economic advantages for agricultural and industrial enterprises with associated regional economic benefits;
2. Improving water reliability and security are critical to these enterprises and the region; and
3. A range of solutions for the water challenges in North and South Burnett exist, including some low-cost initiatives that focus on better use of existing resources without the need for large-scale investment.[48]

6.5 Power

As Figure 15 (below) demonstrates, the Wide Bay Burnett area is relatively well serviced by grid power and the potential mines (starred in red) are all generally within 5km (or generally less) of either 11kv or higher voltage lines.

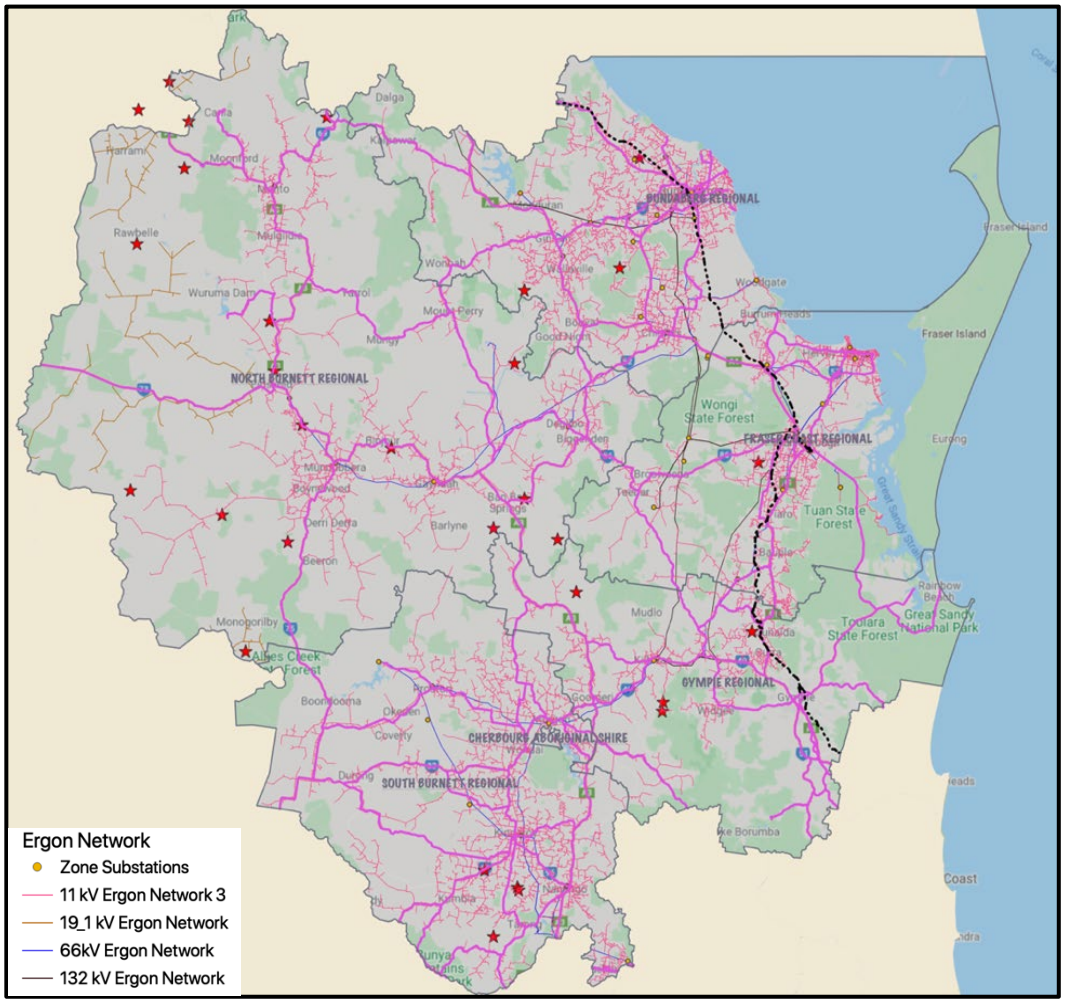

Figure 15: Ergon HV Network for the Wide Bay Burnett.

[48] For further information, refer to "Water supply requirements in the North and South Burnett: Strategic business case (April 2020), Jacobs.

Appendix 1 Wide Bay Burnett Region Historic Gold Fields

Historic goldfields in the region include:

- Mary Valley (south from Gympie). Alluvial and surface gold deposits were originally worked on a small scale near Imbil (40km by rail from Gympie) and a small production has been won intermittently from quartz veins occupying minor fissures in granite.
- Glastonbury (13km west of Gympie). Gold-bearing quartz reefs occupying fissures occur in altered sedimentary rocks near a granite contact. They vary in thickness from a few cm to about 1m. The output from the field has not been large. Small-scale operations were formerly conducted by a company which operated a small battery and concentrating plant.
- Yabba Goldfield (32km north of Kilcoy); also known as the Jimna field. It was essentially an alluvial field, and is credited with rich returns in the early years from deposits on Jimna and Sandy Creeks. Reef-mining followed on a small scale for some years with two plants on the field. A few small reefs carrying fair values have been worked in recent years.
- Kilkivan (72km by rail and 48km by road west of Gympie). On this old goldfield, restricted but rich shallow alluvial deposits were worked. There has been little gold production for about sixty years.

  Copper deposits were worked to a small extent at an early period at Mount Coora, Mount Clara and Black Snake. Re-opening of an old cupriferous gold lode at Black Snake in 1939 resulted in productive operations, with crushing, tabling, flotation and cyanidation plant on the ground, till 1949. Recently, several deposits in the area have been the subject of investigation by drilling.
- At Tansey Creek near Goomeri, an auriferous formation had been worked to a depth of 87m when work ceased in 1942. Recent dewatering and sampling indicated erratic distribution of values in the bottom workings.
- Marodian Goldfield (13km north of Kilkivan) Alluvial gold was found on Colo Flats and at Yorkey's Hill. Little work has been done on the field for many years.
- Nanango (209km by road north-west of Brisbane, and 27km from rail at Kingaroy), Gold deposits near the town, at the Seven-mile diggings (alluvial only) and also at Scrub Paddock (32km north-east) were worked at an early stage in the State's history. The last period of marked activity included an attempt by an English company to work a group of auriferous copper veins at Scrub Paddock. Despite intermittent prospecting over the wide area available, no discoveries of note have since been made. Prospecting of small auriferous reefs and leaders has been carried out near Emu and Possum Creeks in the Blackbutt area without marked success. Small deposits of silver-lead and of gold-bismuth have been worked near Mount Langan in the same area.
- Proston, (116km by rail west of Gympie), Some gold prospecting has been carried out in the Boondooma area, some 32km west of Proston, but nothing of importance has been recorded.
- Gold and antimony have been prospected at Glenbar (40km south-west of Maryborough).
- Biggenden (87km by rail west of Maryborough), A deposit of magnetite at Mount Biggenden was worked intermittently for its gold and bismuth content until 1938.
- Paradise Goldfield (13km north-west of railway at Degilbo), Stanton-Harcourt Goldfield (18km north of Degilbo, and Mount Shamrock Goldfield (19km west-north-west of Degilbo). These three small goldfields were worked towards the 1800s. Apart from a small amount of prospecting, little work has been done for many years. A little gold was also won on the Chowey, Mount Steadman and Gebangle fields a few kilometres further west.

- In the Mundubbera district gold prospecting was formerly carried on at Dykehead (29km west) at Hawkwood (48km west-south-west) and at the old Brovinia diggings (64km south-west of Mundubbera) but no discoveries of significance have been made.
- Eidsvold Goldfield (224km by rail from Maryborough). A group of auriferous fissure deposits was extensively worked between 1888 and 1900. An unexpected collapse of the field followed failure of values in the deeper levels of the principal mines. Although the reef formations proved to be persistent in depth subsequent efforts failed to locate workable shoots. Activity since 1906 has been limited to intermittent small-scale operations. On St. John's Creek, 26km south-west of Eidsvold, large quartz lodes have been worked spasmodically for antimony and gold.
- In the Bundaberg district, mining for copper and gold has been carried out extensively at the Tenningering field (108km from Bundaberg, with Mount Perry as its centre), and Boolboonda field (90km from Bundaberg). Gold reefs have also been worked at Reid's Creek. There has been very little mining in recent years although prospecting is being continued by several groups. Lode rutile has been found as shoad in the foothills of Mount Perry and traced to limited outcrops. A little gold has been won from a deposit at Swindon (22.5km east of Mount Perry), from which coarse alluvial gold was shed, but there is little prospect of other than small-scale production.
- Cania and Kroombit Fields (40km by road from Monto). A large quantity of alluvial gold was recovered in the past. Dredging was attempted, but it was not a success. There is little prospecting at the present time.
- Gaeta Goldfield (56km by road north-west of Gin Gin). On this small field an auriferous fissure reef was worked in the oxidized zone over a length of 800m, the last year of operations being 1907. The mine was unwatered in 1933 and has since been inspected by various interests, but without active results. Departmental drilling to test below the workings failed to intersect gold values of economic significance.
- Rosedale (55km by rail north-west of Bundaberg).

Appendix 2 Projects

Appendix 2.1 Exploration Projects

Appendix 2.1.1 Mt Cobalt and Pembroke Projects – Aus Tin Mining

The Mt Cobalt and Pembroke prospects held under EPM 19366 are owned 100 percent by Aus Tin Mining Limited and are located approx. 40km west of Gympie. Mt Cobalt and Pembroke are situated at the northern end of a significant polymetallic mineral system around the edges of the Black Snake Porphyry prospective for cobalt, nickel, copper, silver and gold.

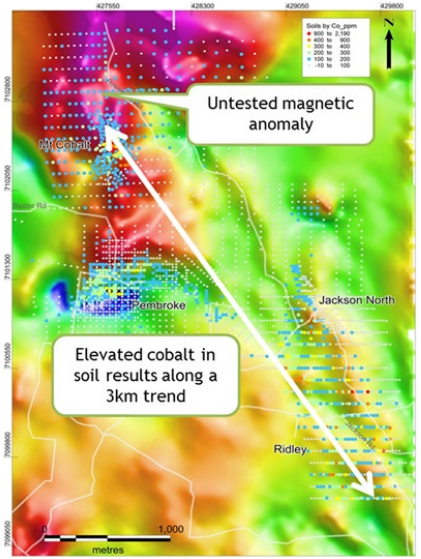

Figure 16: Mt Cobalt and Pembroke deposit.

