

Assessment of Primary Gold and Base
Metal Potential on
Tasmania Advanced Minerals
Tenements
EL20/2016, 25M/2003
and their immediate vicinity
Western Tasmania

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INTRODUCTION

- Hugh Nolan Director of Tasmanian Advanced Minerals (TAM) commissioned Professor Ross Large to assess the data from previous exploration in and around the Silica Flour mineral leases held by TAM in the Corinna Gold Field, Western Tasmania
- Previous exploration for gold has been carried out by;
 - Cominex/TAM
 - EZ Exploration and Norgold 1987-88
 - Aberfoyle Exploration 1989-90
 - Goldstream 1997-98
- The Corinna Gold Field was intensively worked for alluvial gold in the period 1880's and early 1900, however few hard rock gold occurrences were defined
- This study involved inspection of reports and maps by previous explorers with additional data from the Mineral Resources Tasmania website

!:250,000 GEOLOGY

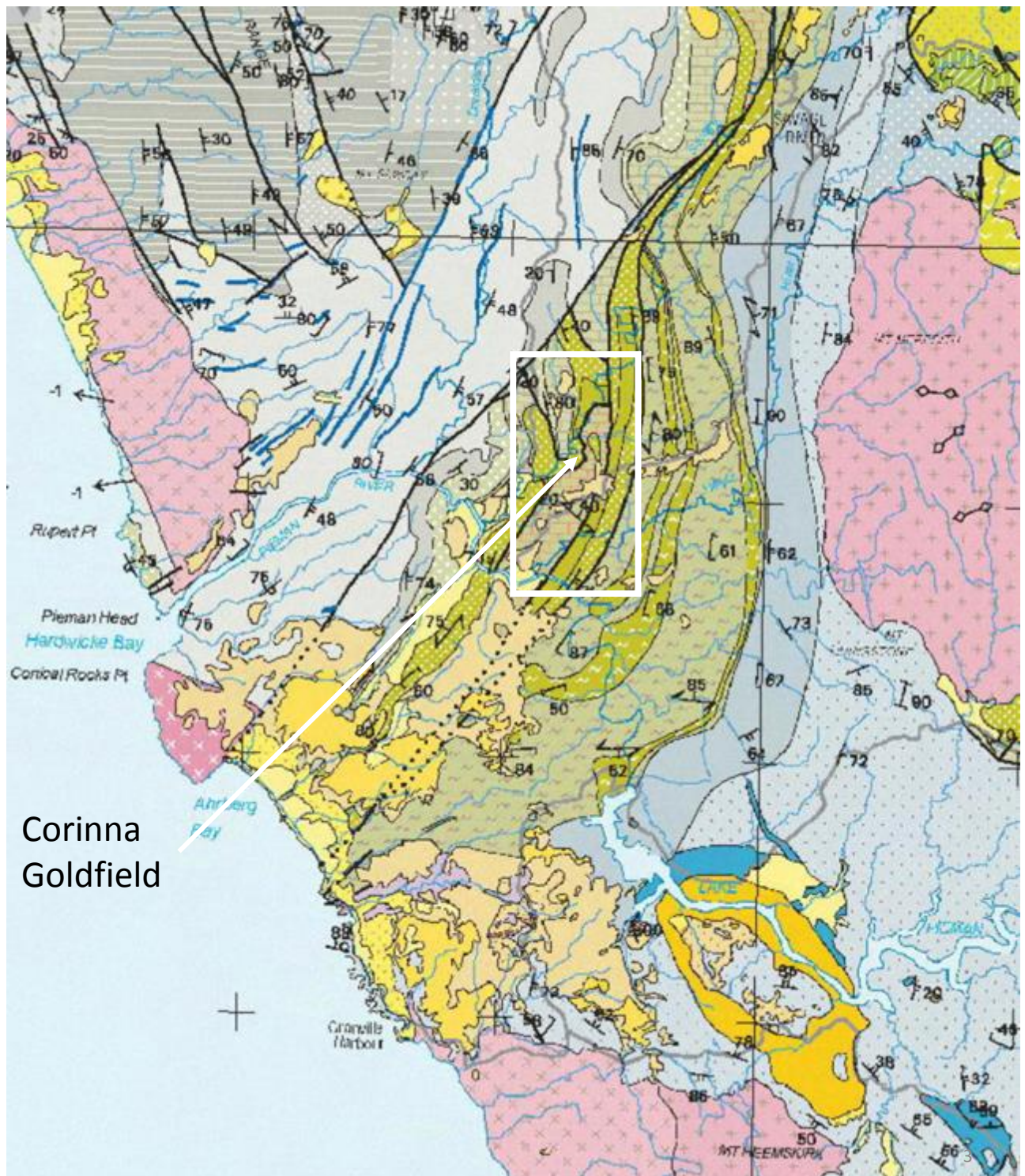


Fig 1.

