

## WHITE PAPER on the VICTORIA GOLDFIELDS: Two Paradigms (so far)

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“the brownfields can contain blind worldclass deposits” Ross Cayley, GSV

### History

The discovery of gold at Ballarat in 1851 set off a gold rush in Victoria, in which an estimated 6,000 diggers arrived each week. In the 1850s, a third of the world’s gold production came from Victoria. The greatest part of that production was alluvial gold, with some from near surface leads or shallow reefs.

Victoria, Australia’s smallest state, has produced over 2400 tons of gold, which is 32% of all the gold mined in Australia.

The source for the gold of the Victoria Goldfields is thought to be the 35km thick layer of fertile metamorphic rocks that underlies it. At a depth of several km, and temperatures between 300 and 550 degrees centigrade, seismic and other events enabled the mobilisation of large volumes of fluid into new environments where their altered gold equilibrium led to gold deposition out of the fluid.

Some of these deposits have been unroofed and wholly or partly eroded, creating the alluvial deposits that were the prime target in the 19th century.

By the 1920s the mines in the great Goldfields centres of Bendigo and Ballarat had ceased production, and there was a sixty year hiatus, with gold production in 1972 dropping to 10kg or 320 oz for the entire state. Even by 1986 it was only 32,000 oz.

In 2005 commercial mining began at Fosterville east of Bendigo, and by 2011 500,000 oz had been mined there, and by 2016 another 500,000 oz. In 2016 **Kirkland Lake Gold (TSX:KLG), C\$58.78 from C\$3 in 2016, market capitalisation C\$18bn**, took over and drove exploration deeper, with increasing grade at the deeper levels. In the first quarter of 2020 production from this one mine was 175,000 oz at an extraordinary 41 g/t, with Reserves mapped to a depth of 1400m below surface.

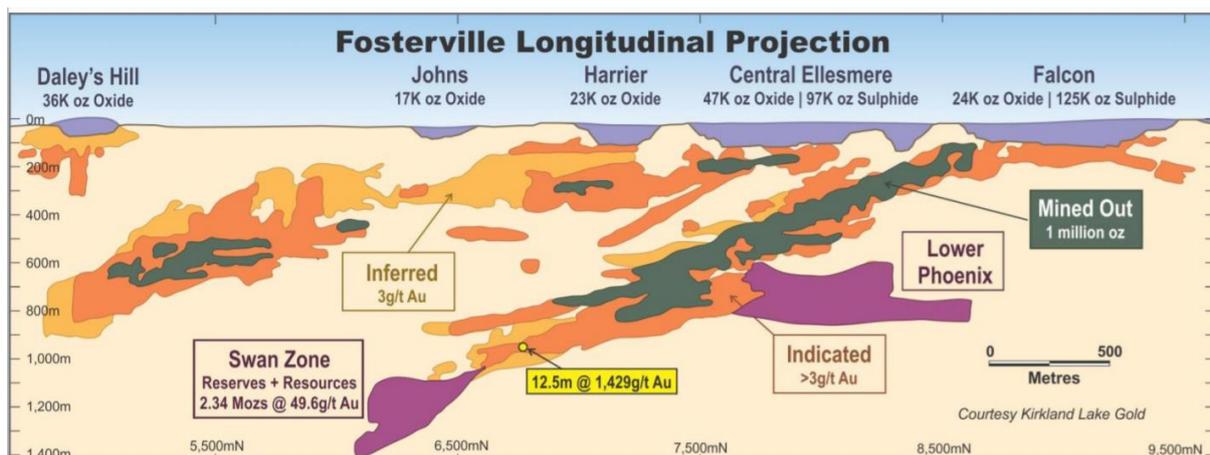


Fig 1. Fosterville schematic [source: Catalyst Metals Ltd]

In 2011 underground gold mining began again at the **LionGold Corp.**-owned Ballarat mine (**SGX:A78**), **S\$0.001 from S\$0.003 in 2016, market capitalisation S\$32m**, and in early 2019 Arete Capital re-opened the Stawell gold mine in a gold trend to the west of the Goldfields.

### Under Cover, Bigger, Deeper – the Land Grab for the North

The opening of the Fosterville Mine and its development into deeper zones demonstrated the potential for deeper resources below the surface or near-surface oxides mined in the gold rush. Another change was the improved structural understanding and better geophysics technologies available for looking below the surface and interpreting the results. This was important in an area of complicated geology with much folding and many slip-faults and shears.

Historically, all gold production in the region has come from fields with outcropping geology, where signs of mineralisation are easy to find, such as Bendigo (~22Moz @ 15g/t Au); Ballarat (~14Moz @ 12g/t Au) and Castlemaine (~6Moz @ 13g/t Au).

The Victoria Government to stimulate interest published a series of studies including airborne surveys. One important set of studies was the 20 “Gold Undercover Reports” series beginning in 2007 that provided gravity data and drew attention to the prospects for gold mineralisation in the extensions of the goldbearing faults and structures to the north of Bendigo where in the northern part of Victoria outcrop is replaced by sometimes deep cover in the Murray Basin up to the state boundary, the Murray River.

The "Gold Undercover" initiative estimated a potential ~32Moz (P50 mid case) of undiscovered gold beneath Murray Basin cover in the northern Bendigo Zone.

Parameter	P90	P50 (mean)	P10
No. of significant goldfields undercover	15	25	32
Undiscovered gold endowment (Moz)	9	32	58

This model was created prior to the epizonal ultra high-grade gold discovery at depth at Fosterville, hence is likely to be conservative. It was sufficient to lead however to companies pegging the cover to the north, sometimes with huge license areas. **Catalyst Metals Ltd (ASX:CYL), \$2.83 from 9c in 2010 and under 50c in 2016, market capitalisation A\$224m**, holds some 75 km of the Whitelaw Gold Belt north of Bendigo along the Whitelaw fault. This fault may, Government seismic and gravity data suggest, have played an important role in the formation of the Bendigo deposits that have produced 22m oz of gold. The Tandarra discovery in 2005 and Gold Eagle discovery in 2010, both at advanced exploration stage, have vindicated Catalyst’s hypothesis that rich deposits are to be found along this Whitelaw corridor.

Limited undercover exploration by previous explorers over the last two decades had confirmed the Bendigo Zone geology extended to the north, however the limited exploration presented a significant opportunity for new large-scale, high-grade gold discoveries.