At Mt Cobalt, previous exploration focussed extensive zones of nickel laterite (previously reported intervals of nickel and cobalt mineralisation up to 96m @ 0.59%Ni & 0.03%Co) but more recent exploration targeted higher cobalt-grade oxide material close to surface. Results from 2018 drilling announced by Aus Tin Mining[49] included:

- *COB030 averaged 0.32% Co, 0.62% Ni over 25m of assayed intervals, including 1.5m @ 1.48% Co, 1.3% Ni from 26.5m (last interval recovered and open at depth).*
- *COB031 and COB032 confirm high grade cobalt mineralisation close to surface with intervals including 1.1m @ 1.2% Co, 1.26% Ni and 1m @ 1.2% Co, 1.29% Ni respectively.*
- *Current target zone 350m long x 25m wide and open at depth and down dip to the west.*
- *North-south orientated structurally controlled target zone with potential to extend to north-west, and potential extension to south-west towards newly identified historic working.*

Aus Tin Mining are pursuing a low CAPEX model of initial development targeting high grade mineralisation after which they will expand to higher volume, average grade mineralisation.

At Pembroke, exploration has focussed on anomalous geochemistry results (copper and nickel) coincident with a magnetic high. Aus Tin announced drilling results for the Pembroke Project in March 2019[50] with highlights including the identification of new zones of nickel-copper associated sulphide mineralisation including zones of what appears to be radial fracture hosted mineralisation that may represent to halo above a potential target mineralised zone.

[49] Aus Tin Mining, 16 February 2018, ASX Announcement: Further high grade cobalt results at Mt Cobalt.

[50] Aus Tin Mining, 27 March 2019. ASX Announcement: Pembroke Drilling Identifies Zones of Deeper Nickel-Copper Mineralisation

Appendix 2.1.2 Ban Ban Project – Pennant Resources

Pennant Resources, a 100% subsidiary of Auburn Resources which is in turn 45% owned by DGR Global, holds the Ban Ban Project, approximately 30km south of Biggenden and 45km southeast of Gayndah, under EPM 26769.

The deposit, which has been well documented, is a pyrometasomatic[51] skarn restricted to a limestone bed within the Biggenden Beds which are underlain by a granitic intrusive complex of the Triassic Granitic Intrusives (locally the Mungore Complex). This is the likely source of the mineralisation.[52] Proven reserves of 214,000 tonnes at 8% zinc have been identified over a strike length of 207 m to a depth of 52 m and an average width of 4.6 m.[53]

Whilst the resource has been held by a number of companies historically, and deemed too small for mining development, modelling of the deposit by Auburn/DGR scientists in 2016 indicated potential to increase significantly the size of the deposit along strike and at depth.

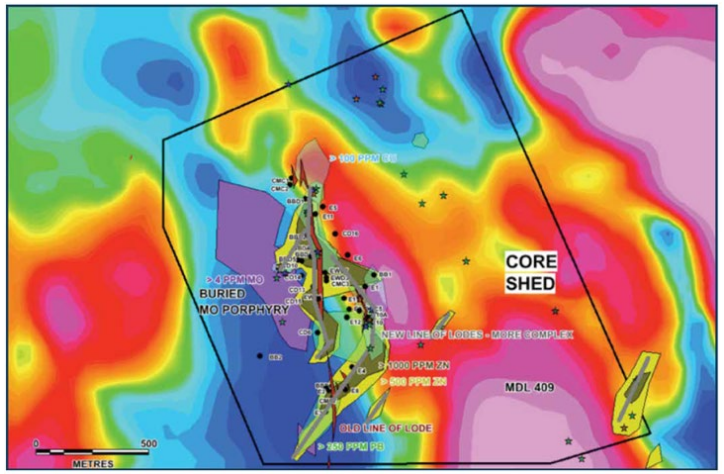

Figure 17: Reinterpretation of Ban Ban lines of lode based on new soil and rock sampling and 3D modelling of historic drill data.[54]

Auburn Resources have defined drilling targets.[55]

[51] Pyrometasomatic implies changes in the minerals/rocks due to hot fluids.

[52] Siemon, Green and Horton, Some Mines and Mineral Deposits of the Gayndah – Biggenden Area, in 1977 Field Conference Guide, Gayndah, Biggenden, Geological Society of Queensland, June 1977 and Ashley, P Geology of the Ban Ban Zinc Deposit: A sulphide bearing skarn, Southeast Queensland, in Economic Geology, Vol 75, 1980

[53] Davies, 1970 Final Report Authority to Prospect 398M near Ban Ban Springs (unpub) Geological Survey of QLD Library CR 3619 & Ban Ban Zinc Lode in Knight, C.L (ed) Economic Geology of Australia and Papua New Guinea, 1) Metals AIMM (1975)

[54] DGR Global, 2017. Annual Report

[55] DGR Global Apr 2020 to Jun 2020. Quarterly Activities Report

Appendix 2.1.3 Hawkwood Project – Auburn Resources Ltd

The Hawkwood Project is a nickel, cobalt, and copper project about 50 km southwest of Mundubbera held by Auburn Resources Ltd (Auburn), an unlisted subsidiary of DGR Global (45% owned). The Project is principally within EPMs 25948 and 26245, whilst Auburn also holds extensive surrounding EPMs including:

- EPMs 26012, 26013, 26246, 26248, 26526, 26529, 26758, and 26523, and
- EPM applications 27403, 27404, 27405 and 27406.

The project includes what was formerly known as the Hawkwood (Iron/Magnetite) Project of Eastern Iron which was delineated from 2010 to 2012 in a section of then EPM 25948 just north of Hawkwood Station. Auburn is the first explorer to prospect for nickel away from the magnetite deposit. Early soil geochemistry surveys by the company detected nickel cobalt copper platinum anomalies (Red Hill and Western Flats prospects) over Late Permian Intrusives (locally the Jack Shay Gabbro) located 20 km to the north-west of the magnetite deposit.

Auburn carried out airborne VTEM and Magnetics Geophysical Survey in 2018 with results indicating large conductors persisting to depth, presumed to be sulphides (which could suggest presence of nickel etc). Future drilling targets identified included the Red Hill and Western Flats prospects, in EPM 25948 and another unnamed anomaly in EPM 26245.

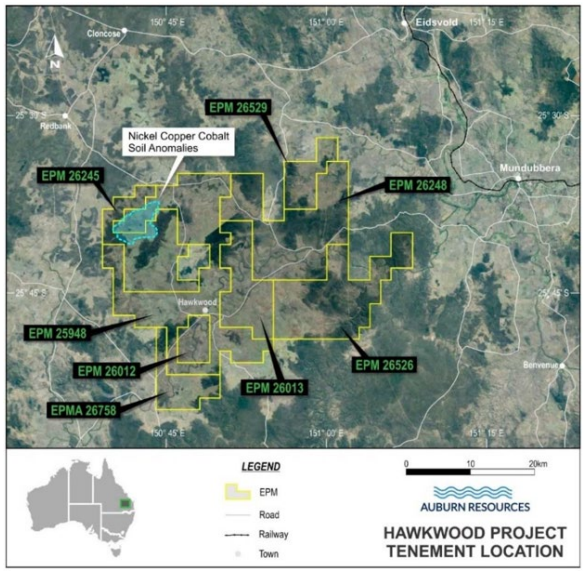

Figure 18: Location of Auburn Resources Hawkwood Project Area.

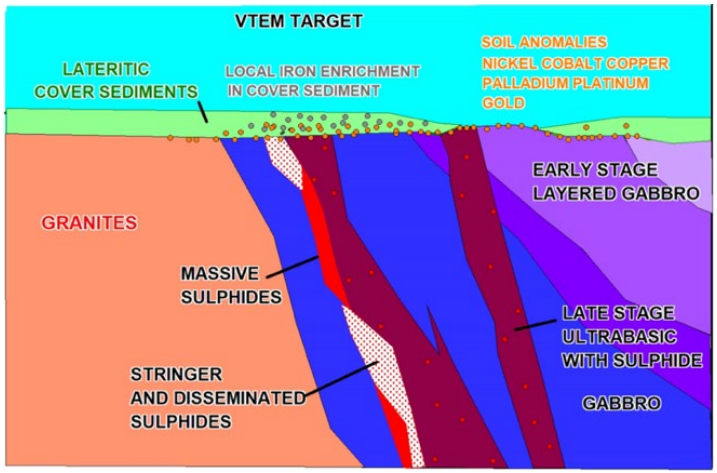

Figure 19: Conceptual Geological Cross-section of underlying sulphide mineralisation at Hawkwood.

Appendix 2.1.4 7B, Ben Hur and Greater Whitewash - AEON Metals

Appendix 2.1.4.1 Prospect 7B

Aeon Metals Limited holds the 7B copper-gold project and associated projects located approximately 40 km northwest of Monto. The prospect lies within EPMs 15921 and 17002. Aeon discovered 7B in early 2013, following up on identified magnetic anomalies, historical stream sediment sampling and known structural features.

Aeon's report of 26 March 2013 to the ASX[56] recorded that maiden drilling at 7B intersected numerous mineralised intervals containing sphalerite, galena, pyrite, barite, and chalcopyrite. Significant results from the prospect include up to 4.92% copper, 79g/t gold, 68g/t silver and 2.47% zinc. The prospect is interpreted as a significant volcanogenic polymetallic (copper–gold–molybdenum) mineral system.

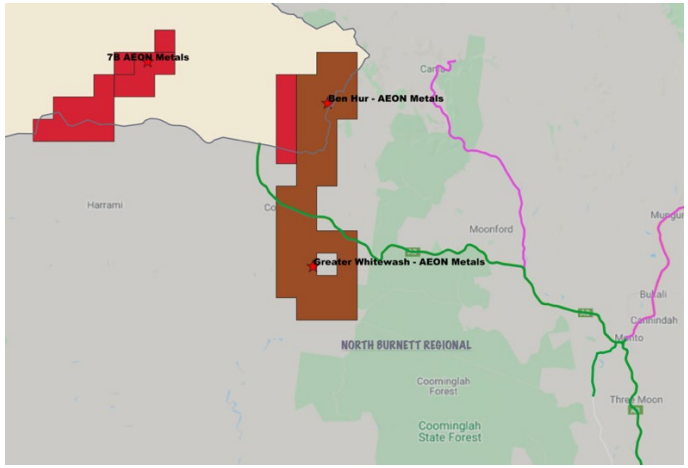

Figure 20: Map showing the Monto tenement package with main.

