

# Gold : Kalamazoo Resources Ltd (KZR)

Reviewing the Extensive data plus new Geology info before Drilling : March 2019 Site Visit to Castlemaine Area KZR (at A\$0.125) with a Mkt Cap of ~\$11m & est ~\$6m Cash : Rated as a SPEC BUY (Target >\$0.25)

In early March 2019, ERA attended a presentation by Kalamazoo (KZR) at the Melbourne Mining Club, followed the next day by a short visit to KZR's Castlemaine Project. This report has been based on available historical information and presentations made by Kalamazoo and Kirkland Lake. KZR acquired its wholly owned (100%) Castlemaine Project (centred on the Wattle Gully EL tenement and adjacent EL application shown in Figure 1a) from the Victorian Mines Dept in June 2018 for "minimal expense" after Liongold dropped it in 2017 for failing to meet stipulated Victorian Mines Dept expenditure requirements.

 Figure 1. Location Plan of KZR's Main Prospects at Castlemaine, and Broad Geological Plan of Castlemaine Area

 a. Location Plan of KZR's Main Prospects at Castlemaine

 b. Geological Plan of Castlemaine to Fosterville Area



Kalamazoo (KZR) is currently rated by ERA as a SPEC BUY at \$0.125, with a target of >A\$0.25

The key points from the site visit, presentations and historical information are :

- The Castlemaine Goldfield has a historic reputation for being the richest alluvial gold field in Victoria due to producing >800koz in 1852 and ~400koz in 1855, for ~5.2Moz from alluvials/near surface; and 0.36Moz later at >10g/t underground from Wattle Gully between ~1937 and 1969, but apart from Wattle Gully it appears to have largely remained dormant for ~110 years since ~1910.
- Liongold acquired Castlemaine Goldfields (CGT) in 2012 for ~\$55m. CGT then consisted of holdings in a number of Victorian goldfields such as Ballarat (which it had acquired from Lihir for \$10m in 2009), Castlemaine, Tarnagulla etc. JORC 2004 inferred resources were then quoted for Castlemaine of : 2.1Mt @ 8.3g/t for 574koz at Chewton [based on 17 drillholes over 700m] & 610kt @ 5.7g/t for 112koz in remnants of the old Wattle Gully mine; (& for Ballarat : 160kt @ 9.5g/t for 48koz).
- In JQ 2009 the Chewton component of the Castlemaine Project was valued at \$66m (pre-tax), applying a 15%NPV in an independent scoping study based on a gold price of A\$1200/oz, total cost of ~A\$650/oz, treating 270ktpa @ 8.3g/t for 8 years (including development) to produce ~335koz.
- Some of the reported intersections in 2008 (~5km to 10km north of Chewton/Wattle Gully) were:
  0.8m @ 13.1g/t from 46m in the Pine Plantation (PP), 7.1m @ 22.9g/t from 333m in the Shicer fault (in the PP), 2.5m @ 64.4g/t & 0.8m @ 121g/t at North Quartz Hill; and Cappers : 5m @ 10g/t from 14m, 0.6m @ 540g/t from 52m, 0.8m @156g/t from 142m and 0.8m @ 54g/t from 310m.
- Wattle Gully (& Chewton) visually appears to have structural similarities to Kirkland Lake's Fosterville, being a stacked fault system with faulted offset anticlines and synclines.
- The Castlemaine goldfield has a major advantage when compared to many other Victorian gold explorers as its mineralisation extends to near surface with little cover, whereas further north, the mineralisation is hidden under the Murray Basin sedimentary cover (as shown in Figure 1b).
- KZR is undertaking a number of studies before it commits to drilling using part of the war chest from its \$7m sale of Snake Well: including IP, an agreement with CSIRO, plus reviewing the extensive database (that includes ~80km of diamond drilling), and historical company studies.