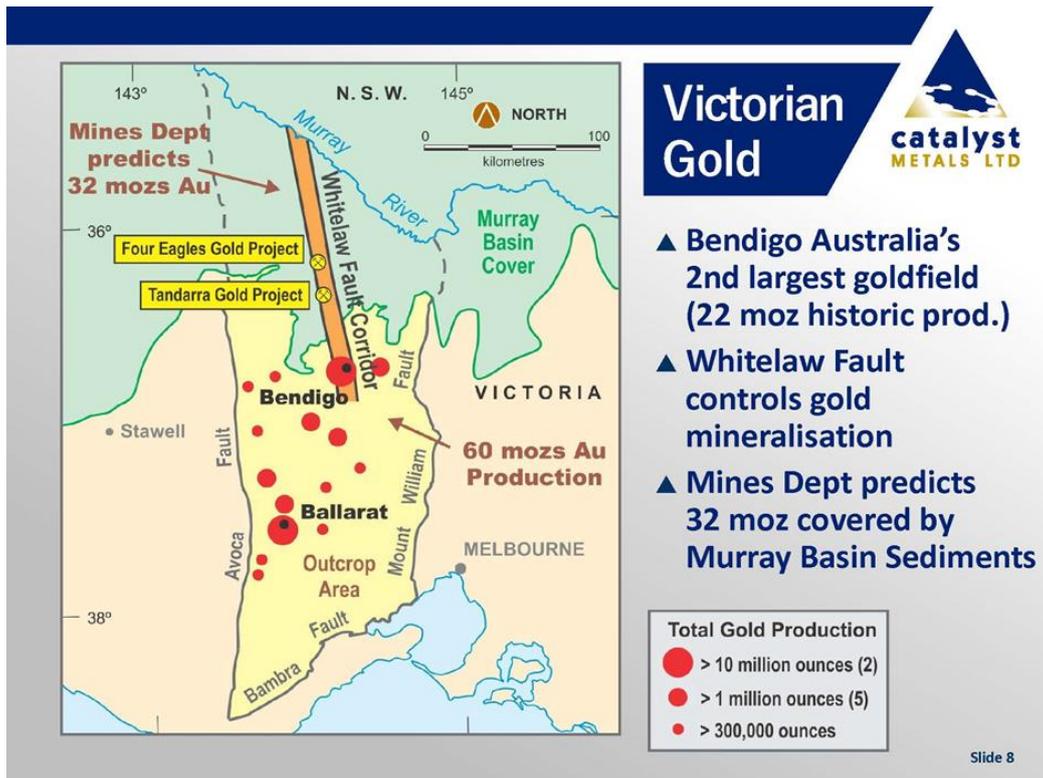


Fig 2: Catalyst gold discoveries under cover N of Bendigo [source: Catalyst Metals Ltd]

*“Catalyst believes that other high grade gold deposits are likely to occur along the Whitelaw Gold Belt because it is mostly covered by Murray Basin sediments which vary in depth from 10 metres to 120 metres. This means that the area has never been tested by historic prospectors and has also had very limited exploration drilling by modern explorers. The potential of the Whitelaw Gold Belt was not fully realised until the Victorian Government “Gold under Cover” initiative in 2006 which used updated gravity data to show the location importance of the Whitelaw Fault. The virgin discovery of the Tandarra gold mineralisation by Leviathan Resources Pty Ltd in 2006 and the Four Eagles gold mineralisation by Providence Gold and Minerals Pty Ltd in 2010 further confirmed the potential of the whole belt. Catalyst has consolidated tenement holdings along this belt so that it can participate in any future gold discoveries.”*

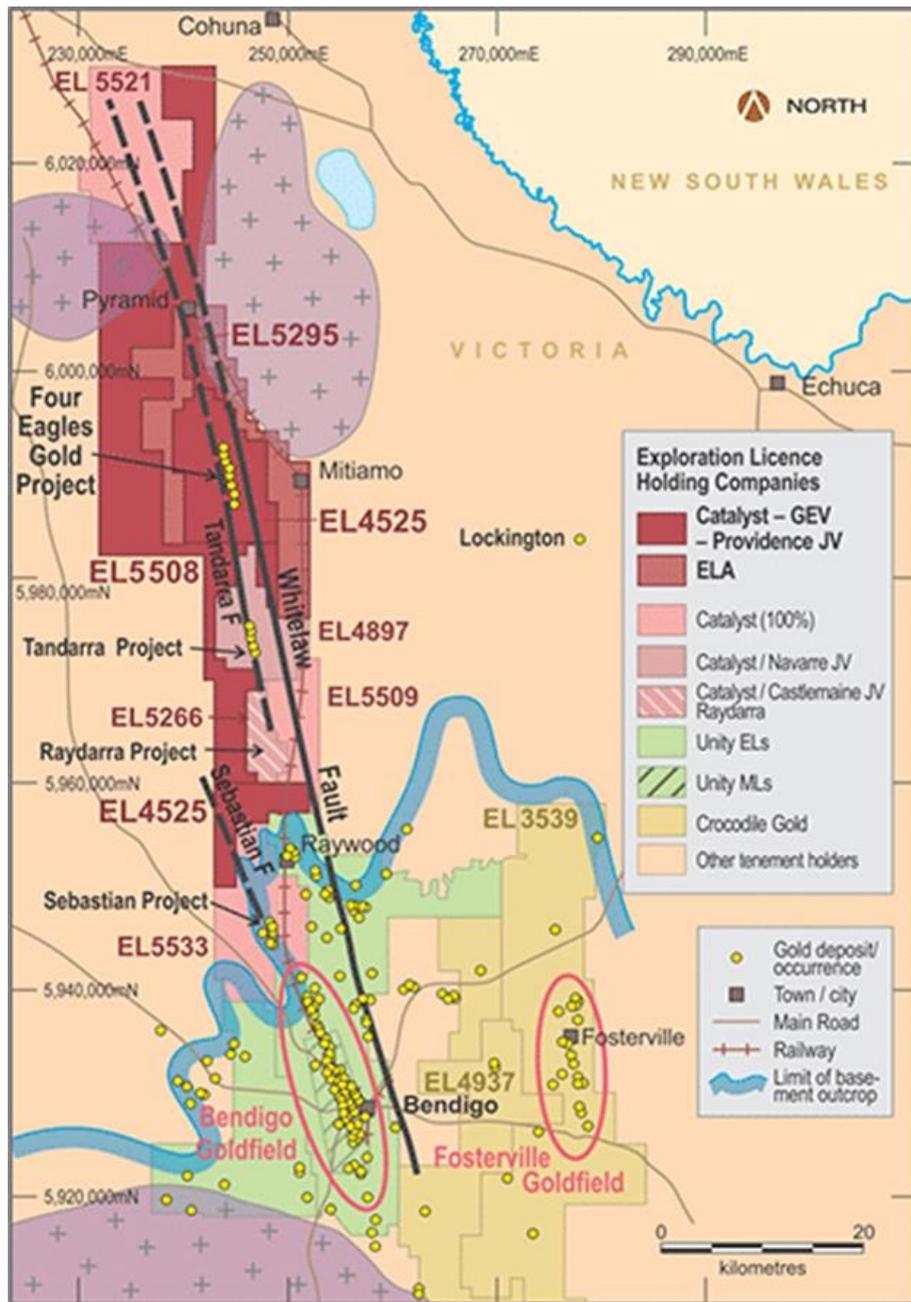


Fig 3: Catalyst tenements under Fraser Basin cover, Whitelaw corridor, N Victoria [source: Catalyst Metals Ltd]

Catalyst describes its aim as to “dominate the region” and “manage the entire Whitelaw Gold Corridor”. Catalyst also has holdings across the Drummartin and the major Redesdale fault systems that run south into the Fosterville area.