Appendix 2.1.4.2 Ben Hur

Aeon Metals holds the Ben Hur copper, molybdenum, and silver project located in the northern section of EPM 14628 northwest of Monto. The associated Greater Whitewash porphyry project lies to the south in EPM 14628 and the recently secured EPM27604. The porphyry style mineralisation at Ben Hur, like that at Greater Whitewash, is associated with volcanics of the Permian Yaparaba Volcanics, early to Middle Triassic Volcanics, and the Permo Triassic Rawbelle Granite complex.

Aeon's report of 31 July 2013[57] to the ASX recorded that a shallow zone of mineralisation with a 1.4km of strike length had been identified. The report also recorded that drilling of the John Hill Project confirmed that mineralisation extends into the Kiwi Carpet Project. The projects were henceforth to be combined as the Ben Hur project.

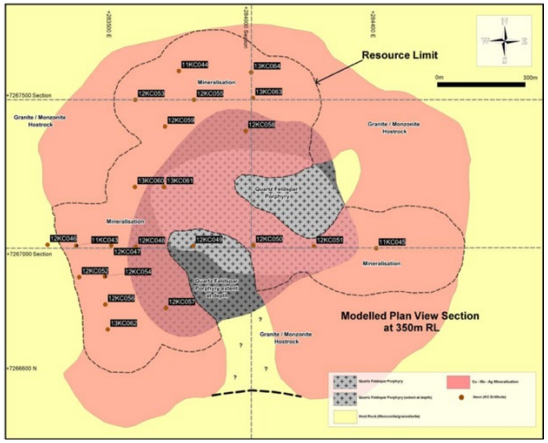

Figure 21: Plan view of current resource boundary of the Ben Hur porphyry system.

[56] Aeon Metals report to ASX 26 March 2013

[57] Aeon Metals report to ASX 31 July 2013

In November 2013, Aeon announced a maiden Ben Hur[58] JORC compliant Mineral Resource for the John Hill copper-silver-molybdenum zone of 190,000 tonnes of copper, 2,700,000 ounces of silver and 16,665,000lbs of molybdenum (at a 0.24% copper cut-off). The first phase of metallurgical testing recorded good copper recovery rates.

Appendix 2.1.4.3 Greater Whitewash Project

Aeon Metals holds the polymetallic (copper, molybdenum, silver) Greater Whitewash Project and associated projects approximately 40 km northwest of Monto. Greater Whitewash lies within MDL462 and EPM 14628. Company held EPMs17001, 17002, 17060 and EPMA 27604 (lodged on 28/7/2020) surround EPM 14628. Mineralisation comprises copper, molybdenum, silver and tungsten and is again associated with the same lithological sequences as at Ben Hur to the north.

AEON Metals announced on 30 May 2011, that:[59]

Independent consultants, SRK Consulting ("SRK"), report a total combined Indicated and Inferred JORC compliant resource of 242mt@604ppm (0.06%) Molybdenum Equivalent ("MoEq") based on a 425ppm MoEq cut off. In addition to this but not included in the MoEq figure, is 20 million pounds of Tungsten.

JORC Classification (@ 425ppm cut-off)	Total MoEqiv					Contained Metal		
	Mt	MoEq ppm	Mo ppm	Cu ppm	Ag ppm	Mo lb	Cu t	Ag oz
INDICATED	185	615	263	1189	1.55	108,533,294	220,403	9,220,589
Inc	*10*	*941*	*436*	*1688*	*2.03*			
INFERRED	56	569	239	1123	1.54	29,941,538	63,201	2,792,268
TOTAL	242	604	258	1173	1.54	138,880,000	284,000	12,046,000
Inc	*85*	*808*	*366*	*1470*	*2.09*	*68,876,066*	*124,331*	*5,988,844*

Further drilling has been proposed to refine the resource, together with further programs on the nearby prospects, 7B and Ben Hur.

[58] AEON Metals, 12 November 2013. Maiden Ben Hur JORC Resource – Substantial Copper, Molybdenum & Silver

[59] AEON Metals, 30 May 2011. Resource upgrade at Greater Whitewash Project to 242mt @ 604 ppm Moly Equivalent* 240% increase in tonnage

Appendix 2.1.5 Barambah – ActivEX

ActivEX Ltd holds the Barambah gold (EPM and 18732) project which lies in between Gayndah and Goomeri. The Barambah project consists of several low sulphidation epithermal gold and silver mineralised veins hosted by the Aranbanga Volcanic Group.

ActivEX announced a maiden JORC resource for the Barambah project on 13 February 2015 consisting of:[60]

> *Barambah Project: 363Kt @ 1.47g/t Au and 61.8g/t Ag (for 17.2 thousand ounces Au and 722 thousand ounces Ag of contained metal).*

Historical mining 1992/1993 of 25Kt @ 2.7g/t Au and 10g/t Ag for 2.1Koz Au and 7.8Koz Ag. The company anticipates deeper conductive gold geophysical targets beneath the current open pit to be tested in future. Repetitive vertical zones of gold mineralisation in epithermal systems are well known from other gold deposits such as Cracow and Pajingo.

The Company is reviewing funding options for a drilling program to increase the current gold resource.

The project is close to other ActivEX projects - Coalstoun and Esk.

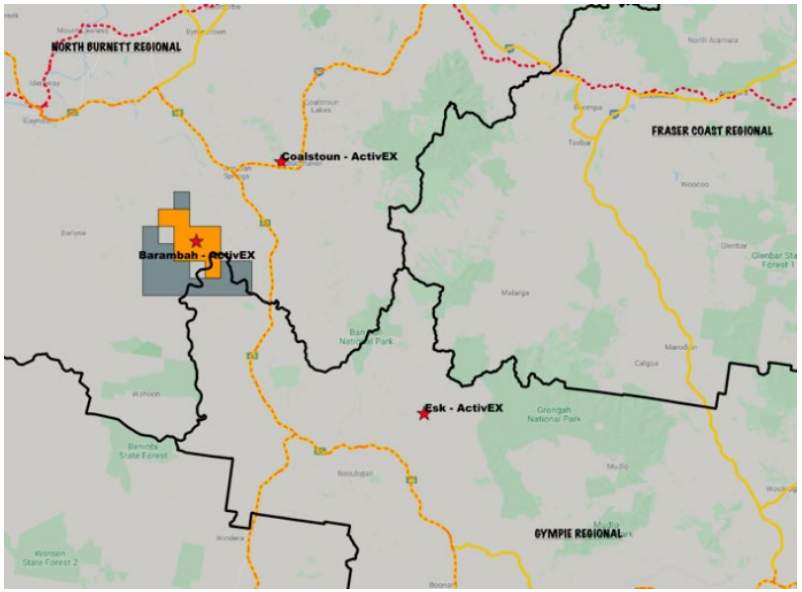

Figure 22: Barambah EPMs showing Coalstoun and Esk Projects in the area.

[60] ActivEX Pty Ltd, 13 February 2015. Barambah Gold Silver deposit Maiden Inferred JORC Resource.

Appendix 2.1.6 Esk – ActivEX

The Esk Copper and Gold Project consists of tenements EPMs 14476 (Booubyjan) and 16265 (Blairmore) which comprise a total 36 sub-blocks and encompass an area of 113 km^2.

The Company completed a diamond core and reverse circulation drilling program at Esk in August 2015 targeting supergene (enriched by low temperature weathering fluids) secondary copper and high grade copper and gold zones at the White Horse and Kiwi prospects within the Esk project, with the intention of establishing an initial Inferred Resource.[61] The drill program comprised two diamond core and 6 reverse circulation holes techniques for 156.4m and 331m respectively.

The best copper interval was obtained from the White Horse prospect:

12m @ 0.9% Cu and 0.1g/t Au from 29m (0.4% Cu cut-off and maximum 4m internal waste).

The Company is encouraged by the continued drill hole copper assay results obtained at the White Horse and Kiwi prospects and is looking to bring these prospects to resource stage. The project is close to other ActivEX projects - Barambah, and Coalstoun Lakes.

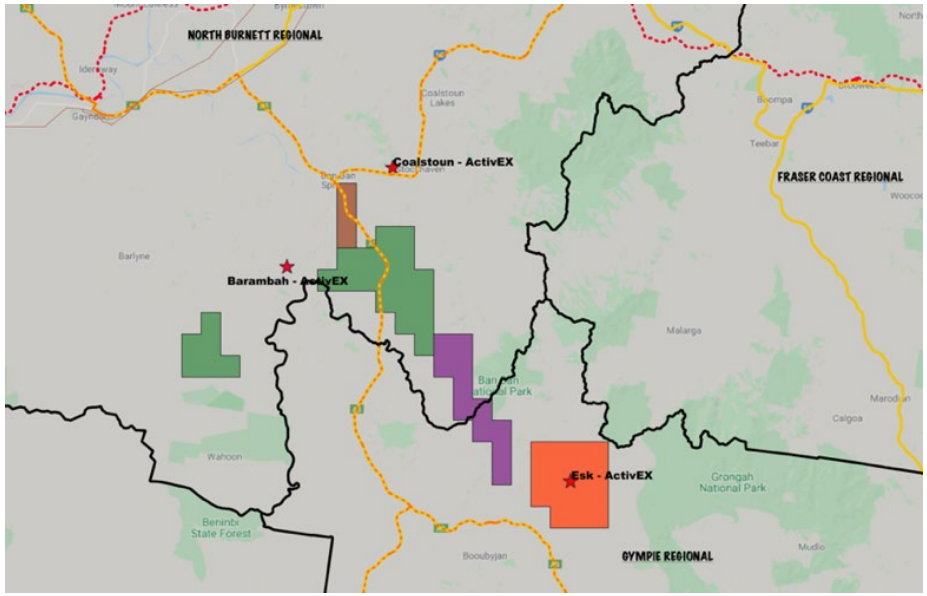

Figure 23: Esk Project EPMs showing Barambah and Coalstoun Lakes Projects in the area.

[61] ASX announcement 23 November 2015

Appendix 2.1.7 Coalstoun Lakes – ActivEX

ActivEX Ltd holds the Coalstoun Lakes copper gold project (EPM 14079) which lies in between Gayndah and Goomeri.

The project has had a lengthy exploration history commencing with drilling by the Department of Natural Resources Mines and Energy in 1964-65 through to a comprehensive review of geochemistry, geophysics and drilling by Newcrest Mining Limited between 2003-2013, prior to acquisition by ActivEX.