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## **Corporate Summary**

This is our first report on Kalamazoo Resources Limited (KZR) whose share price has recovered back up to 12.5c. Kalamazoo is fairly tightly held with a major shareholder (Doux Argent) holding 44.8% and the top 20 ~67%, for its **89.5M shares** on issue. There are also **29.4m out-of-the-money options** of which 2.9M fall due @ 20c in November 2019 and 12.3M @ 30c in December 2019.

## **Background History**

Although gold was reputedly found in the Castlemaine area from 1847, the discovery was credited to John Worley and Christopher Peters at Specimen Gully, Barker's Creek (near the northern boundary of KZRs EL006679) in July 1851, with the gold rush occurring in November at Forest Creek (renamed Chewton in 1856) and Fryer's Creek (which became Fryerstown). The mining population apparently rose to ~10,000 and later ~30,000 as an alluvial or quartz miner's right/claim was limited to an 8ft x 8ft area (~2.4m x 2.4m), resulting in numerous old workings, shafts, gullies, partly filled in etc (and now wooded as in Figure 2a).

Most of the initial gold was alluvial or in near surface oxidised/transitional quartz, with 94.5koz produced in DQ1851 soaring to **~843koz** officially transported (by gold escort deliveries) **in 1852** to Melbourne and Adelaide. Followed by 467koz (1853), 360koz (1854), 400koz (1855) & still relatively high at 235koz in 1861, before the 1862 floods reduced it to ~157koz in 1863, **being ~4.1Moz in just over 10 years** from discovery. Puddling or reworking the gullies had already started in 1855 and by 1856 with the population at >34,000, there were 23 steam engines, 140 puddlers and 36 quartz crushing machines, but *wood supplies began to dwindle* and were being transported from ~30km away by ~1890, when the field began to materially close.

The perception of Castlemaine being the richest alluvial goldfield in Victoria was based on those early returns with hard rock mining occurring from ~1854 and to some degree even in 1851 (eg at Quartz Hill). Some of the initial grades were extreme at >100oz/t, and were not limited to just the early years with Nuggetty Reef realising 68oz/t in 1856 & still producing ~15oz/t in 1859 (over 4t to 5t). Eureka was opened in 1854 with 300 claims that reputedly yielded ~20oz/t, with part of Cappers yielding ~60oz/t in 1856, while Wattle Gully started at 12oz/t from its "alluvials" to a depth of 25ft to 30ft in 1852, with one of the claims reporting a recovery of 935oz from 4tons. In 1859 Wattle Gully Mining was formed from combining 19 claims, and began mining the Phillips reef which had been discovered initially as spurs under the "alluvials".

Most of the small mines on the >40 known Castlemaine reefs gradually closed due to : water inflow (at ~70ft to ~150ft), a fault, a switch from dipping west to dipping east, or the broad northerly plunge of the mineralisation. Those that combined claims went to deeper levels such as Fraser Ormond (377ft), Eureka (460ft), Spring Gully and Garfield (~890ft). Wattle Gully went to ~1100ft (330m or ~12 Level - after 1933). Reef mining peaked in ~1870, as grades gradually reduced to 0.5 to 1oz/t and then lower ~0.3 or ~10g/t, with the miners attracted to other goldfields and almost complete closure from reducing manpower for WWI, resulting in production from Castlemaine of ~5.2Moz.

Figure 2. Cappers and Eureka Areas, & Wattle Gully 1981 Section, and Wattle Gully Plant and Shaft / Headframe a. Cappers and Eureka Areas & Wattle Gully 1981 Section b. Wattle Gully Plant and Shaft / Headframe



Wattle Gully GM IPO'd in 1933 and after receiving encouragement mining ore at ~40g/t, drilled a hole from the 196ft level and apparently intersected ~5oz/t in what was to become the Wattle Gully Reef on the WG Fault. The shaft was sunk deeper passing through the orebody at ~500ft, and continued to 800ft and then 1100ft, as shown in Figure 2a. The stamp battery was replaced by the current 20-head one seen in Fig 2b. Treatment rates were ~15 to 25ktpa at 0.5 to 1oz/t, falling to 0.3oz/t or ~10g/t to 11g/t from 1940, with production stepping up to 30 to 45ktpa from 1955, and the **mine closing in 1968/9** due to rising costs and a relatively low gold price, after producing ~360koz from 1933, with the reef shaft pillar later mined in 1971.