Locality
Geology Map
(Calver et al., 2014)

Corinna Goldfield

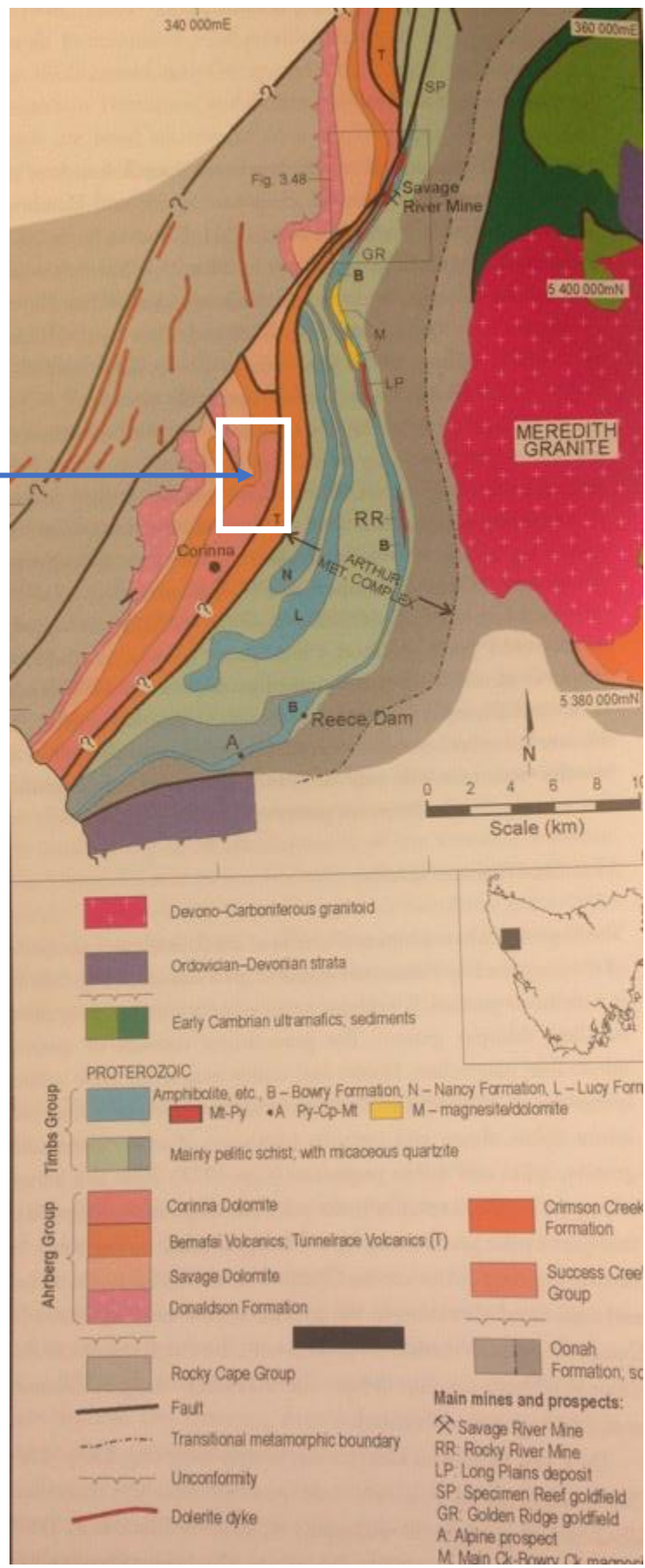


Fig. 2

TAM Mineral Licences

Eastside anomalies

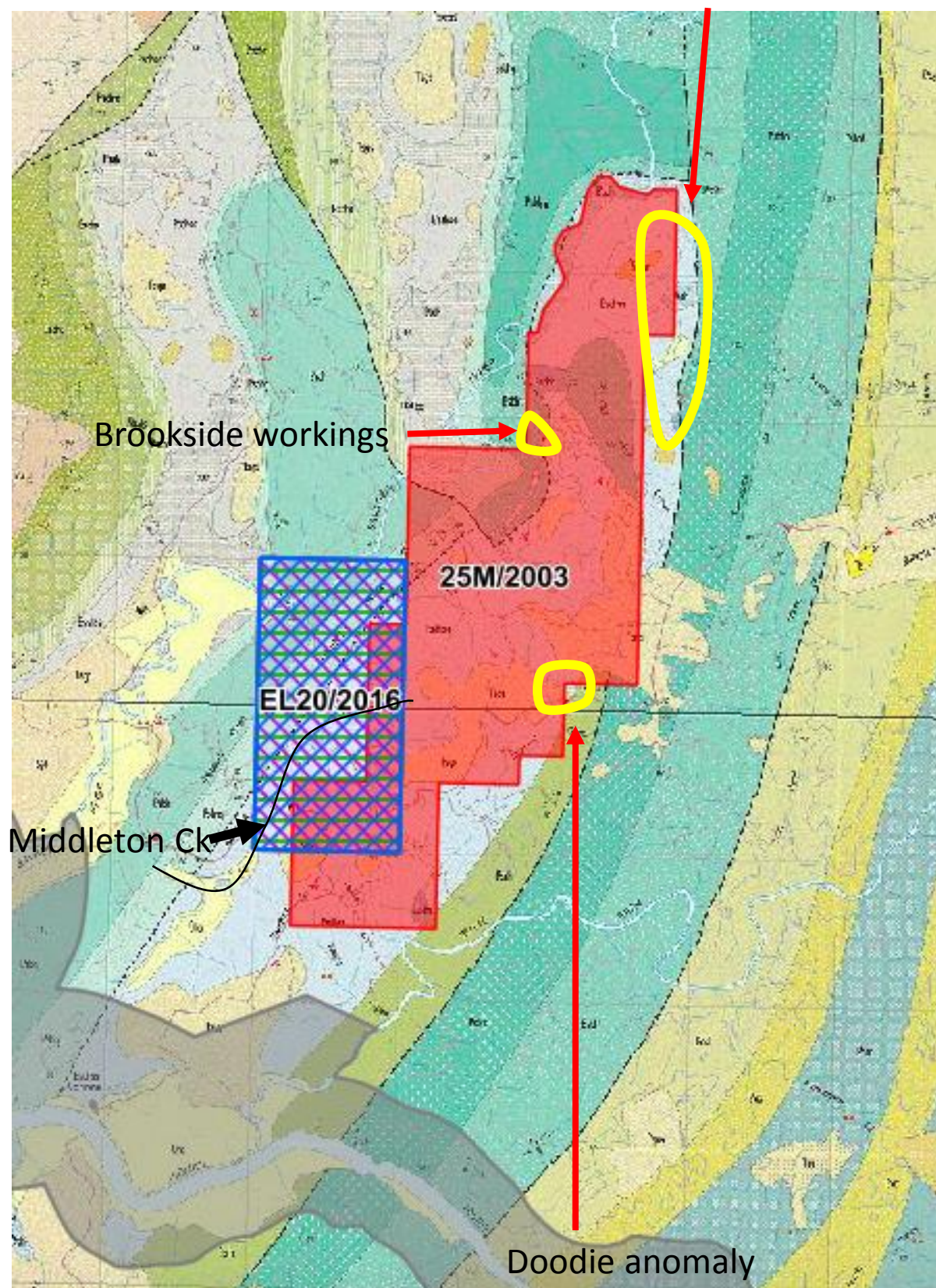


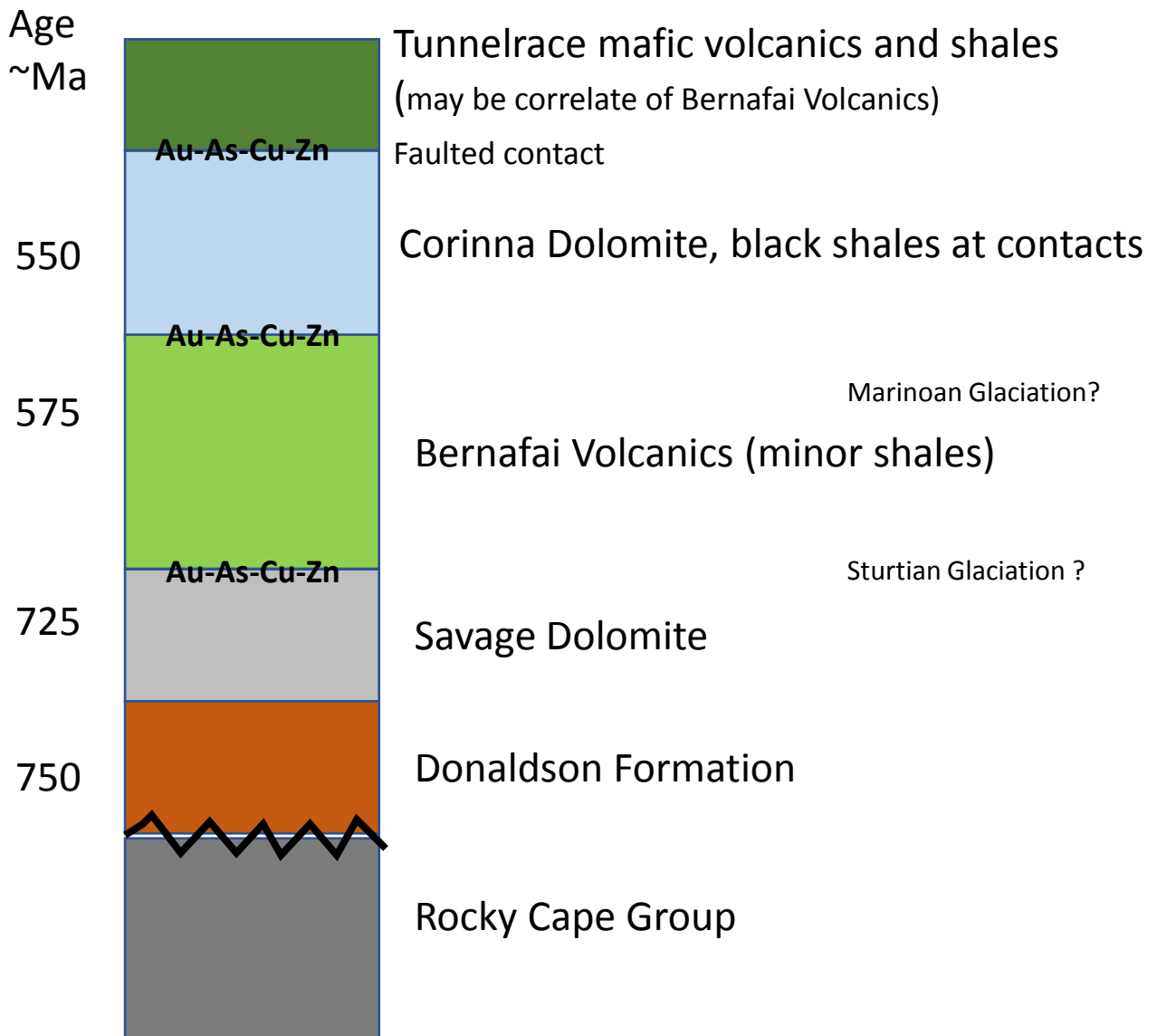
Fig. 3

Defined Prospects by MRT



Fig. 4

Stratigraphic Column



Gold mineralisation is commonly along contacts of carbonates with volcanics and shales

Fig. 5

GEOLOGY

- The Corinna Dolomite covers most of the lease area, with patchy overlying Tertiary gravels (Fig. 2)
- The Dolomite is folded in a broad syncline with Bernafai Volcanics to the west and Tunnelrace Volcanics to the east
- Prospects defined by MRT are shown Fig. 4
- The major rock units and their stratigraphic relationships are shown in Fig. 5
- The Corinna Dolomite is extensively silicified with brecciated and weakly pyritic facies towards its margins
- The Benafai Volcanics and Tunnelrace Volcanics are schistose and have a similar lithology and composition. They may be stratigraphic correlates.