In 2015 ActivEX drilled extensively at Coalstoun Lakes and reported an increased Inferred Mineral Resource of copper in the supergene (weathering enriched) zone to 6.1Mt @ 0.5% Cu for 29,588t Cu contained at a 0.35% Cu cut off.[62] The previously reported Inferred copper resource for the whole deposit of 26.9Mt @0.38%Cu, for 102,700tonnes of contained copper[63] remained unchanged. The 2015 drill results and resource modelling highlighted priority areas for extensions to the supergene secondary copper mineralisation to the north of the current resource. These areas required drill testing.

The project is close to other ActivEX projects - Barambah, and Esk.

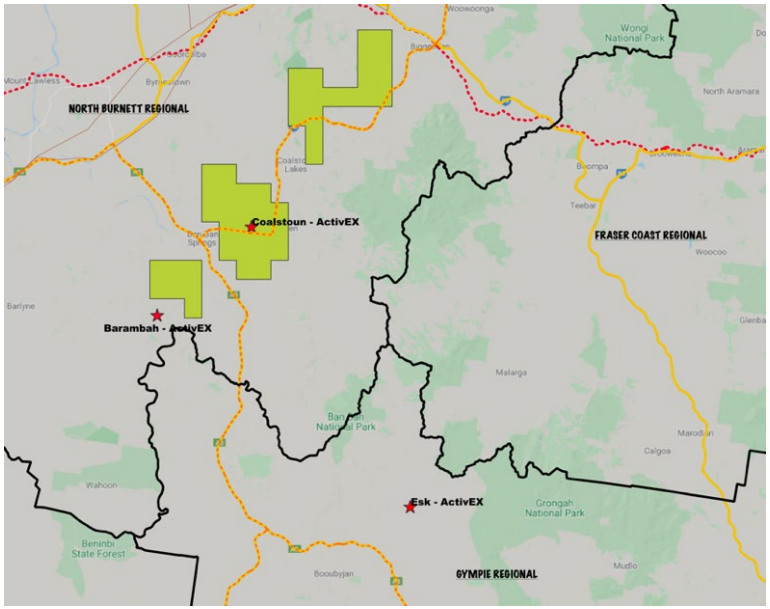

Figure 24: Coalstoun Lakes EPM showing Barambah and Esk Projects in the area.

[62] ActivEX 18 August 2016 ASX Announcement Coalstoun Lakes
[63] ActivEX 31 March 2015. ASX Annoucement Coalstoun Lakes

Appendix 2.1.8 8 Mile Project - MetalBank

Metal Bank (ASX: MBK) holds the 8 Mile Project, EPM 26945 to the northeast of the Mount Rawdon mine. The project area is underlain by Triassic granites and Permo-Triassic intrusive rocks. In April 2020, Metal Bank released the results of drilling in 2019 which defined a maiden resource of 195,000 tonnes at 2.4g/t Gold with a cut-off of 1.0g/t.[64] The mineralisation is epithermal vein type similar to Mount Rawdon and is open in all directions. The company is planning on further drilling to explore extensions, particularly down dip where grades and widths appear to increase under promising soil geochemistry anomalies.

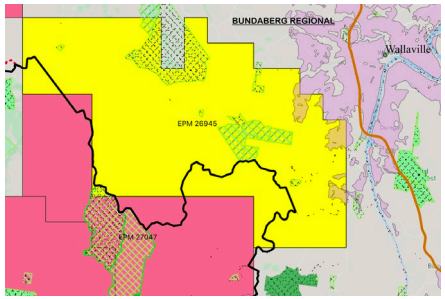

Figure 25: Roar Resources 8 Mile Project

Appendix 2.1.9 Eidsvold Gold - MetalBank

Metal Bank (ASX: MBK), through its subsidiary Roar Resources Pty Ltd, holds the Eidsvold Gold Project comprising EPMs 18431 and 18753. The project area is approximately 50km west of the existing Mount Rawdon goldmine and covers the historic Eidsvold Goldfield where high grade gold was reportedly won.

Metal Bank carried out regional scout drilling around historical goldfield area and followed up with regional airborne geophysics and soil geochemistry. The company identified the Great Eastern Target (6km northeast of the Goldfield) and the Mount Brady prospect (5km northwest of the Great Eastern target) where a five hole scout program returned up to 3 m @ 2.3 g/t Au and 1 m @ 17.4 g/t Au. Mineralisation was interpreted as intrusion related gold (IRG) associated with the Permian Eidsvold Intrusive Complex (granodiorite-diorite-gabbro). A preliminary drilling program has been proposed based on 3D modelling and elevated pathfinder geochemistry of the presumed IRG system.

On 28 July, the Queensland Government announced Round 4 of the Collaborative Exploration Initiative grants.[65] In this round, Metal Bank was awarded $86,000 to undertake drilling in these tenements to further explore several known targets of copper, silver, molybdenum (used to make steel alloys in engine parts), silver, lead, tellurium (a metal used to improve the strength of lead, copper and stainless steel) and zinc.

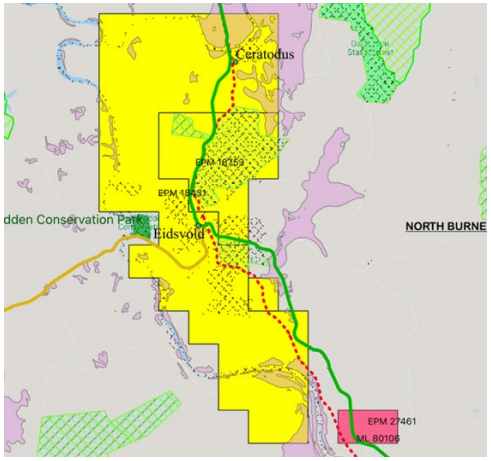

Figure 26: Roar Resources Eidsvold EPMs

[64] Metalbank Pty Ltd, 23 April 2020. ASX Announcement: 8 Mile Project Maiden Gold Mineral Resource and Exploration Target

[65] Minister for Natural Resources, Mines and Energy The Honourable Dr Anthony Lynham, 28 July 2020. State Govt backs hunt for new economy minerals

Appendix 2.1.10 Mount Cannindah – Cannindah Resources

The Mount Cannindah Project, located 115km west of Bundaberg is held by Cannindah Resources Limited. It is a medium sized porphyry copper-gold deposit. The company holds granted mining leases MLs 3201, 3202, 3203, 3204, 3205, 3206, 3207, 3208, 3209, and surrounding EPMs 14524, and 15261. The porphyry deposit is located along the contact between the Middle to Late Triassic Volcanics unit, the Rockhampton Group, and the Lorray Formation.

The company announced a JORC resource on 1 October 2014 when the company was known as Planet Metals Limited[66] consisting of:

Measured Resources	1.9Mt @ 0.96% Cu, 0.39g/t Au and 16.2g/t Ag
Indicated Resources	2.5Mt @ 0.86% Cu, 0.34g/t Au and 14.5g/t Ag
Inferred Resources	1.1Mt @ 0.97% Cu, 0.27g/t Au and 13.6g/t Ag
Total	5.5Mt @ 0.92% Cu, 0.34g/t Au and 14.9g/t Ag

This equates to a contained metal content of over 50,000t of copper, 58,000 ounces of gold and 2.4 Million ounces of silver.

Cannindah Resources has carried out further geochemical surveys and drilling to the north and south of the deposit and reports that the deposit is open at depth with significant opportunity to increase the resource estimate.

[66] Planet Metals Limited, 1 October 2014, Mt Cannindah focus yields High Grade Gold results

Appendix 2.1.11 Maryborough Project – BK Exploration

BK Exploration a wholly owned subsidiary of MAuB Pty Ltd, hold EPMs16655 and 16074 over an area north of Gympie and west of the Bruce Highway in the vicinity of Mount Scotchy, and a separate portion of EPM16655 west of Gunalda over the Bauple-Woolooga Road and Mount Atherton. In addition, the Company has EPM 16822 at Mt Elizabeth near Maryborough, EPM16824 near Tiaro. MAuB also holds EPM 18505, Cherry Creek near Bundaberg.

Collectively, this is known as the Maryborough Project which the company identifies as a district scale, high potential copper gold exploration project. The tenement holding is prospective for porphyry copper-moly-gold and low sulphidation epithermal gold-silver mineralisation styles with both having been intercepted in drilling.

Figure 27: MAuB Pty Ltd Maryborough Project exploration holdings.

The company identified greenfield gold mineralisation on Mount Scotchy in 2007. Drilling of 14 RC (Reverse Circulation) holes for 1,348m showed promising results for gold, silver, lead and zinc. Subsequently, 16 diamond core holes (for 3,053m) intersected sulphide bearing volcanics and sediments. Best results included:[67]

- 65.5m @ 1.2g/t Au, 17.8g/t Ag, 0.1% Pb, 0.2% Zn and 0.3% As, including 1.8m @ 6.6g/t Au and 1.70m @ 6.3g/t Au, 35.9g/t Ag
- 0.43m at 9.5g/t Au
- 0.43m at 452g/t Ag
- 0.73m at 15.2% Zn
- 0.71m at 6.9% Pb

Mt Elizabeth is an advanced prospect with porphyry mineralisation intersected in recent drilling (total of 19 holes- core and percussion- for 3,263 m). Drilling has returned narrow ore-grade and broad sub-economic grade copper mineralisation adjacent to an interpreted porphyritic intrusion(s). Intercepts include:

- 217m at 1000 ppm Cu, 43ppm Mo
- 202m at 900 ppm Cu, 44ppm Mo
- 400m at 800 ppm Cu, 50ppm Mo
- 0.3m at 1.95% Cu
- 2.0m at 0.35% Cu

Cherry Creek is interpreted as a low sulphidation epithermal styles deposit by the company, with results including:

- 5m @ 0.32 g/t Au, 0.61 g/t Ag at end of hole with As-Bi-Hg-Se trace element support

The company has also undertaken exploration at Tiaro and Cherry Creek Extension.

[67] Buka Gold Pty Ltd, Annual Report 2009

Appendix 2.1.12 Red Mountain – Black Dragon Energy

Black Dragon Energy Pty Ltd, a wholly owned subsidiary of Zenith Metals (ASX:ZNC) was granted EPM 26384, Red Mountain Project, southwest of Monto, in March 2017.

An exploration drill program was announced in May 2020. Early results from a small component of the program include:

- 13m @ 8.0g/t Au including 6m @ 16.7 g/t Au from surface
- 5m @ 3.5 g/t Au & 54.3 g/t Ag including 2m @ 8.0 g/t Au & 109.4 g/t Ag from 64 m depth
- 12m @ 1.0 g/t Au from 42m depth including 4m @ 2.1 g/t Au from 50 m depth, within broader mineralised interval of 56m @ 0.4 g/t Au from 6m depth.