The history for Wattle Gully from 1979, shows possibly ~35koz production **(to total 5.6Moz)** as it passes through a number of farm-ins from CRA, to Newmont, Newmont Australia/Newcrest, Cons Vic, Duketon, Cluff, Yukon, Mt Alexander Goldfields, Austindo & Alexander Resources (with various exploration models targeting different areas, a decline sunk ~180m to 4 Level, and a 100ktpa plant). In 2006, it was Castlemaine Goldfields (CGT) with Gary Scanlan (ex-NCM) as MD and 11 planned 220m to 550m deep drillholes on a

number of targets applying a new exploration model which resulted in *many double-digit grade* intercepts (see page 1 of this report), starting in *Sept 2006 with 0.7m @ 28.9g/t, 45m downhole at Chewton.* 

A scoping study was completed in JQ09 with 3d modelling focusing on Chewton-Wattle Gully (CWG), Quartz Hill and Cappers. Further encouraging double-digit grades were reported, but the company was taken over in a Liongold scrip bid in 2012. Initial drilling occurred, but Liongold focused on bringing Ballarat back into production, with Castlemaine effectively dropped in 2017 – and then picked up by Kalamazoo. So apart from Wattle Gully between 1933 and 1969 focusing on one main structure, **nothing has really happened at Castlemaine since 1910, possibly even earlier ~1900 ie almost 120 years' ago.** (It should be noted that there is a surface restriction to the area shaded light green in Figure 1a that relates to the Diggings National Heritage Park that was proclaimed in 2002, for which "Parks Victoria" has responsibility for the top 100m).

#### Geology

Like most of the western Victorian goldfields in the Ballarat to Bendigo area, the geology at Castlemaine consists of a tightly "concertina-like" folded sequence of Silurian sandstones and shales in which the anticlinal axes strike NS and have often been drawn as a series of almost parallel tram-lines, containing the reefs as shown in Figures 1a and 1b. There are also broadly NS striking faults, with the mineralisation often associated with faults and shales, although gold mineralisation at Castlemaine has been found in quartz, shale/slate and sandstone. Sometimes marker horizons were used based on graptolite fossils.

Figure 3. View of Quartz Hill Sidewalls and Castlemaine Reef Types, and Wattle Gully Exposures & Specimens a. View of Quartz Hill Sidewalls and Castlemaine Reef Types b. Wattle Gully U/ground Exposures & Specimens



The classic styles of gold mineralisation at Castlemaine are shown in Figure 3a, plus folded strata dragged into a NS striking fault at Quartz Hill and spur mineralisation on the western wall. The rock assemblage is shown in Figure 3b with carbonate in quartz (quartz-carbonate veins are the main host for visible gold at KLA's Fosterville – per the December 2018 NI 43101); shale, slate, some mafic rocks (basalt?), & granite (also seen).





However, it is the structure of Wattle Gully that has attracted market attention with stacked faulting and faulted offset anticlines and synclines as shown in Figure 4a (in both GSR 106 in 1995 and 121 in 2002), both characteristics of which appear comparable to Kirkland Lake's (KLA's) Fosterville as shown in their presentations and at OREAS Victoria in November 2018. While Figure 4b shows the increased understanding of KLA's Fosterville at depth, possibly Wattle Gully's mineralisation that was delineated and mined to 1969 does resemble upper Fosterville (eg Osprey), and deeper drilling may solve the comparison.

However, KZR is **not solely reliant** on Wattle Gully, as shown in Fig 4b of a conceptual EW cross-section in August 2018 that was apparently contained in CGT's MQ2007 report. Stacked faulting has also been reported at Chewton, and faulted offset anticlines/synclines at Spring Gully & Fryers Creek. Added to which the mineralisation lies in quartz, sandstone, shale and slate, *whereas the drill core appeared to have been selectively assayed* (as shown inset in Figure 2b, it mostly appeared to be quartz in the trays that ERA saw).