Major Structures

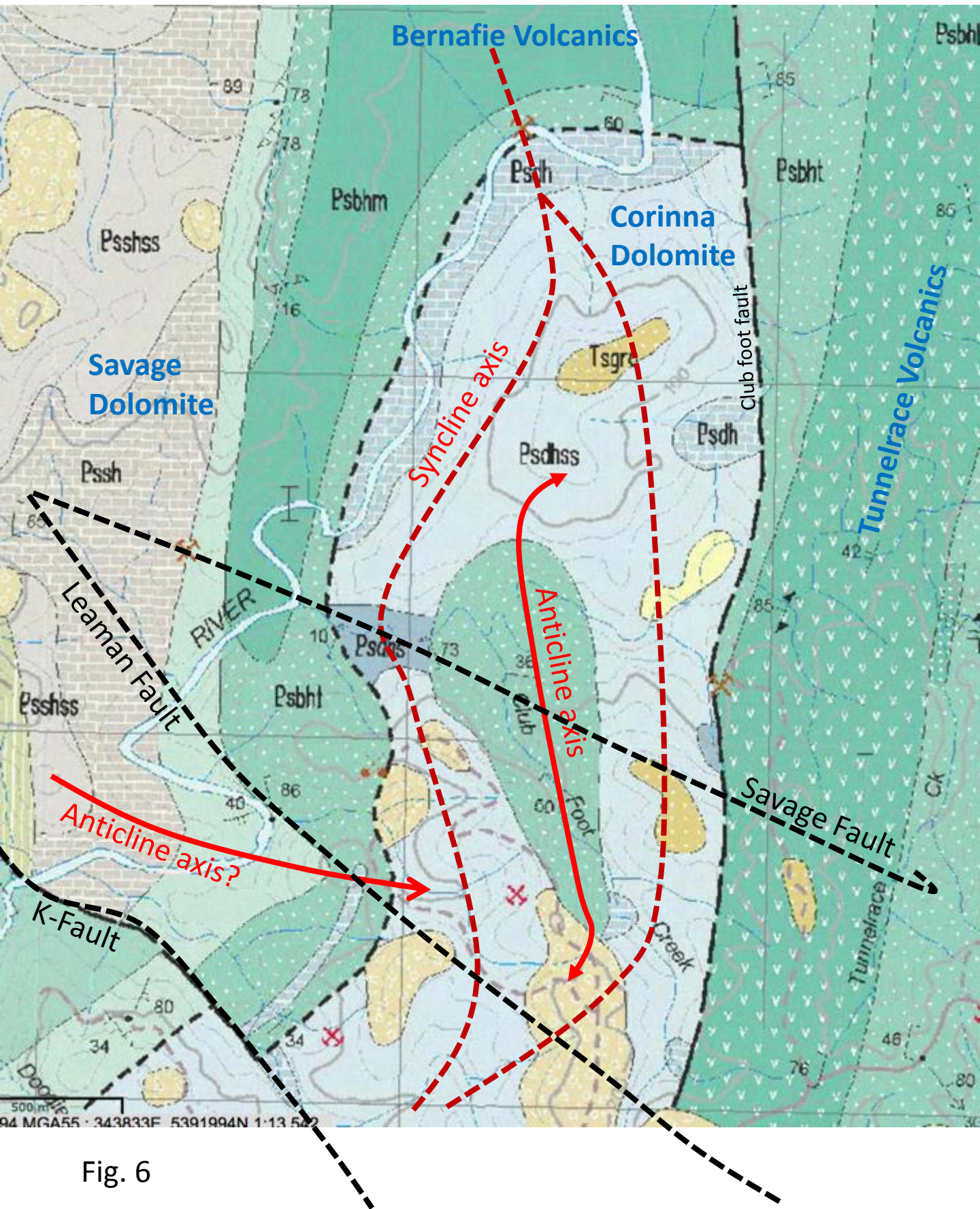


Fig. 6

AEROMAGNETICS

Longback 1

Possible Faults

Club Foot Fault

Magnetics defines locations of possible major faults

Fig. 7

STRUCTURE

- The Corinna Dolomite forms a N-S synclinal boat structure with a minor oval shaped anticlinal core of Bernafai Volcanics (Fig. 6)
- The contact between the Corinna Dolomite and underlying Bernafai Volcanics on the west side of the syncline appears to be stratigraphic, although locally faulted as is the case in the Brookside workings
- The contact between the Corinna Dolomite and Tunnelrace Volcanics on the east side is marked on maps as a regional N-S fault. Here called the Club Foot Fault
- The Norgold Eastside anomalies are adjacent to this N-S fault and partly lie outside ML 25M/2003
- Three NW trending faults, that cut across the southern part of the syncline have been interpreted from the MRT aeromagnetic data (Fig. 7). These are named the Savage Fault, Leaman Fault and K-Fault (Fig. 6).
- These NW faults may have an important control on hard-rock gold mineralization.