These encouraging gold and silver results are for the 250m of strike of a 1200m long high-order gold anomaly. A previous geochemical survey of the anomaly reported soil values including: 2.2g/t Au, 1.6 g/t Au, 0.56g/t Au and 0.33 g/t Au and gold in rock chips to 2.0 g/t Au & 114 g/t Ag.

Appendix 2.1.13 Flanagans – Black Dragon Energy

Black Dragon Energy Pty Ltd, a wholly owned subsidiary of Zenith Minerals Limited (ASX:ZNC) was granted EPM 27478, Flanagans Project, northwest of Monto, in March 2017. The company announced on 15 April 2020:[68]

Based on historical exploration activity the target at Flanagans offers a very positive framework to build upon, including:

- *Scale - 1.5km long by 180m wide gold rich quartz vein zone hosted by diorite*
- *Defined Grade vectors:*
  - *Strong gold rock chips results including: 20 g/t Au, 12.0 g/t Au, 11.5 g/t Au, 5.25 g/t Au, 3.3 g/t Au, 3.2 g/t Au, 2.6 g/t Au and silver to 70 g/t Ag*
  - *Very high gold in soils (3 zones over the 1.5km of strike, peaking at 8.69g/t Au with one area 180m x 40m at >1 g/t Au)*

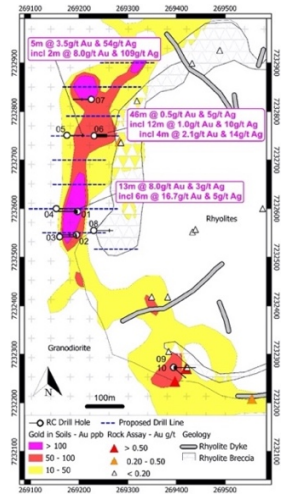

Figure 28: Red Mountain

- *Depth Potential - Flat lying gold bearing quartz veins providing potential for a vertically stacked quartz vein hosted gold system*

A drilling program is planned for Flanagans.

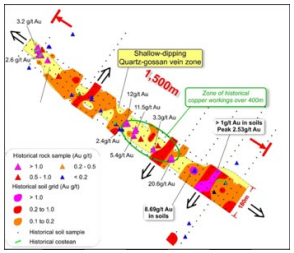

Figure 29: Flanagans gold target - geochemical and geology summary.

[68] Zenith Metals, 15 April 2020. New Highly Prospective Gold Project Secured in South East Queensland

Appendix 2.1.14 Shamrock Tailings Project – DGR Global Ltd

DGR Global Ltd (ASX listed) holds a significant area of the historic Kilkivan mining area and associated tailings under a series of mining leases 3752 (Shamrock Tailings), 3753 (Shamrock Tailings Extended), 3741 (Shamrock Extended), 3749 (North Chinaman), 3678 (United Reefs), 50148 (Tableland), and 50291 (Black Shamrock). All tenements are located on DGR Global owned freehold land.

DGR Global announced a JORC compliant resource on 4 August 2014 for Shamrock tailings[69] which included:

- *Indicated: 770,000 tonnes @ 0.58 g/t Au for 450,000 grams (14,000 ounces) gold; and*
- *Inferred: 770,000 tonnes @ 11 g/t Ag for 8,242,400 grams (265,000 ounces) silver.*

The mine tailings are sited at the junction of Mining Leases 3741, 3749, and 50291.

The price for gold is currently around A$2800 (US$2000) per ounce and at such prices the economics of extraction may be favourable.

Appendix 2.1.15 Monogorilby – IronRidge Resources

Listed company IronRidge Resources (LSE:IRR) holds EPMs 16260 and 16261 through its subsidiary Eastern Exploration over the bauxite-titanium Monogorilby Project.[70] The project is in the vicinity of Durong approximately 60 km west of Proston.

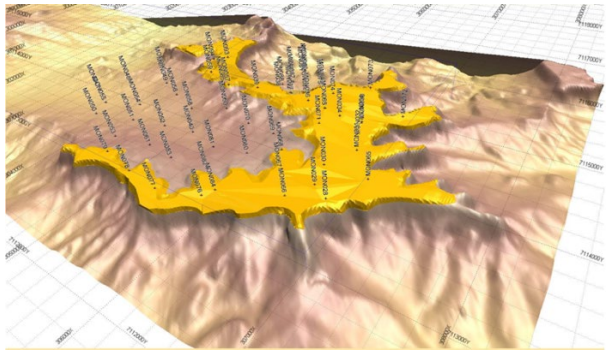

Figure 30: Monogorilby mineralised domain interpretation looking north north west.

IronRidge Resources announced in July 2016 a maiden JORC compliant Inferred Resource of 54.9 Mt of bauxite with total aluminium content of 37.5 % Al and 8.5 % total Silica and 3.8-5% titanium. IronRidge Resources on 29 July 2016 reported that:[71]

Results of metallurgical test-work to date on surface duricrust and the top 1-3m of plateau material, demonstrate that 44-36% alumina and 14-3% silica head-grade material can be beneficiated through simple crushing, screening and scrubbing to a good to premium quality Direct Shipping Ore (DSO) bauxite at 44-52% alumina (>36% available alumina) and 2-5% silica (>2% reactive silica), at 85-5% mass-recovery respectively.

[69] DGR Global Limited, 4 August 2014. ASC Announcement: Shamrock Tailings Resource.

[70] A further EPM 19419 is held by IronRidge Resources to the north of Monogorilby.

[71] IronRidge Resources, 29 July 2016. Maiden Resource Estimate of 54.9 MT Bauxite at Monogorilby Newly identified bauxite province with significant scale potential

Appendix 2.2 Development Projects

Appendix 2.2.1 Wateranga – High Titanium Resources Limited

The Wateranga Ilmenite Project, held by High Titanium Resources and Technology Limited (HTL) through their subsidiary, Queensland Industrial Minerals PTY LTD, is located 25 km southeast of Mount Perry and 80 km southwest of Bundaberg. The company holds a mining lease (ML 80116) granted on March 29, 2018, and a surrounding EPM (13278). The deposit comprises eluvial, alluvial and hard-rock deposits of ilmenite, high-alkali feldspar, apatite, and mica, with minor corundum, zircon, rutile, and magnetite. Scandium is also present within the minerals. The deposit consists of unconsolidated and hard rock resources, with the eluvial and alluvial components at or near surface and are associated with the Wateranga Gabbro which is approximately 5 km wide by 6 km long and is characterised by an outcrop some 1.6 km long, 600 m wide and 120 m high.

Drilling and exploration to date has defined a resource of 204 million tonnes, in the unconsolidated material, with a recovered grade of 5% Ilmenite. Additionally, the deposit contains: 20% High Alumina Feldspar, 0.8% Apatite and 30 parts per million Scandium. Other minerals shown to be present in the deposit include Zircon 0.2% and Rutile at 0.1%, with only 30% of the mineralised area having been drilled to date.

The remaining milestones for Wateranga are:

- Developing a pilot plant for the provision of bulk samples to targeted customers;
- Establishing off-take arrangements with customers(Investment and offtake agreement has been signed);
- Bringing the project into full production.

High Titanium Resources has been in discussions with Bundaberg Port regarding exports from the port[72] initially in the order of 20,000t - 25,000t for each shipment, which could be increased as the port develops.

The extraction process uses low impact gravity and magnetic separation. 800Ml water a year is required for the extraction process and the company is in advanced discussions to secure a reliable water allocation.

The mine has three areas including Central, Northern and Southern. The first area to be developed is the Central area (mine life of 15 years) with the remaining areas extending project life to an estimated 30-40 years. The first ilmenite export is expected in the second quarter of 2022.

The mine is 6.25 km from the 66 kV line which feeds Mt Rawdon. This 66kV line is fed from the Isis substation (132/66 kV) near Childers. Wateranga have stated that they would use generators to supply power to the mine.

Wateranga have two immediate transport options to move product to the Bundaberg Port, both road based. The first option actively canvassed by Wateranga is to use 25m B Double road transport with a gross combined mass of 62.5t. This is likely to achieve a payload of approximately 40 to 42t. The distance is approximately 227 km. The second option is to use 19m B Doubles on general access roads in Queensland. The 19m B Double has a gross combined mass of 50t, and the distance from the mine to Bundaberg port using these vehicles via Mt Perry shortens to 153 km potentially allowing significantly reduced turnaround times.

Wateranga is adjacent to the Paradise Dam on the Burnett River. Water allocations may be available for purchase from several of the schemes on the Burnett.

[72] Haupt, Mikayla, 29 Jan 2020, The Chronicle: Port to add ilmenite exports from mine west of Bundy

Appendix 2.2.2 Binjour/Toondoon – Australian Bauxite

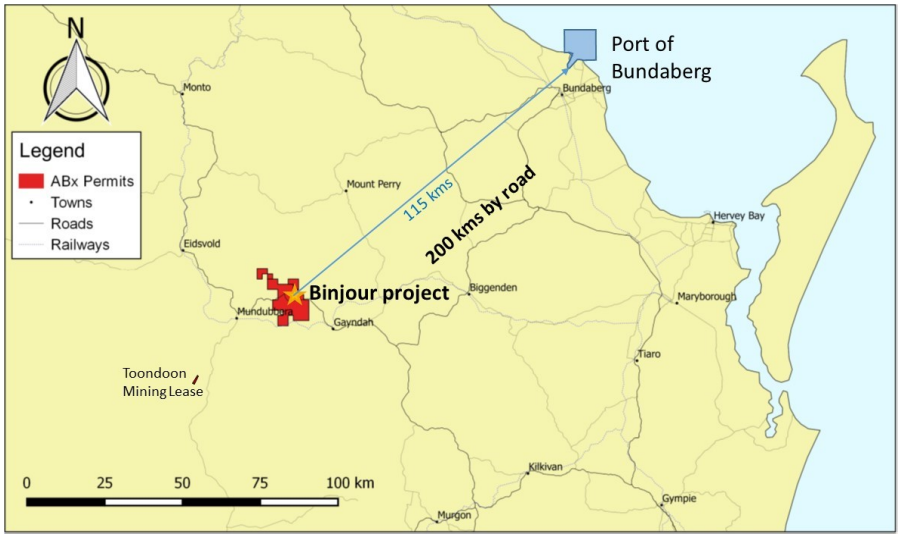

Figure 31: Binjour and Bundaberg Port.