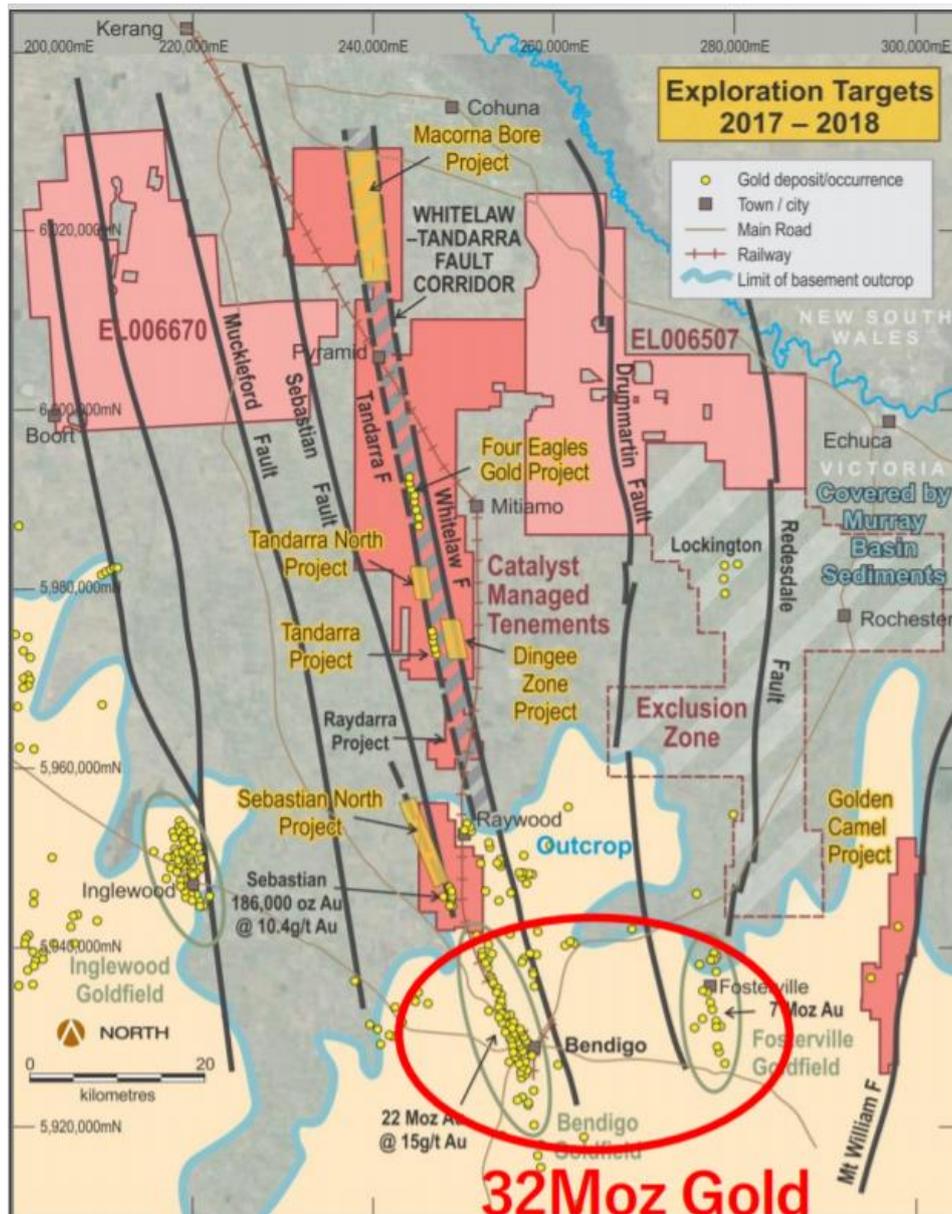


Fig 4: Catalyst tenement position showing regional faults [Catalyst Metals Ltd]

**Chalice Gold Mines Ltd (ASX:CHN), \$1.195 up from 8c in 2016, A\$308m market capitalisation,** holds 'district scale' holdings of 5,190 sq km to the west and east of Catalyst, which is some 60% of all the northern Bendigo undercover zone. Despite its higher capitalisation, its exploration is at an earlier stage.

Chalice states that "Chalice's flagship asset is the 100%-owned Pyramid Hill Gold Project, a commanding >5,000km<sup>2</sup> land holding in the high-grade and essentially unexplored northern Bendigo gold district of Victoria."

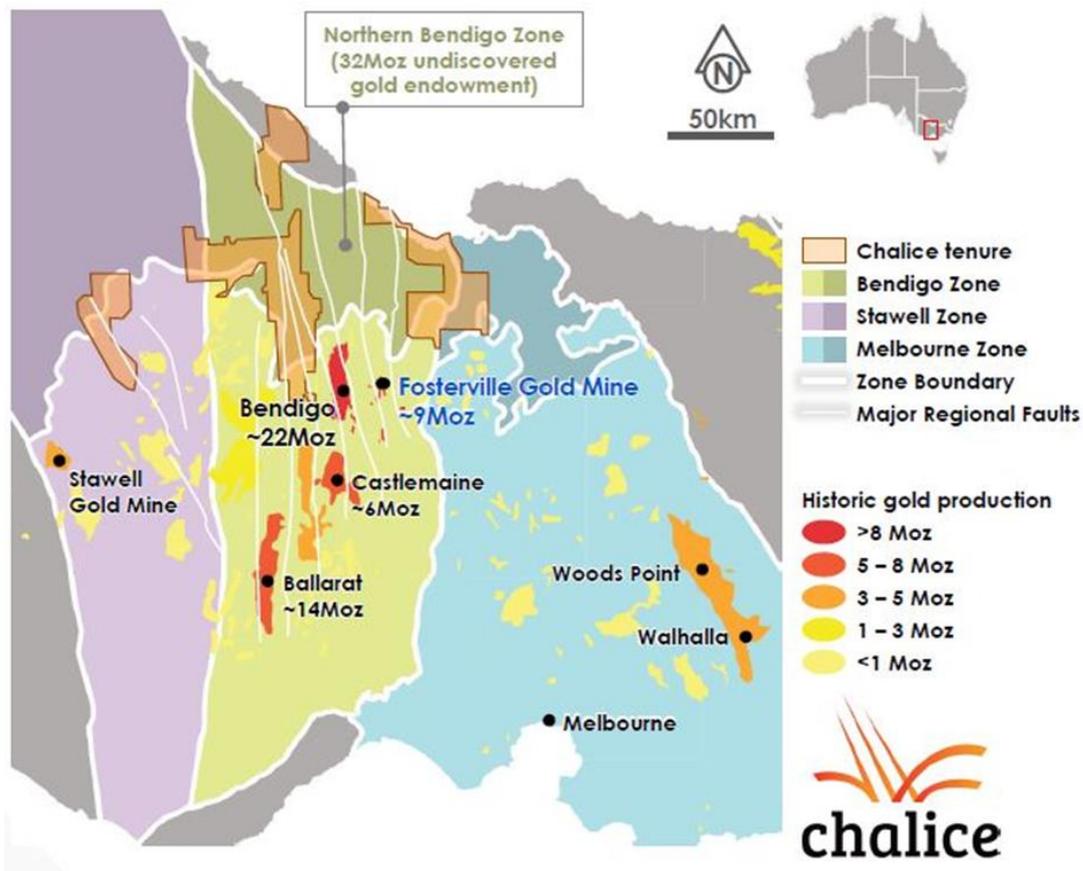


Fig 5: Chalice holdings under cover in N. Victoria [source: Chalice Gold Mines Ltd]

Chalice’s model of the mineralisation under cover in North Victoria is shown in Fig 6:

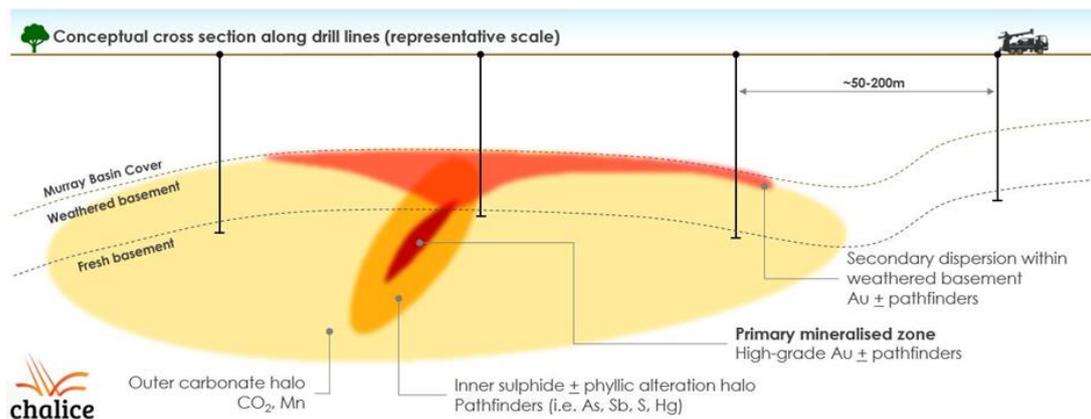


Fig 6: Conceptual model for sub-cover gold mineralisation, N. Victoria [source: Chalice Gold Mines Ltd]

*“Chalice commenced its regional scale greenfields exploration program in mid 2018. Due to the variable and in some cases poorly mapped cover depth and predicted economic constraints, Chalice’s initial focus is on areas with <150m of cover.*

*The company has adopted a systematic approach to undercover exploration, utilising the high quality regional geophysical, geological and geochemical datasets generated by the Victorian Geological Survey and previous explorers.*

Regional soil sampling, ground gravity geophysics as well as predicted structural corridors were initially used for targeting the first phase of reconnaissance drilling on widely spaced drill lines (3-7km apart). ~39,000m of reconnaissance AC drilling was completed over the 2018/2019 season, designed to provide reconnaissance-level shallow drill testing of targets defined from a combination of soil geochemistry, gravity and structural interpretation.

A ongoing ~25,000m Phase 2 reconnaissance air core (AC) drill program commenced in late Q3 2019 as a follow up to targets identified from Phase 1 drill testing.”

**The Majors Awake**

The majors noticed the increasingly good results at Fosterville, and they like ‘district plays’ and large tenement holdings. In 2017 Hancock Prospecting became a shareholder and a partner of Catalyst.

Newmont Goldcorp secured exploration ground in Victoria in January 2019.

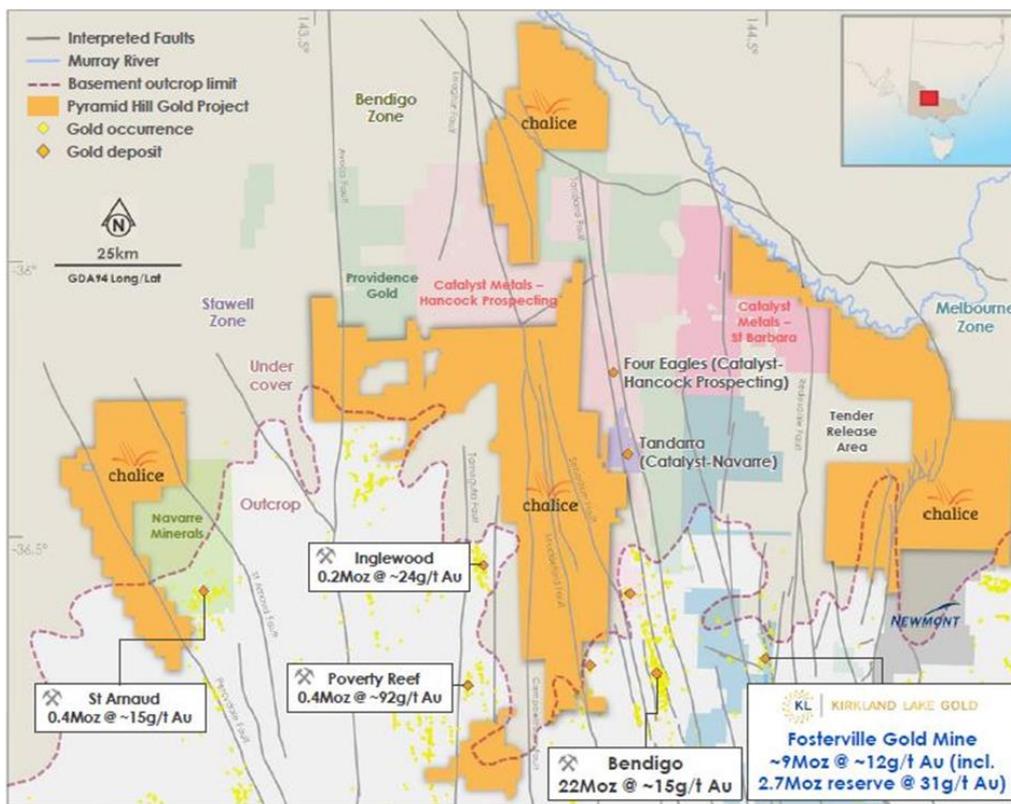


Fig 7: Overview of tenement position N of Bendigo and Fosterville [source: Chalice Gold Mines Ltd]

In November 2019 the Victoria Government announced the North Central Victorian Goldfields Ground Release, comprising 1,567 sq km in four blocks of ground previously unavailable for application and now offered by tender (see Fig 8 below). The position of these blocks, along the Redesdale Fault north of Fosterville, and comprising the highly prospective part of the Fraser Basin cover of North Victoria not pegged, is shown clearly in its geographic context as most of the ‘Exclusion Zone’ section of Fig 4.