Alternative Fold Geometry

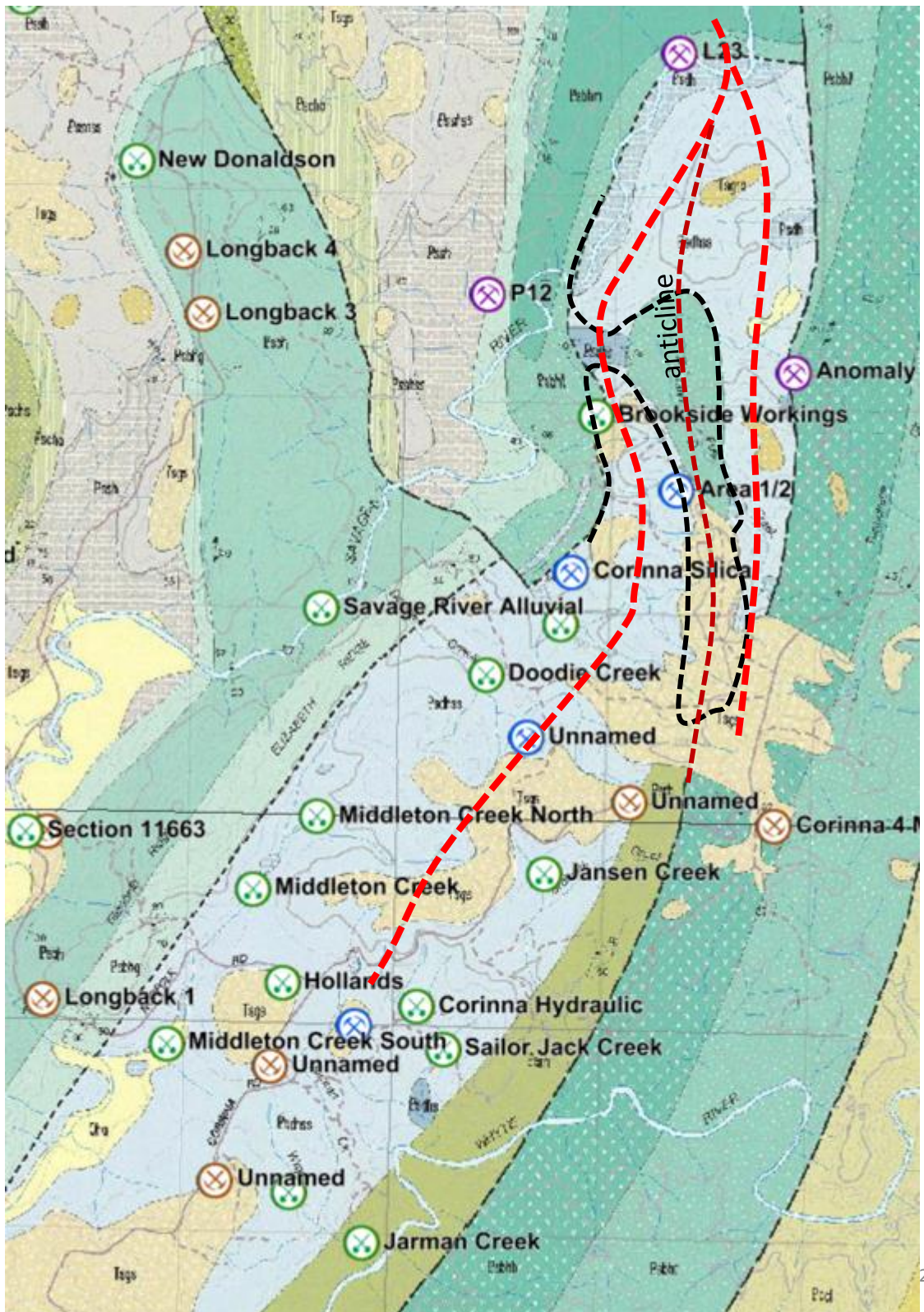


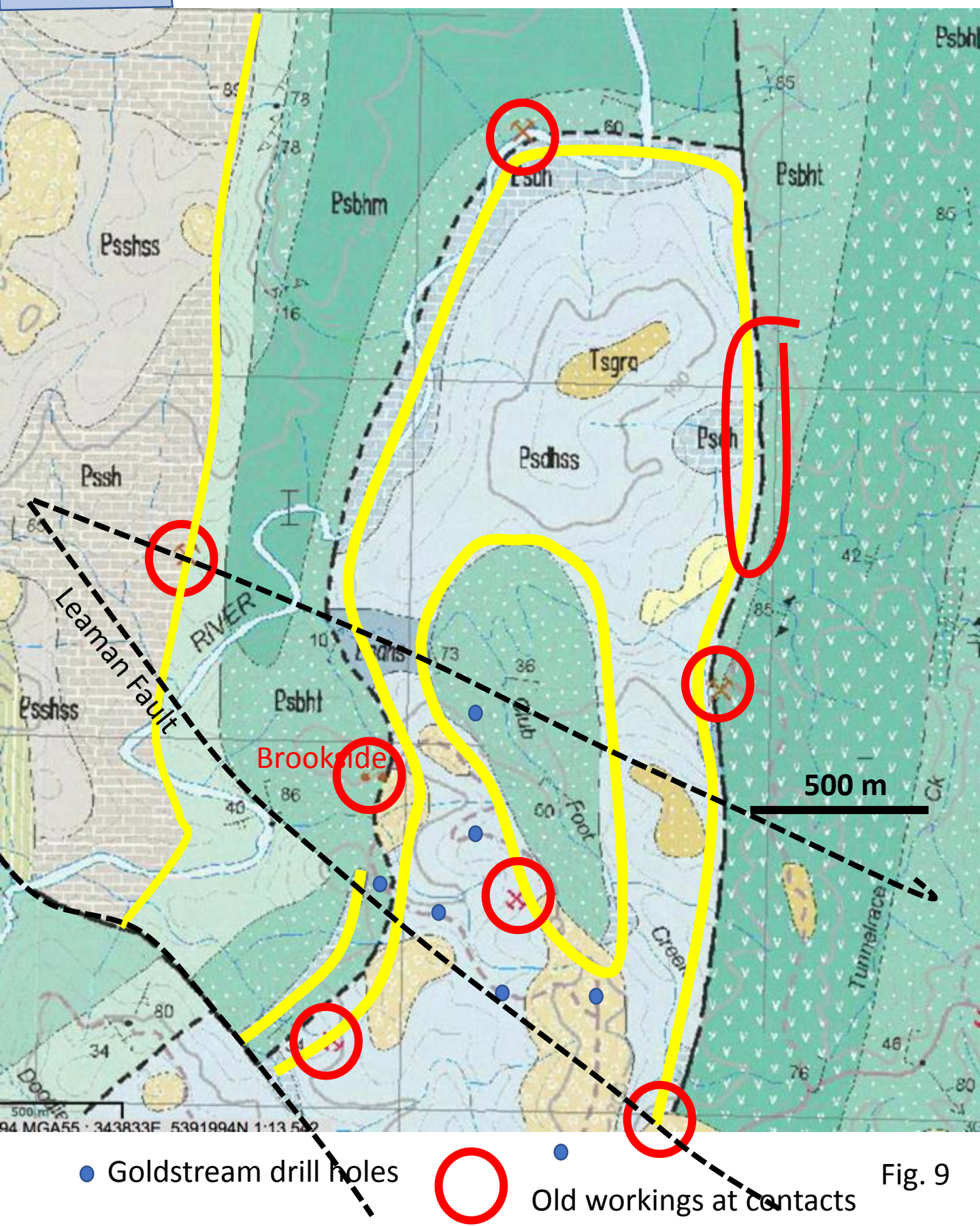
Fig 8

Gold Prospects

- Nearly all the hardrock mineral prospects marked on the MRT 1:25,000 map (Fig. 4) are located on, or close to, the contact between the Dolomite and Volcanics. This contact is marked by carbonaceous and pyritic shales in some cases, such as Brookside.
- The main gold alluvials at Brookside are also adjacent to this contact on the western side of the Corinna Dolomite
- Other gold bearing alluvials are present on the western side of the Corinna Dolomite (e.g. Middleton Creek, Fig. 3)
- The drilling by Aberfoyle and Goldstream confirm that weak gold-arsenic-base metal mineralization occurs either in the silicified dolomite or in the volcanics (or shales) adjacent to the dolomite-volcanic contact
- This combined data strongly suggests that all dolomite-volcanic contacts in the area of the Gold Field are likely to be mineralized to some degree (see yellow lines on Fig. 9)
- Thus, if any major gold deposit is present in the district it is highly likely to be on, or close to, a dolomite-volcanic contact.
- This feature enables future exploration to be focused along known contacts