Australian Bauxite (ABx) holds this project comprising two sites, Binjour and Toondoon. Binjour, 24 km to the west of Gayndah, is the larger deposit held under EPM 18014. It contains 22.8 million tonnes of JORC Indicated Resources and 14.2 million tonnes of Inferred Resources. Toondoon has an Inferred Resource of 3.5 million tonnes and is reported to contain metallurgical, cement, and fertiliser grade material. A mining lease is in place for Toondoon and it may serve as additional supply in strong markets.

ABx announced that the Binjour Project is fully funded by marketing partner, Rawmin Mining of India,[73] and further:[74]

- A tripartite Memorandum of Understanding (MoU) is in place between ABx, Rawmin Mining and Industries of India and Tianshan Aluminium of China for the sale of 0.5 to 1.5 million tonnes of bauxite from Binjour to Tianshan's new low temperature refinery in southern China which is due to commence production in mid 2021;
- ABx considers Binjour to be a high quality source of gibbsite-trihydrate (THA) bauxite suitable for processing in low-temperature Bayer-technology alumina refineries and sweetener circuits;
- Binjour bauxite is 3 to 15 metres thick and comprises 10.4 million tonnes suitable for simple bulk mining and direct shipping as "DSO Bauxite" and 26.6 million tonnes to be upgraded by ABx's proprietary TasTech technology to achieve the long-term sales grade of 44% to 45% Al2O3 & 5% SiO2 which is ideal "metallurgical bauxite" for producing aluminium metal via the low-temperature Bayer alumina refineries;
- A Memorandum of Understanding Agreement for access to the preferred stockpile site at the Port of Bundaberg was finalised and executed during 2019.

The Binjour Project will maximise ABx's production during the Queensland dry season from April to November and ABx's Tasmanian mine will maximise production from December to May. Rawmin's mines in north western India will maximise production in the Indian dry season from November to May but cease shipments in monsoon months June to September. Coordinated production and shipments of bauxite will achieve all-year delivery to the customer at a consistent specification.

The co-venturers seek investment from an end-user bauxite customer to increase confidence of sales continuity during market cycles.

[73] Australian Bauxite Limited, ASX Announcement 16 December 2019

[74] Australian Bauxite Limited, Quarterly Activities Report April 30, 2020

Appendix 2.2.3 Abercorn Project, - Abercorn Kaolin

Abercorn Kaolin Pty Ltd currently hold EPMs 19081, 26837, 26903, and 27427 in the Abercorn locality, approximately 40 km south of Monto. Abercorn Kaolin's parent company is Metalsearch Limited, (ASX:MSE) a publicly listed exploration and development company. Metalsearch acquired Abercorn Kaolin in August 2019 and has since conducted an extensive 62 hole drill program. The maiden JORC resource was announced on 6 July 2020 consisting of:

- Total Maiden Resource for the Abercorn Project area is 39.06Mt yielding 36.8% -20µm grading 28.6% Al_2O_3 & 1.18% K_2O, using a cut-off grade of 26% Al_2O_3
- A high-grade section within the Project area called the Railcut Prospect contains 14Mt yielding 38% -20µm fraction grading 30.26% Al_2O_3 & 0.89% K_2O, using a cut-off grade of +29% Al_2O_3
- A second high-grade section within the Project area called The Area 3 Prospect contains 1.66 Mt yielding 30.9% -20µm fraction grading 30.7% Al_2O_3 & 0.83% K_2O

Metalsearch and the University of Queensland's technology transfer company UniQuest have signed an exclusive licence agreement to further commercialise a novel approach to the production of synthetic zeolites – manufactured minerals (commonly known as molecular sieves) often used in water treatment and detergents.

Metalsearch aspires to improving environmental outcomes by continuing to build on the potential of our zeolite mineral processing technology to be applied as a commercial remediation solution for suitable mine tailings, by using tail streams and/or residues as feed for low cost production of zeolites.

Next Steps for this project include:

- Conduct Kaolin marketability testing program, including:
  - Specialised Mineral testing;
  - ISO brightness and particle fineness testing; and
  - End user product requirement.
- Fast track commercialisation of synthetic zeolite mineral processing technology, having partnered with the University of Queensland School of Chemical Engineering to develop novel and proprietary zeolite mineral processing technology that consumes kaolin or suitable mine tailings and residues to produce high value zeolites. The technology has the potential to fast track development of the Abercorn Project, with a low capital cost to reach commercial production, utilising the company's existing kaolin feedstock. It also provides potential opportunities to monetise broader application of the technology outside the company by offering a significantly lower cost method of manufacturing zeolites compared to conventional processes.

Appendix 2.2.4 Goodger, Winters and Nyora – Terrequip Environmental

Goodger, Nyora and Winters are three kaolin mines south of Kingaroy which were originally developed by Sibelco. The mining leases are MLs 5676, 5679, 5684, 5685, 6621 and 50130. On June 4, 2020, the leases were transferred to Terrequip Environmental Pty Ltd. Nyora and Winters have undeveloped resources, whilst Goodger is under rehabilitation.

Figure 32: Terrequip Kaolin mine near Kingaroy.

Kaolin or china clay is a white, soft, plastic clay, mainly composed of the mineral kaolinite. It is chemically inert, non-abrasive and has low heat and electricity conductivity. Selected high brightness china clays fire to a pure white colour and produces high quality ceramics. High purity kaolin can also be used in paper coating to produce glossy white paper for high quality publications, as well as in soaps and cosmetics.

Kaolin from these mines has been supplied to markets for many years. It is renowned for its purity and colour that makes it ideal for broad range of uses.

Appendix 2.2.5 Bundaberg – Fox Coal

Fox Coal Pty Ltd holds this project under EPC1523, covering an extensive area to the west of Bundaberg underlain by a shallow cover of Tertiary Elliot Formation overlying the Burrum Coal Measures. In October 2019 the company applied for MDL 3040 over a large section of the EPC. The deposit comprises thin seam coking coal. The project is a 50/50 joint venture between Fox Holdings and Zimprops Coal Pty Ltd.

On 30 May 2018, Fox[75] reported an Indicated and Inferred Resource of 147.3 million tonnes comprising 64.3 million tonnes of indicated resources, 83 million tonnes of inferred resources, in accordance with the 2012 JORC Code. In addition, there is an exploration target of 5 to 35 million tonnes. Coal Quality sampling and testing programs and analyses were completed in August 2019.[76] Testing of the three main seams reported raw ash less than 20% with raw calorific values exceeding 7,000KCal/kg for large sections of the seams. The raw total sulphur was manageable with the highest value 0.87%. A coking coal indicator, raw crucible swell number (CSN), returned for large sections of the seam reported numbers exceeding 8.0 (Peak Downs for example, hard coking coal specification is 8.5 CSN).

Fox Resources in an announcement of 20 November 2019 advised[77]:

The mining concept for a metallurgical coal mine if approved, will be an underground mine with a small footprint on the surface.

The capital expenditure will be approximately $250m and will result in approximately 150 permanent jobs in the region for the next 20 years.

Subject to studies the coking/metallurgical coal will be exported preferably through the Bundaberg Port, however, if this is not feasible it will be shipped through the Gladstone Port.

The project is well located in relation to infrastructure with the main rail line to Gladstone traversing the EPC. A transhipping option from Bundaberg Port is also being investigated.

[75] Fox Resources Ltd Shareholder Update May 30, 2018, found at http://www.foxresources.com.au/pdf/FXR_Bundaberg_Inferred_Resource_May_2018.pdf

[76] "Fox Resources Limited (Fox) wishes to announce that the current drilling program on EPC 1523 has been completed, and the updated resource will be released once the resource model is finalised." (26 August 2019)

[77] Fox Resources, 20 November 2019, *The Following information was provided to the NewsMail in Bundaberg on Wednesday 20th November 2019 –*

Appendix 2.2.6 Lochaber Creek Project - Eidsvold Siltstone

Eidsvold Siltstone Pty Ltd has mined dimension stone since the company was founded by Victorian geologist Michael Whitty in 2000. Mining leases ML80091 & ML80106 were granted in 2000 and 2003. EPM 27461 was granted in February 2020 and EPM 27553 was applied for on 10 June 2020.

Eidsvold Siltstone produces a wide range of cut and uncut products such as bricks, tiles, blocks and flagstones. The offcuts are crushed and screened, then tumbled into a white landscaping pebble marketed on the Sunshine Coast. Eidsvold Siltstone is one of the very few dimension stone businesses left in Australia and the only producer of white coloured sandstone/siltstone.

The company is also examining the feasibility of utilising the fine dust from the diamond sawn (evaporated slurry) powder and cutting and crushing processes and has visited the US to study uses of stone dust. It has also undertaken two research projects locally. The first, with University of Western Sydney, examined use of the stone dust as a concrete additive to increase strength and succeeded in this goal.

A new program at QUT to upgrade the dust to metakaolin for use in geopolymer concretes is under way.[78] Geopolymer concretes have a lower energy footprint. Upgrading the dust to metakaolin would offer a useful "green" product for a market demanding improved environmental outcomes. The proponent advises that this program focuses on gaining access to QUT's "Chapelle Test" hardware to measure the reaction between the fixed Calcium Hydroxide $Ca(OH)_2$ & the Metakaolin Al_2O_3.

Further, the proponent advises that currently, Eidsvold Siltstone is the only local supplier of Metakaolin, however this is at a low level and into the local Artisan Markets and is receiving positive feedback.

Eidsvold siltstone is actively examining exploration for bauxite, kaolin and silica through additional EPMs.

[78] North Burnett-based Eidsvold Siltstone Pty Ltd received more than $55,000 from the Advance Queensland Ignite Ideas Fund to work with QUT researchers in determining how the fine talc-like powder produced from sawing sandstone into blocks could be turned into metakaolin, a cement strengthener used in Europe and the United States of America. Eidsvold Siltstone Managing Director Michael Whitty said the Ignite Ideas funding had helped him identify the optimal minute particle size the dust needed to be reduced to and the temperature needed in the kiln to produce the most reactive metakaolin. "My immediate task is to develop this metakaolin to a point that satisfies our potential export market," Mr Whitty said. (SOURCE: Minister for Innovation and Tourism Industry Development and Minister for the Commonwealth Games, Advance Queensland program set to ignite ideas, March 27, 2018)

Appendix 2.2.7 Hawkwood Project – Eastern Stone and Minerals

Eastern Stone and Minerals has Mining Lease 80054 for a granite quarry located at Hawkwood, west of Mundubbera. Ownership of Eastern Stone and Minerals is 100% GSB Chemicals of Broadmeadows Victoria.