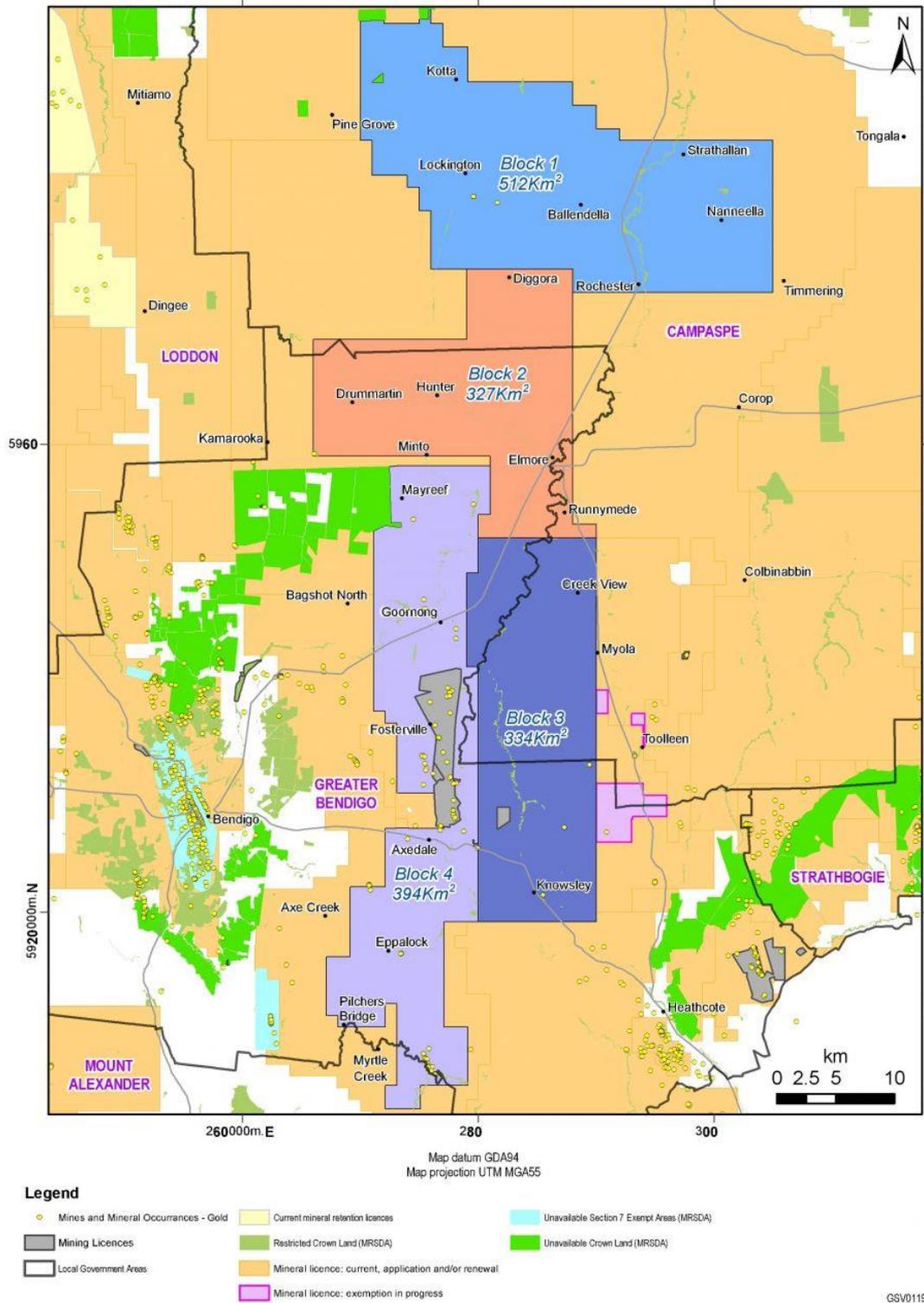


Fig 8: Tender areas under NCGVR, November 2019 [source: GSV]

The tender process closed in February 2020, and the assessment of applications, slowed by the impact of Covid-19, will lead to the announcement of successful tenders in or around August 2020. Some companies of moderate size have had to announce their applications with their March quarterly results to the ASX, including Navarre Minerals (see below), Catalyst, Chalice, and

**Kalamazoo Resources Ltd (ASX:KZR), 41.5c from 13c a year ago, market capitalisation A\$50m**, the holder of 310 sq km of the old Castlemaine Goldfield as well as other licenses.

However it is reported that a number of majors including companies from overseas have also tendered to gain a foothold in the Victoria Goldfields through a position in this prospective ground.

It is likely that the successful tenderers will, after offering the winning bid amounts and laying out their plans for exploration, move quickly into active exploration and drilling, while Chalice will continue to advance its Tandarra and Gold Eagle discoveries. Other companies will also be active.

North Victoria will therefore provide a source of increasing news flow over the next two or three years, with ripple effects on the value and prospects of other explorers of the Victoria Goldfields.

### Smaller Players

Kirkland Lake's Fosterville and Liongold's Ballarat remain the two producers in the region. Other companies are rapidly advancing exploration, including some smaller players. Kalamazoo has been mentioned above, while:

**Navarre Minerals (ASX:NML), 10.5c from 1.9c in 2016, A\$52m market capitalisation**, is a partner in Catalyst's Tandarra discovery in the northern extension of the Bendigo belt, and is active in the Stawell corridor to the west.

**ECR Minerals plc (AIM:ECR), 0.8p from 2.22p in March 2017, £4.4m market capitalisation**, owns the Creswick licenses north of and adjoining Liongold at Ballarat, where it reportedly sees potential for a target of 5m oz below and along strike from historic production.

*"The Creswick project is considered highly prospective for gold mineralisation hosted within the Dimocks Main Shale (the "DMS"), which extends over a 15km trend from the mining centre of Ballarat to the south, approximately 7km of which is covered by [ECR]'s granted exploration licence and exploration licence applications.*

*In the project area, the DMS is an approximately 25 m wide shale containing bedding- and cleavage-parallel auriferous quartz veins. The width of the shale and the occurrence of multiple veins in some zones indicates that potential open pit mining targets may present themselves as exploration progresses. Almost 1,500 shallow primary workings have been mapped in the belt from North Ballarat to Spring Hill (Creswick).*

*The DMS is the source of much alluvial and deep lead gold. Historical alluvial production is estimated at up to 2.5 million ounces in the Creswick/Berry lead system, and up to 11 million ounces in the Ballarat area as a whole, of which the DMS is a significant contributor.*

*[ECR] completed 1687m of reverse circulation (RC) drilling at Creswick in February 2019 for 17 holes. On 8 May 2019, ECR announced that the majority of the drill results had been received, with grades in nine holes ranging from 0.6 g/t gold to 44.63 g/t gold."*

**Nagambie Resources Ltd (ASX:NAG) , A\$0.51, capitalisation A\$26m**, has 2,000 sq km of licenses in Waranga in the Northern Melbourne Zone of eastern Victoria.

**Mawson Resources Ltd (TSX:MAW), C\$0.41, C\$82m capitalisation**, a Nordic explorer, in 2020 acquired a 10% holding in Nagambie, purchase or JV of two of its Victoria licenses and a right of first refusal over 3,600 sq km of Nagambie's claims in eastern Victoria.

### Everyone wants to be Fosterville

In April 2020, Fosterville South Exploration Ltd listed on the TSX. (TSX-V:FSX), price C\$1.58 after C\$1.08 at listing 14 April 2020, market capitalisation C\$71m. Current fundraise of C\$15m, raised from C\$10m due to demand.

Its main selling point was the fact that its Lauriston project licenses adjoined to the north the Kirkland Lake licenses containing Fosterville (not as stated here the Fosterville mine itself).



Fig 9: Fosterville South and Fosterville [source: Fosterville South Exploration Ltd]

#### *“Lauriston Gold Project*

*Fosterville South’s Lauriston Gold Project is a large land holding, within the same stratigraphic and structural setting as the Fosterville gold mine. The tenement has an extensive history of hard rock and alluvial gold production but limited modern exploration.*

*The Lauriston property is south of and adjoining Kirkland Lake’s Fosterville Gold Mine. The Fosterville Gold Mine reported a measured and indicated resource estimate of 14,800,000 tonnes at 4.4 g/t gold for 2,110,000 ounces of gold and an inferred resource estimate of 10,300,000 tonnes at 5.5 g/t gold for 1,830,000 ounces of gold. The project produced 619,366 ounces of gold in 2019.*

*Lauriston has a similar geological and structural setting and is on the same regional trend as the Fosterville Gold Project and occurs along the western margin of the Selwyn Block. Bendigo style saddle and trough reefs occur within the property as well as subvertical shear zone style gold and quartz vein mineralization which occasionally have epizonal characteristics.*

*The Fosterville South property has metallogenic indications of Fosterville style epizonal gold deposits, but has not been explored for these types of deposits, particularly as they were not recognized as to their significance until recently.*