Apart from reviewing the extensive database, KZR intends to apply a number of geological exploration techniques to prioritise the areas and depth targets for drilling – initially being IP and drone aeromag (the sandstones may contain minor magnetite). This is the first time since the 1960s that "**modern**" geological techniques are being applied to Castlemaine such as drone aeromag, the recently announced venture with CSIRO focusing on geochem gradients and alteration associations, and ground geophysics. There could be material **upside potential**, especially if the adjacent tenement (EL006752) in Fig 5a receives approval.

Figure 5. Chewton-Wattle Gully Targets and Regional Potential, and Exploration Potential in the Cappers Vicinity a. Chewton-Wattle Gully Targets and Regional Potential b. Exploration Potential in the Vicinity of Cappers



There are also a number of near surface targets, especially in the unrestricted (as in the top 100m is not part of the Diggings NHP) Pine Plantation area such as at Cappers as shown in Figures 1a, 2a and 5b, with intersections on structures without marked shafts such as 2.5m @ 71g/t in possibly laminated quartz, or potentially completely unknown structures such as 0.78m @ 156.3g/t shown as visible gold on a quartz/shale boundary. As the background history shows, mining post 1933 mainly focused on Wattle Gully, and exploration followed a number of different models (including Cappers).

#### **Other Exploration Targets**

Kalamazoo does have other exploration target areas in Western Australia, being ~50km west of Sandfire's Degrussa in its Cork Tree Copper Project Area as shown in Figure 6a, and gold in the Pilbara in Figure 6b.

Figure 6. KZR's Cork Tree Copper Project near DeGrussa, and Possible Gold Potential in the Pilbara of WA a. KZR's Cork Tree Copper Project near DeGrussa b. Possible Gold Potential in the Pilbara of WA



## **Financial Considerations**

KZR had net cash at 31 December 2018 of \$0.5m, having received \$150k of the \$7m sale of its Snake Well gold project. A further \$1.35m was paid in February and a \$0.625m royalty refunded to Atlas (AGO). Another \$0.5m is expected to be received by 30 June 2019 & \$1m by 31 December 2019, plus \$4m in 2020 - although exploration drilling up to \$4m can be used/applied earlier and offset against the amount owing.

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Board		Exec Chairman & CEO	Luke Reinehr	Mgt	Exploration Mgr - Eastern Australia :	Luke Mortimer	Kalamazoo Resources Ltd (KZR) 0.1 15 April 2019 at \$0.125	3 M 🚎
		Non-Exec Director :	Paul Adams		Exploration Mgr - Western Australia :	Lance Govey	0.12	0.11-
		Non-Exec Director :	Angus Middleton		Company Secretary :	Bernard Crawford	A MA A J'Mmm	0.10-
Mkt Ca	р	A\$11.2m (at \$0.125)		Tel :	+61 (0) 3 9988 9007			0.09 0.08
Net Cas	sh (31 Mar 19)	~A\$6m (ERA Est realisa	able)	Website :	www.kzr.com.au		May Jul Sep Nov Jan	0.07 Mar

#### Disclosure

Kalamazoo Resources Limited commissioned Keith Goode (who is a Financial Services Representative with State One Stockbroking Ltd ACN 092 989 083 and is a consultant with Eagle Research Advisory Pty Ltd ACN 098 051 677) to compile this report, for which Eagle Research Advisory Pty Ltd has received a consultancy fee. At the date of this report Keith Goode and his associates held interests in shares issued by Kalamazoo Resources Limited. At the date of this report, State One Stockbroking Limited or their associates within the meaning of the Corporations Act, may hold interests (while Keith Goode and his associates at the time of this report held interests of : KG~30k@\$0.12, KSSuper ~100k@\$0.106) in shares issued by Kalamazoo Resources Limited.

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