The quarry produces black granite dimension stone. Proven reserves are 371,250 m^3 and Probable reserves amount to an additional 283,000 m^3 of black granite. The possibility exists of extending the reserves through further drilling and development.

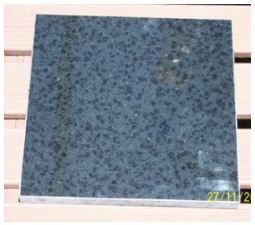

Figure 33: Green granite sample

Figure 34: Mundubbera black sample

Figure 35: Hawkwood Granite Mine Google Earth image

Appendix 2.2.8 Maidenwell – Maidenwell Diatomite

The Maidenwell Diatomaceous Earth (DE) deposit is located on Brooklands Road 10 km northwest of Maidenwell and 29 km south of Kingaroy. Maidenwell Diatomite Pty Ltd holds MLs 50118, 50222 and 100105 over the deposit.

The Mine re-opened under the Maidenwell Diatomite name in 2016, and now focuses on supplying diatomite and diatomaceous earth products for the agricultural industry. Production was increased to 50,000 tpa in 2018/19. A life of mine development plan has been prepared based on existing probable reserves of 1.3Mbcm (Million bank cubic metres) of Diatomaceous Earth.

The mine development plan encompasses significant volumes of high quality agricultural and industrial-grade Diatomite. There is also interest being shown in the overlying siliceous Volcanic Ash (currently treated as overburden), as a commercial by-product, principally as an additive for the industrial sector and in the agricultural industry as a soil conditioner.

Maidenwell diatomite is composed of the skeletons of Melosira diatoms.[79] Total Silica generally exceeds 85% of dry sample weight. Desirable properties are the high 'plant available' Silica, high water holding content at saturation, low bulk density, low salinity and low trace elements. These properties render Maidenwell diatomite comparable with existing domestic and imported competitor products. With the exception of Moisture Holding Capacity and Bulk Density, the Volcanic Ash is physically and chemically similar to the diatomite.

[79] Melosira are a type of minute photosynthetic algae.

Appendix 3 Glossary

Adit	A horizontal access into a mine, as opposed to a vertical shaft.
Alluvial	Material, sediment transported and deposited by river and stream systems, often by floods onto alluvial flats or plains.
Alumina	Aluminium oxide, the intermediate phase from refining bauxite to smelt to Aluminium metal. See also High Purity Alumina; 99.99 % alumina.
Aluminosilicate	A mineral consisting of aluminium combined with silicate ions and another metal oxide; eg Potassium Feldspar $K_2O.Al_2O_3.6SiO_2$; Kaolinite $Al_2Si_2O_5.(OH)_5$.
Amorphous	Non-crystalline.
Amphibolite	A medium to coarse-grained, high grade metamorphic rock that is composed mainly of green, brown, or black amphibole minerals and plagioclase feldspar. The amphiboles are usually members of the hornblende group. Generally result from the high grade metamorphism of mafic rocks near plate boundaries.
Andesite	A fine grained volcanic rock that is composed of plagioclase, quartz, hornblende, biotite and is intermediate between a basalt and a rhyolite. The fine grained equivalent of diorite.
Amphiboles	Amphiboles or Inosilicates are a group of prism-like minerals, common examples including hornblende. They occur in both igneous rocks of felsic to mafic composition, such as granite, diorite, andesite and gabbro, and in metamorphic rocks.
Apatite	A complex insoluble calcium phosphate mineral with varying amounts of chlorine and fluorine in the lattice. Generally associated with igneous and volcanic rocks. Used for fertilisers.
Aplite	A fine grained igneous rock of granitic composition (quartz and feldspar), often occurring in dykes injected along structural weaknesses in the granitic rocks or the surrounding country rocks.
Asbolite	An earthy mineral aggregate of mineral of cobalt and manganese.
Basalt	A common fine grained dark grey to black volcanic rock with relatively low silica content. Basalt is the volcanic equivalent of coarser grained slower cooled Gabbro.
Basin	A large depression into which sediments, of land, marine and volcanic origin are transported and deposited.
Batholith	A large igneous intrusion of greater than 100km^2 area that has crystallised from molten magna at depth and been exposed by erosion; see pluton.
Bayer Process	Traditional process for converting bauxite to aluminium metal via the oxide, alumina.
Biotite	A dark mica mineral high in iron and magnesium.
Bituminous (sub)	A coal containing a large proportion of tarlike bituminous organic compounds substances.
Boehemite	Aluminium oxide hydroxide, AlO(OH); a mineral common in bauxite deposits. (see also gibbsite)
Breccia	A rock of either volcanic or sedimentary origin, composed of angular broken fragments.
Calcite	Calcium carbonate mineral with the chemical formula $CaCO_3$.
Chert	A micro crystalline form of silicon dioxide (quartz).
Clasts	A clast is a fragment of geological detritus; chunks and smaller grains of rock broken off other rocks by physical weathering.
Cleat	Fracture plane in coal or rock.
Coal Seam Gas (CSG)	Coals seam gas is methane adsorbed in coal beds and released by drilling and dewatering the seams.
Cryptocrystalline	Describes the texture of a rock consisting of crystals that are too small to be seen under a ordinary microscope.
Diorite	A coarse grained igneous intrusive rock composed of, plagioclase feldspar, quartz and hornblende and biotite; lies in between granite and basalt in composition.
Duricrust	A hardened surface layer resulting from the weathering of the crust and the migration of the water table.

Dyke (dike)	A plate-like offshoot from the main igneous intrusion which crosscuts ("is discordant with") the structure of the rocks it intrudes, often along fractures and other structural defects. Sills are intrusive offshoots than are concordant along bedding planes in the country rock. 
Eluvial	Eroded and deposited from the weathering of rock by overland flow but not transported by rivers or creeks as in the case of alluvial deposits.
Epithermal (veins)	Refers to mineral deposits, often gold, deposited at shallow depths by thermal waters at relatively low temperatures and pressures.
EPC(A)	Exploration Permit for Coal (Application).
EPM(A)	Exploration Permit for Minerals (Application).
Extrusive	Extrusive rock, any rock derived from magma (molten silicate material) that was poured out or ejected at Earth's surface.
Felsic	Containing feldspar.
Feldspar/s	A widely occurring group of aluminosilicates occurring as a solid solution series between the end members sodium, potassium, and calcium.
Feldspatholithic sandstone	A sandstone comprising feldspar and lithic (rock) fragments.
FMA	Forest Management Area under the Forestry Act.
Fracking	A method of enhancing the flow of methane (CSG) from a coal seam by fracturing the cleats by injecting a proppant such as a special sand which keeps the cleats open.
Gabbro	A darkish greenish black, coarse grained igneous intrusive rock which is rich in ferromagnesian minerals and has little no or little quartz; the coarse grained equivalent of a basalt.
Galena	A natural mineral form of Lead sulphide (PbS).
Gibbsite	Aluminium hydroxide ($Al(OH)_3$), which, with boehmite aluminium oxide hydroxide AlO(OH), are the main ore minerals of aluminium. Commonly occurs as surficial pisolite (pea) gravels.
Gneiss	A banded metamorphic rock resulting from a remelted granite.
Granite	A common igneous rock, coarse grained and made up largely of quartz and feldspar minerals.
Gondwana(land)	An ancient continent which existed in the Cambrian 550 million years ago and broke up in the Jurassic 180 Million years ago to become Africa, Australia, South America, Antarctica, the Indian Supercontinent, Zealandia and Arabia.
Granitoid	A coarse grained igneous rock composed mostly of quartz, feldspar and mica.
GSQ Lodgement Portal	A service provided by the Geological Survey of Queensland where exploration reports may be searched following registration. Replaced QDEX on 3 August 2020.
Hornblende	A dark to black lustrous prism-like mineral with complex chemistry as an iron-magnesium-sodium-potassium-calcium silicate of the amphibole group. It occurs in range of igneous and metamorphic rocks.
Hot spots	Places in the earth's crust which are superheated by radioactive decay of elements at depth, causing melting below and at the surface and volcanic eruptions.
HPA	High Purity Alumina (Al_2O_3), 99.99 per cent pure alumina used in high tech applications such as I-phones, television screens and LED lights.
Heap leach	Leaching a heap of ore with cyanide solution to extract the gold and precipitate it on carbon.
Heavy Mineral sands	Also called Mineral Sands, or Beach Sand Heavy Minerals, are sand sized grains of resistant minerals, weathered from granitic intrusives, transported along the coastline and deposited in beach and dunes with silica sand. They include rutile, zircon, ilmenite, monazite, and magnetite. Also refers to inland eluvial and alluvial deposits.
High Volatile	A coal with a large proportion of volatile components which can burn and be converted into energy.
Hornfels	A metamorphic rock that has been hardened by heat (from an intrusion) to a new set of minerals but may retain some characteristics of the old rock.
Igneous	Having solidified and crystallised from lava or magma. Igneous rocks are one of three main types of rocks (along with sedimentary and metamorphic).