*Gold mineralization is hosted by Ordovician slates and sandstones in association with felsic dykes, either with quartz veins or with disseminated arsenopyrite – pyrite ± stibnite.”*

Apart from referencing Fosterville, Fosterville South also emphasises the Whitelaw fault and the connection to Catalyst discoveries:

*“Lauriston tenement contains the south extension of the Whitelaw Fault & Gold Belt which is a key feature of the Bendigo Goldfield, while Catalyst Metals are exploring the 75km northern extension of this structure with significant success”.*

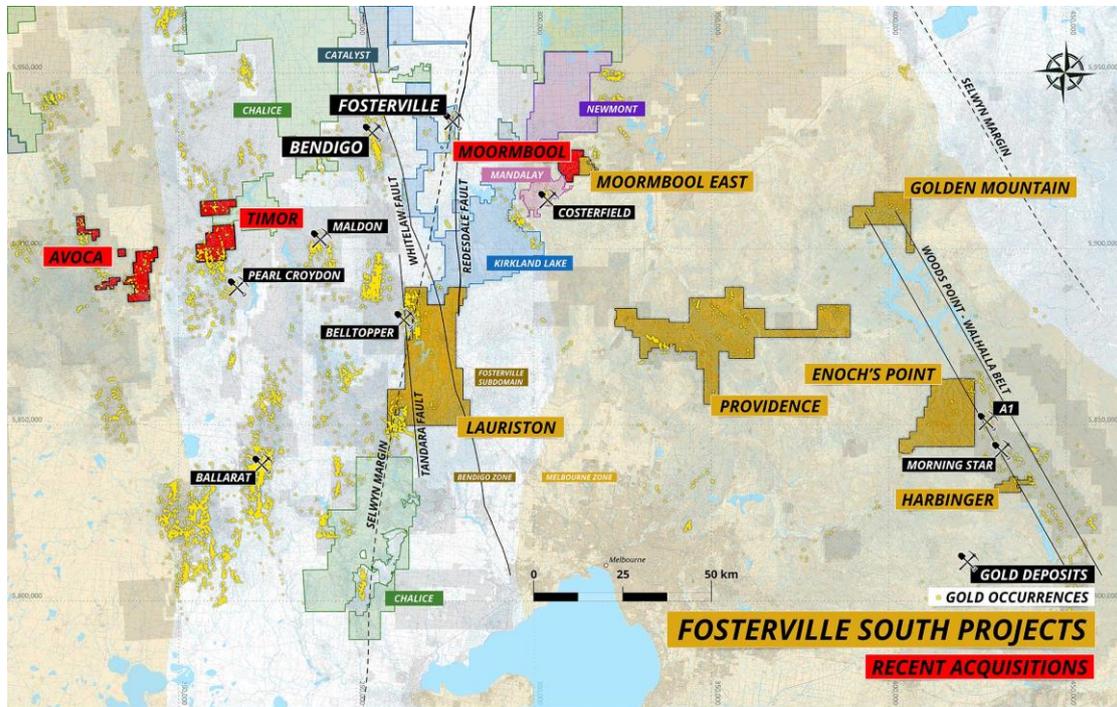


Fig 10: Fosterville South Projects, showing Lauriston proximity to KLG [source: Fosterville South Exploration Ltd]

The land package including the three licenses bought from ECR amounts to 1,657 sq km, of which Lauriston is 600 sq km.

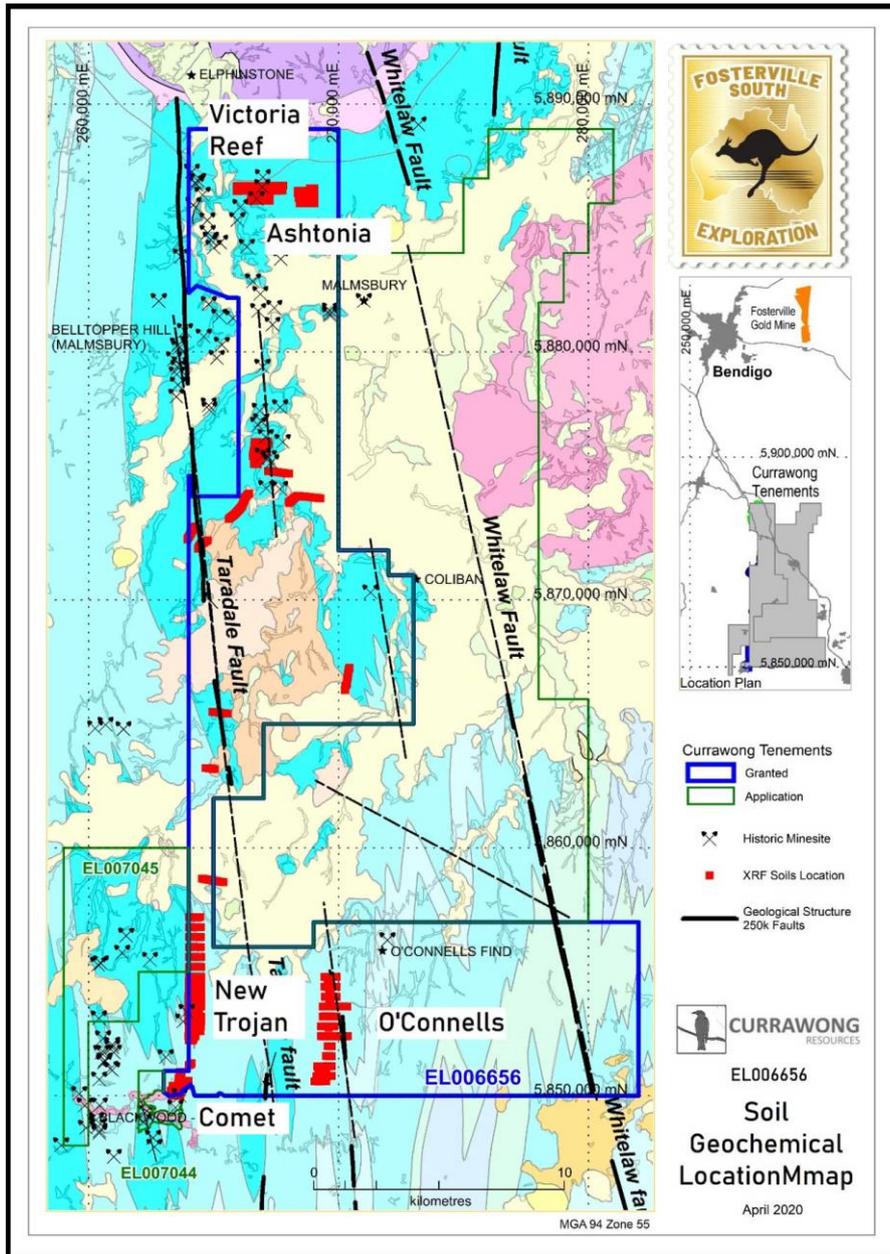


Fig 11: Lauriston project showing recent work near W boundary [source: Fosterville South Exploration Ltd]

The original license here was EL006656 which takes in the old workings (note the use of crossed pick images, much more effective visually than mere dots) in the area. Before IPO the company applied for adjacent ground containing the Whitelaw fault, which perhaps helps sell the story and also bulks up the acreage.

Available ground for pegging adjoins the West side of EL006656.

Fosterville South also hypothesises an importance in the relationship to the Selwyn Block boundaries, though we may note that Ballarat and other mineralisation lies outside this Block.

*“The deep seated Selwyn Block underlies the epizonal Au-As-Sb mineralization domain. Proximity to the margins or larger structures within the Selwyn Block is considered important for all major deposits within the epizonal domain”*

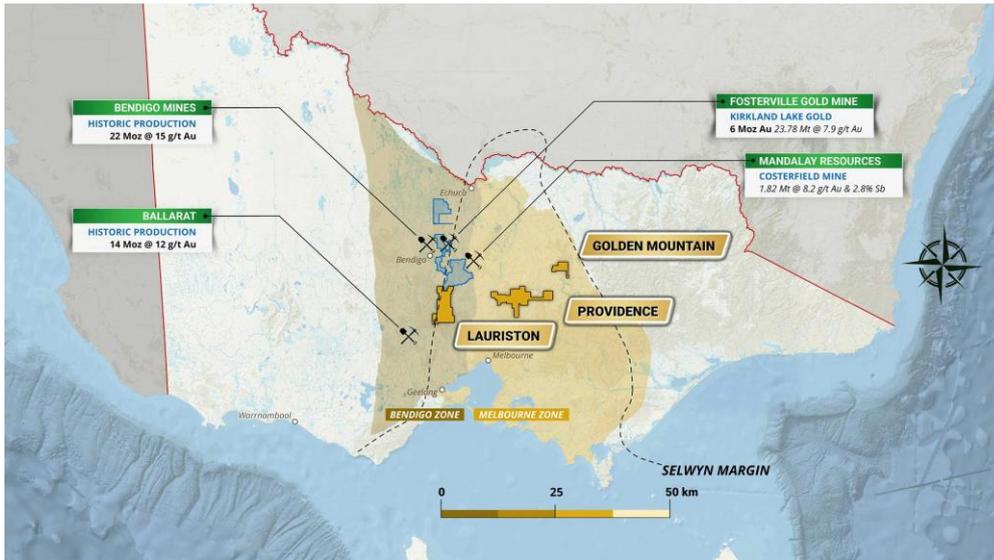


Fig 12: Selwyn Block [source: Fosterville South Exploration Ltd]

**Buzz words**

Whitelaw Fault or fault corridor, Fosterville, epizonal, Selwyn Block.

The major gold deposits are controlled by regional scale faults, which continue to the north into Chalice's tenure → **follow the strike**

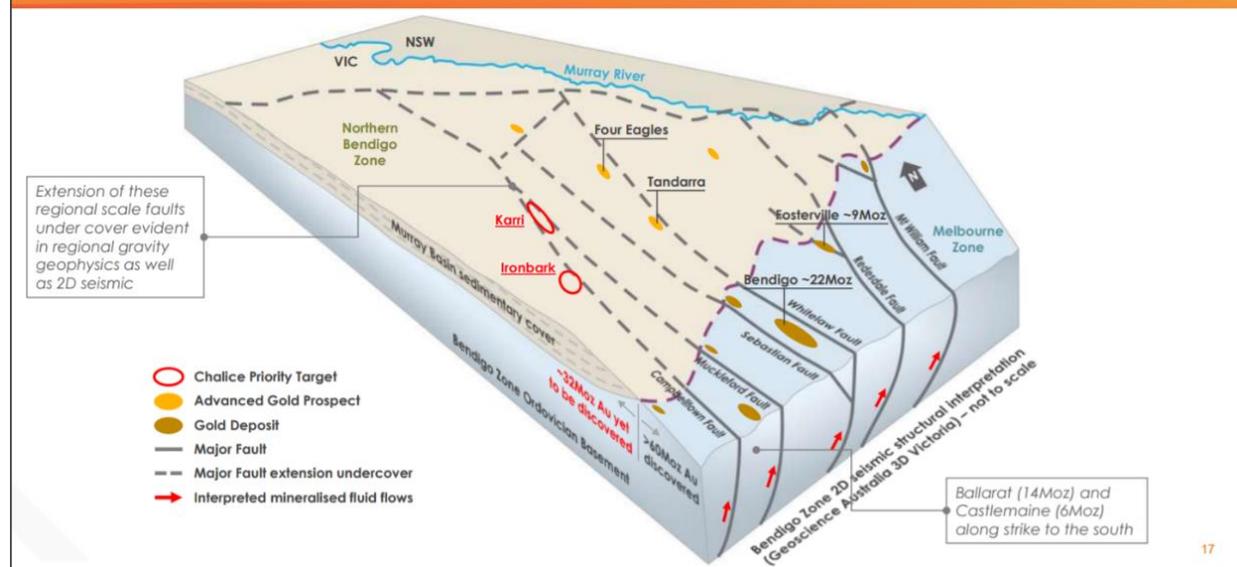


Fig 13: Mine Relationship to Regional Faults, eg Whitelaw (Bendigo), Redesdale (Fosterville)[source: Catalyst Metals Ltd]

It may be noted that other faults may have importance, eg with Fosterville, but because of the Chalice discoveries the talk is of the Whitelaw fault.

## Conclusions

The necessity in the areas under cover of considering structural pointers to mineralisation, and the developments at Fosterville, have led to a new way of thinking about the gold potential in the Victoria Goldfields. There is an awareness of the possibilities for further mineralisation, and even higher grade mineralisation, in some areas at depth.

There has been no significant exploration for a century, and the ground is largely undrilled to any depth in an area of complex geology. Thinking may therefore still be dominated by a very small number of models or templates generalised heavily from one or two discoveries.

Attention has been largely on the North, and in particular the extensions under cover of the faults related to the Bendigo mines and Fosterville discovery.

The State Government's desire to stimulate exploration and counter the former perception of Victoria as a low-ranked investment destination for the mining industry (see Fraser Institute surveys) has led to heavy promotion of the virgin exploration ground under cover in the north of the State. This has led to the pegging and exploration activity of companies such as Catalyst and Chalice, bringing new investment and employment, and following the Catalyst discoveries, the North Central Victorian Goldfields Ground Release has been timed to catch the wave of interest and higher gold prices, and will bring tender money directly into the State coffers.

The presentation day to launch the North Central Victorian Goldfields Ground Release saw some extremely high quality presentations, and Ross Cayley of the GSV's presentation is of particular interest and should be viewed by anyone contemplating entry to Victorian Goldfield exploration:

<https://www.youtube.com/watch?v=jxNE8WPU-BQ>

The passage from 6.03 minutes, and the statement at 6.24 minutes that **"the brownfields can contain blind worldclass deposits"** should be noted, as should be the passage from 31.15 minutes, repeating the same points.

The drilling of blind or deeper targets is not something only for the north and under cover, but applicable to the brownfields deposits of Victoria which are essentially unexplored at any depth.

<https://www.youtube.com/watch?v=zmnzBC3Szw> is also of interest.

The State Government states that **"Most of the undiscovered gold in Victoria is likely to lie at greater depths than has previously been explored.** The Geological Survey of Victoria estimates that there may be up to 75 million ounces of gold yet to find in the central and north central Victorian goldfields. This compares with the 80 million ounces of gold mined from the area over the past 160 years."

The marketing emphasis has been on the north, and the Bendigo and Fosterville models and their applicability there. But with the likely metamorphic source rock everywhere present, there will be other occurrences, generating other models, to come. The region is generally prospective.