Ignimbrite	An extrusive volcanic (pyroclastic) rock that has been explosively erupted from a volcano as an ash or fragmental material and remelts and welds as a hot bed on the ground. Often called a welded tuff.
Indurated	The process of hardening a rock through permeating fluids rich in silica.
Intrusion	Igneous intrusions form when magma cools and solidifies before it reaches the surface. Three common types of intrusion are sills, dykes, and batholiths.
Island arcs	A chain of volcanic islands formed on the edge of a marine plate colliding with another plate and causing crustal melting at depth and surface volcanic activity. Modern day examples include the Aleutian Islands.
Jasper	An opaque form of microcrystalline or cryptocrystalline silicon dioxide, generally red or brown because of iron impurities.
JORC reserves	Reserve estimate which complies with the Joint Ore Reserves Committee guideline of 2012.
Kaolin clay	A clay (china clay) composed predominantly of Kaolinite.
Kaolinite	A clay mineral composed of aluminium and silica which is the major component of kaolin clay or "china clay" used in the manufacture of china; also used extensively in paints and glossy paper.
Leucocratic	Light coloured, usually referring to a rock composed of light coloured minerals such as plagioclase and quartz.
Lherzolite	A coarse grained ultramafic rock consisting largely of olivine and pyroxene, having its origins deep within the earths crust from the upper mantle.
Lime, limestone	Calcium oxide produced by roasting limestone (calcite, calcium carbonate) in lime kilns; a rock composed of the mineral calcite formed from the skeletons of animals or precipitated inorganically.
Lithic/s	Lithic fragments, or lithics, are rock fragments from an earlier rock within a rock that are distinct from the individual mineral components.
Macerals	The microscopic organic components which make up coal. They are analogous to the mineral components of an igneous or metamorphic rock.
Mafic/Ultramafic	Dark coloured rocks dominated by silicate minerals high in magnesium and iron (mafic) such as amphiboles, pyroxene, biotite.
Magma	Molten rock within the earths crust; source of igneous intrusions and volcanic extrusions.
Meta	A prefix for rock which have undergone metamorphism. Eg: metasandstone, metavolcanics etc.
MDL(A)	Mineral Development License (Application).
Metamorphism	The process by which heat and pressure in the earth alters the mineral components of a rock to produce a new rock over time both mineralogically and texturally.
Metasomatic (pyro)	Change in the mineralogy of a rock due to hot circulating fluids, often originating from an igneous intrusion.
Mica	A silicate mineral known as a sheet silicate as it forms in distinct layers.
Migmatite	A metamorphic rock resulting from the mixing of two intermingled but distinguishable components such as a granite and a metamorphic rock.
Ml	Megalitres or million litres.
ML(A)	Mining Lease (Application).
Monzonite	A medium to coarse grained igneous rock with less quartz than a granite and equal amounts of plagioclase and potassium feldspar.
Olivine	Magnesium iron silicate mineral.
Orogen	A section of crust built up into mountains by the collision of two or more crustal plates.
Palaeozoic	Epoch extending from Cambrian (560 million years) to Permian (250 million years).
Pegmatite	A rock or vein of coarse grained minerals crystallising at the final stage of a magma cooling, and comprising elements which did not form minerals at higher temperatures. Common pegmatite minerals include quartz, feldspar, mica, hornblende, calcite, and metallic sulphides such as pyrite, galena, etc. Lithium mineral spodumene is a common pegmatite mineral.
Plagioclase	A member of the feldspar group, is a framework silicate.
Plate extension	When crustal plates are moving away from each other causing an intervening depression or basin where sediments are deposited.

Plugs	Volcanic plugs are intrusions into the earth's crust which did not reach the surface at time of crystallisation but have been exposed by later erosion.
Pluton	A large igneous intrusion which crystallised before reaching the surface initially but was subsequently exposed by erosion. A batholith is greater than 100 km^2 and a stock is less than 100 km^2.
Polymetallic	Containing a mixture of metallic minerals.
Polymictic	Containing a number of types of clasts or rock fragments in a finer grained matrix.
Porphyry, Porphyritic	Igneous rocks with large crystals in a finer grained ground mass.
Potash	Mined or manufactured forms of potassium in a soluble form used as a fertiliser.
Primary gold (ore)	Primary gold ore is generally sulphide ore in which the gold is mixed with sulphides and more difficult to extract. Secondary ore refers to oxidised ore from which the gold is more easily released.
Proppant	A solid material such as sand, or ceramic material designed to keep a hydraulic fracture open. Used in Fracking.
Pyrite	An iron sulphide commonly known as "Fools Gold."
Pyroclastic	Composed chiefly of fragments of volcanic origin. Eg. Tuff.
Pyrometasomatic	See metasomatic.
Pyroxene	Pyroxenes are a group of dark-coloured rock - forming minerals found in igneous and metamorphic rocks. An example of a pyroxene mineral is spodumene, which occurs in colourful, gem quality crystals.
QDEX	Queensland Exploration Database. Replaced on 3 August 2020 by GSQ Lodgement Portal. The service provides access to reports following registration.
Quartz	A hard crystalline mineral composed of silicon and oxygen.
RCP	Reverse Circulation Drilling in which water is circulated through the drill head and recirculated back to the drill rig.
Rare Earth Elements	The Rare Earth Elements (REE) are a group of chemical elements that exhibit a range of special (some unique) properties which are used in many modern and "green" technologies. The Rare Earths are defined as the 15 lanthanides together with yttrium and scandium.
Schist	A medium grained, medium-grade metamorphic rock characterised by the parallel arrangement of platy minerals (foliation) such as mica, biotite, chlorite, and formed from fine grained rocks such as mudstone, shale, and siltstone.
Serpentinite	A metamorphic rock composed largely of the mineral group serpentine which originates in the mantle and has been forced to the surface by crustal impact. Often elevated in nickel and cobalt.
Skarn	A metamorphic rock that has been metamorphosed/ altered by hot fluids from an igneous intrusion; often originates from carbonate rocks such as limestone or dolomite.
Supergene enrichment	The dissolving into solution, transport, and redeposition of metals by low temperature waters below the oxidised zone of a mineral deposit, resulting in higher grades, eg. copper.
Tectonic; tectonism	Pertaining to the structure of the Earths crust and changes thereof.
Tonalite	A medium grained igneous intrusive rock of similar composition to a granite, but with feldspars represented by plagioclase.
Tuff	A volcanic rock explosively ejected from volcano as airborne ash.
Ultramafic	A group of rocks which exhibit a chemistry undersaturated in respect to silica (silicon dioxide less than 45 percent) and greater than 90 percent dark ferromagnesian minerals (see mafic).
Upper mantle	Extends from the crust of the earth to a depth of approximately 410 km. It includes the lithosphere.
VRFB	Vanadium Redox Flow Batteries, a relatively new form of battery which works from vanadium pentoxide liquid in different oxidation states. Potential use for the storage of renewable energy.
VTEM	Versatile Time Domain Electromagnetic surveys, helicopter borne deep penetrating geophysical surveys.
Volcaniclastic sediments	Sediments composed of clasts (fragments) of recent volcanic origin.

Volcanoclastic	Transported fragments of volcanic origin.
Volcanogenic	Of volcanic origin.
Wehrlite	A coarse grained ultramafic rock composed largely of olivine and clinopyroxene; similar to lherzolite of deep-seated origin in the upper mantle. Often associated with gabbros and serpentinitic bodies.

Appendix 4 Terms of Reference

Wide Bay Burnett Minerals Region Investment Attraction Project Proposal

Introduction	The outputs of this project will validate and promote the Wide Bay Burnett Minerals Region (WBBMR) resource and investment potential. This is an action of the Activating the WBBMR two-year plan endorsed by the Wide Bay Burnett Resources Group (WBBRG). The target audience will include: - private sector investors (exploration, mine development, and processing investment targets including customers seeking security of supply) - government stakeholders at all levels (regional development opportunity, common user infrastructure demand) - the community, increasing their awareness of the opportunities, and to gain their support
Rationale	The WBBMR is where small minerals projects are large regional opportunities. The resource sector provides the region and Queensland the potential to diversify the economy and drive growth in direct employment and expanded supply chains. It has been some time since the region had a significant mineral discovery. Without this, the region has struggled to capture the attention of private sector investors and government. The contribution of existing mines to regional and state economies is understated and has low public awareness. The endowment of the region in a diverse range of minerals is not in question. The viability if specific prospects is less certain. Viability is measured not just by ore body grade and scale, but is also the potential to be globally competitive producers. Typically, prospective projects lack the scale to overcome first mover costs and explorers require support to bring forward the field work required to confirm discovery. Access to limited government funding is very competitive and requires a sound business case. Planning and investment into enabling infrastructure requires raising the profile of the resource sector's potential in the Wide Bay Burnett Region. Collating and describing this potential will form the basis of an investment attraction strategy. It will also outline a proactive approach to capturing the attention and engaging with the target audience.
Objectives of the Project	The objectives for the project are to: Build on previous studies and other available information sources to collate an evidence base to summarise the investment potential of the WBBMR and use this to inform the development of an investment attraction strategy.

	• qualify the potential and competitive advantages of the WBBMR • identify the current and future targets for investment in the WBBMR (exploration, mine and enabling infrastructure) • identify potential investor types (private and public) as the audience of an investment strategy • develop a strategy to engage potential investors.
Project Specifications and/or scope of works	The stages of the total project are: • **Stage One** –Develop an understanding of the regional geology referenced by historical and current exploration and mining activity relative to future global demand drivers which includes critical minerals. • **Stage Two** – Identify and describe specific investment targets while building on outcomes of stage one. • **Stage Three** – Building on the previous stages, develop a targeted investment attraction strategy including marketing resources (not included in this EOI) **Requirements for this EOI:** **Stage One –** Develop an understanding of the regional geology referenced by historical and current exploration and mining activity relative to future global demand drivers which includes critical minerals. Requirements will include: • At a high level, geologically describe the WBBMR based on pre-competitive geoscience data • A desktop review of previous reports and data to provide an historical and current summary of exploration and mining activity in the WBBMR. • With relevance to the diverse range of minerals of specific grades found in the region (eg: low temperature bauxite), analyse the overarching supply/demand drivers for each including critical minerals. • Coking and thermal coal and natural gas are in scope. • Develop a matrix of factors by which exploration and mine development projects could be described in non-expert language to provide a summary of the resource and investment potential. • Select the most prospective **10** exploration and **8** mine development projects which may include, as a criteria, the current level of activity of exploration or mine development by the proponents. The project list will be approved by the PSC following advice provided by the contractor. • Mine development projects may include green and brownfield sites. • Thermal coal and natural gas projects are out of scope, coking coal projects may be considered

	Stage Two –Identify and describe prospective investment targets in non-expert language while building on outcomes of Stage 1. • Using the matrix as the assessment and reporting mechanism, independently describe the projects approved. • The information used to populate the matrix will be limited to desktop sources including that published by exploration and mining companies. • For clarity, the assessments made will **not** attempt to determine project viability or rank projects. • In addition to the matrix, describe the key positive attributes and challenges of each project. In addition: • Identify the enabling common-user infrastructure that could be critical to a number of prospective mine development projects on the basis that they will also require investment. • Provide the basis of why they are deemed important. • Identify common-user infrastructure investment opportunities that could be enabling to prospective mine development projects.
Deliverables	• A map which marks the location of the 18 projects and the identified enabling common-user infrastructure. • Draft and final report which in non-expert language responds to the objectives of Stages 1 and 2 as described in the Specifications and Scope of Works. Report available in digital form. • A presentation to key stakeholders in Brisbane
Project Management and governance	Governance and project management will be undertaken by Wide Bay Burnett Regional Organisation of Councils (WBBROC). Project partners will provide direction through a Project Steering Group. It is planned that the Project Steering Group members will include major financial partners, other stakeholders that contribute in-kind support to the project and an industry representative.
Budget	Positive commitments have been received from three project partners. This level of support for the project does require an additional 40% contribution from other members of the Wide Bay Burnett Resource Group.
Project timeframe	It is planned to have the project's professional contractor appointed by 30th April 2020, with the aim to have the project completed by 30 June 2020.