Investor interest is greatest if the current buzz words eg Fosterville, Bendigo trend, Whitelaw Fault, epizonal or orogenic gold, are used. The Fosterville model, more readily applied to Bendigo than the other historic mining centre of Ballarat, is the "new paradigm".

In the traditional mining areas, certainly until recently, the "old paradigm", of looking for gold around and a little deeper than the old occurrences and production, still existed, rather than the new deeper structural and seismic analysis-driven approach.

Fosterville however began with an old mine, so the approaches are not necessarily contradictory. In the area RRAL has pegged hardly any workings show as deeper than +/-30m. If one took the conceptual long section of Fosterville in Fig 1, and imagined a line 30m below surface, there would be little there of interest, and no clue to what lurked beneath. When RRAL looked at a 2003 report on the area of the White Horse fault east of Daylesford and just outside RRAL's license area (now sadly in a National Park), the writer compared that short fault with lowish grade open pittable near surface grades with small areas of high grade with Fosterville: the expansion of production at which began two years later. Fosterville was well enough known to be a comparator, but not yet well understood.

One may question whether, if drilled from surface, the highest grade Swan zone at 1200-1400m would easily have been found.

There are only two mines in operation in the Bendigo zone of the Goldfields. Fosterville, and RRAL's neighbour Ballarat mine. As exploration continues, different styles and models will appear. The fact that the focus has not primarily been on the Ballarat area recently is what has given RRAL its chance of entry.

#### [The RRAL licenses.](#)

RRAL currently holds the following ten license applications:

EL007271 - Blue Whale - 133 sq km

EL007285 - Blue Ribbon - 8 sq km

EL007281 - Blue Chip - 74 sq km

EL007282 - Blue Sky - 489 sq km

EL007301 - Mt Bute - 85 sq km

EL007294 – Red Queen - 130 sq km

EL007327 – Blue Stocking – 60 sq km

EL007328 – Blue Moon – 168 sq km

EL007329 – Evergreen – 486 sq km

EL007330 – Blue Angel – 202 sq km

Seven of these are contiguous, and the aggregate area of all ten is 1835 sq km.

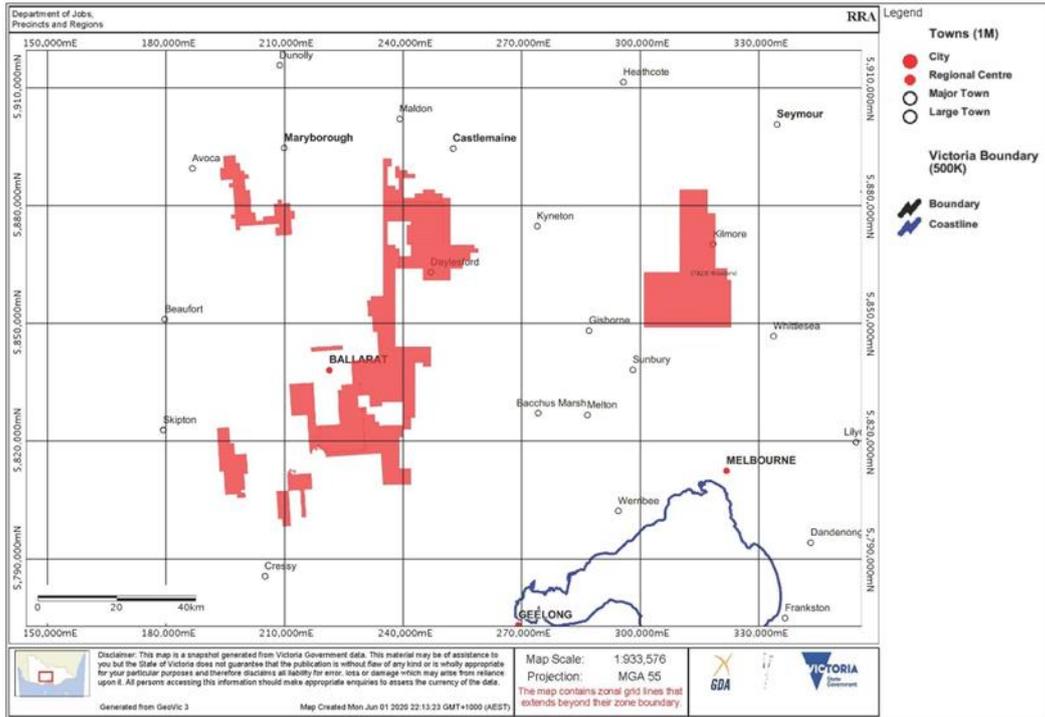


Fig 14: Sketch map of RRAL licenses on cadastre

The ground adjoins both the Ballarat and the Creswick mining areas. It contains numerous old mines and workings, including some recorded as deep towards the East and in the North. The smallest at EL007285 contains almost drill-ready prospects identified by a previous holder but never drilled. EL007271 contains apparent extensions of gold mineralised trends at Ballarat and Cresvale.

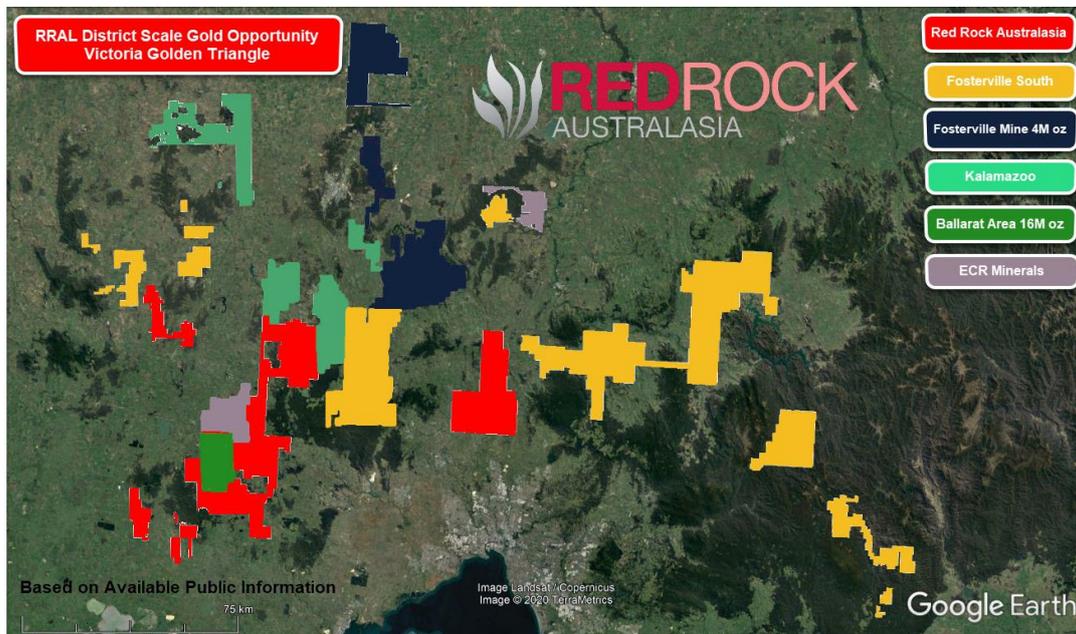


Fig 15: RRAL Applications in context of other major license positions

**Next steps**

- continued study of regional co-operation opportunities

- further study of exploration history of RRAL tenements
- consideration of structural and geophysical aspects in light of latest exploration
- analysis of satellite imagery
- initial community engagement
- communication to investment public of information about license potential and exploration objectives.

AB 09.06.20