Potential Gold zones at Contacts



The Third Dimension – Cross Section Line

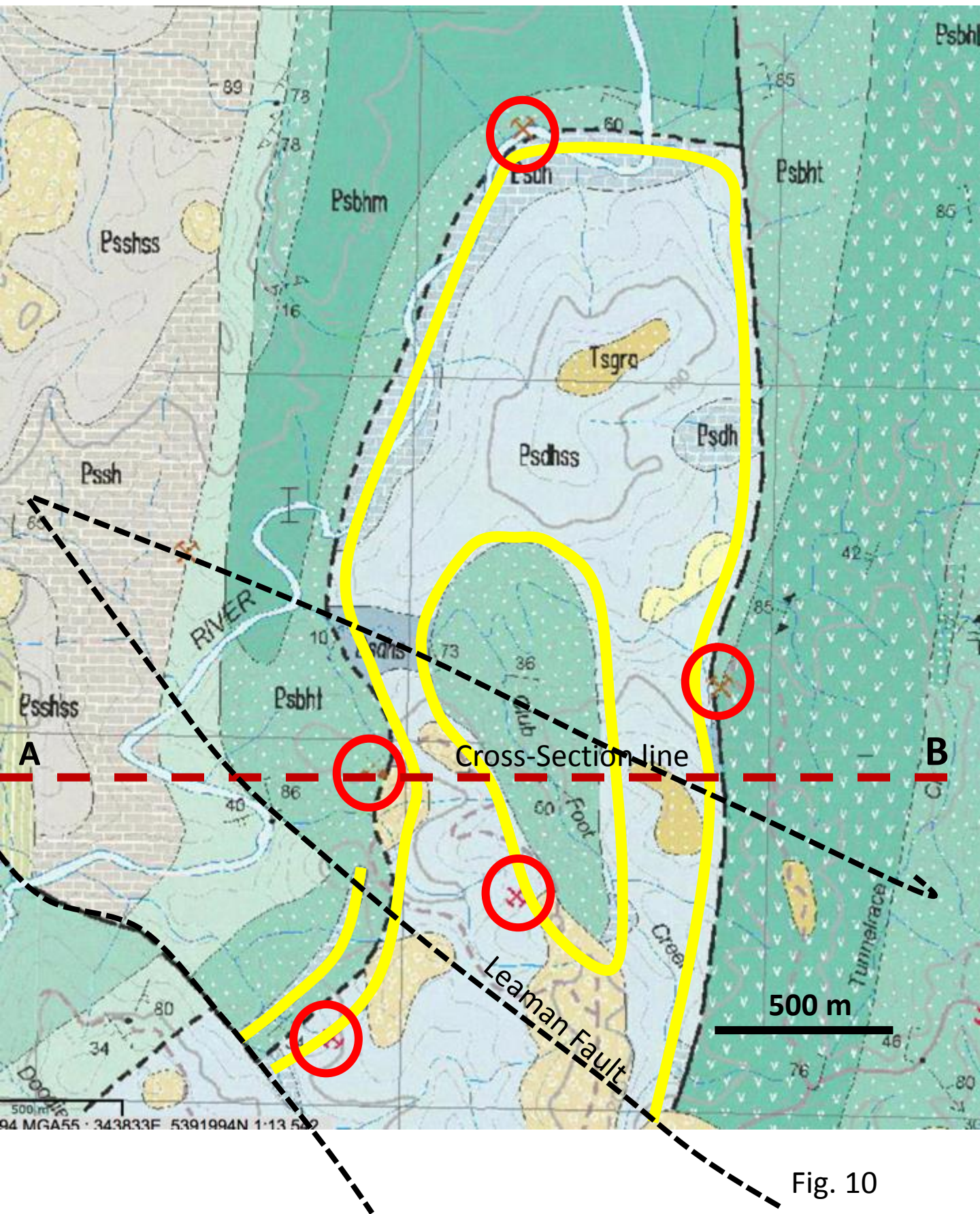


Fig. 10



Potential Gold zones at Contacts

Geology Cross-Section A-B

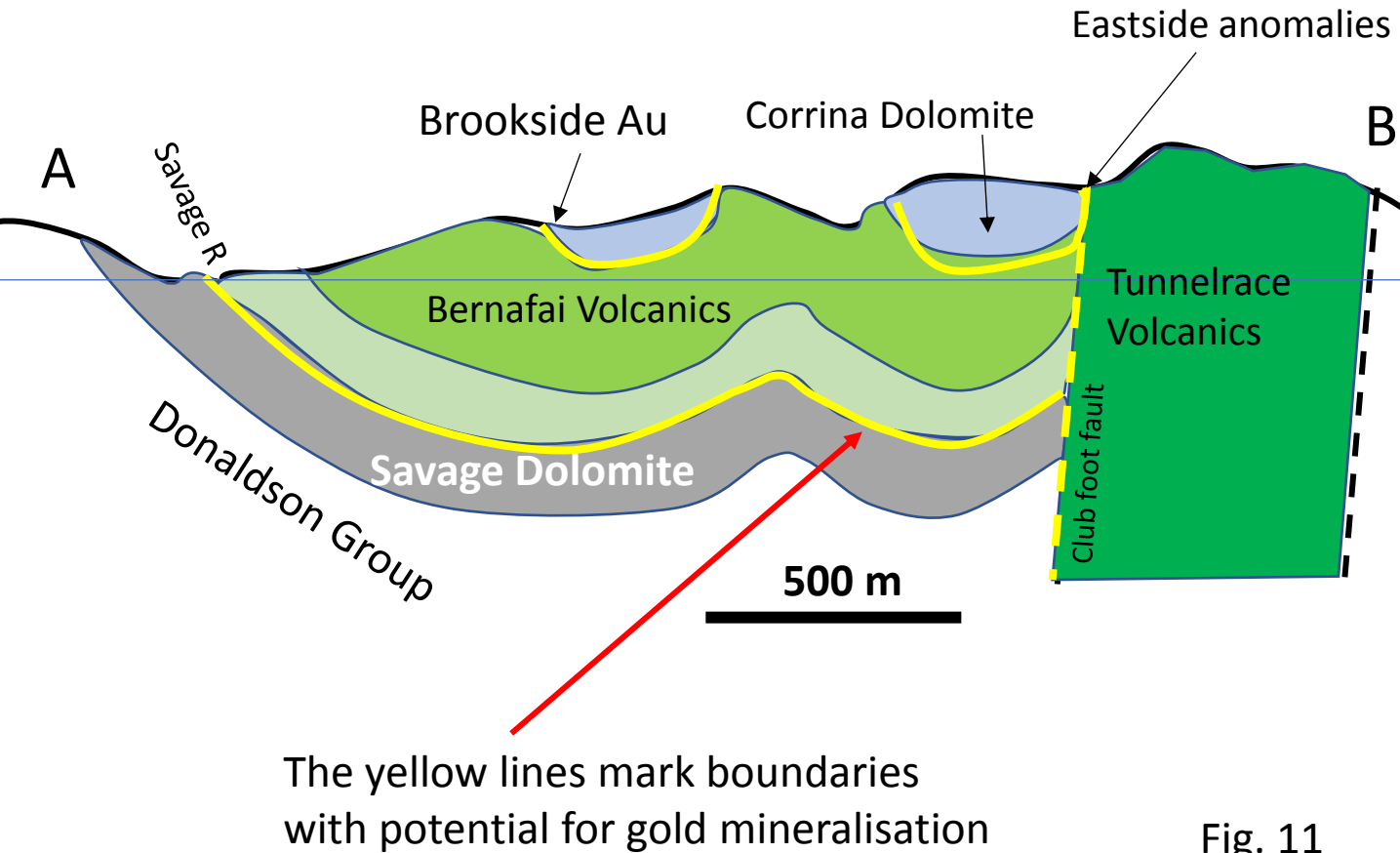


Fig. 11

Cominex Exploration

- Cominex main focus has been on defining the areas of silica flour potential
- This has led to a successful high purity silica flour mining and processing operation supplying high quality silica for the global market
- In addition to this activity, Hugh Nolan the principal of Cominex, has studied the nature and transport distance of alluvial gold grains on the leases
- This work has found gold grains indicative of both long and medium transport from areas to the east of the leases, and also crystalline gold indicative of a short transport distance within the leases.
- The key question is “What is the source of the crystalline Gold”, and does it represent a minable hard rock resource on the mineral leases?
- The main focus for Cominex was the source of crystalline gold in and around the Brookside alluvial gold workings.

EZ-Norgold Exploration 1987-1989

- Followed up Input EM anomalies in EL 37/82 previously defined by Esso.
- Anomalies 16, 17, 18 and 19 found to be associated with pyritic black shales
- EM6 also has black shales in outcrop
- One siliceous ironstone sample near EM6 gave 1.4 ppm Au
- The area of EM6 was gridded and mapped (Eastside Grid)
- A N-S zone of dolomite 100-200m wide is flanked on both sides by volcanoclastic shales on the Eastside grid (Fig. 8).
- No coherent Au anomalies in soils on grid.
- An area of roughly 400x100m with Fe stained chloritic schistose sediments corresponds to the position of the EM6 anomaly (Fig. 13)
- This zone is coincident with an 800X100m arsenic soil anomaly of >10 ppm As that lies on the shale side of the dolomite-shale contact (Fig. 13)
- A second As soil anomaly is located 100-200m further west (Fig. 13, 14). This anomaly straddles the Eastern boundary of the TAM mineral license.
- A spot high 55 ppb Au in soil corresponds with the peak of the western As anomaly
- There appears to be no follow-up of these As anomalies or the EM anomaly by Norgold



Norgold – Eastside Grid Geology

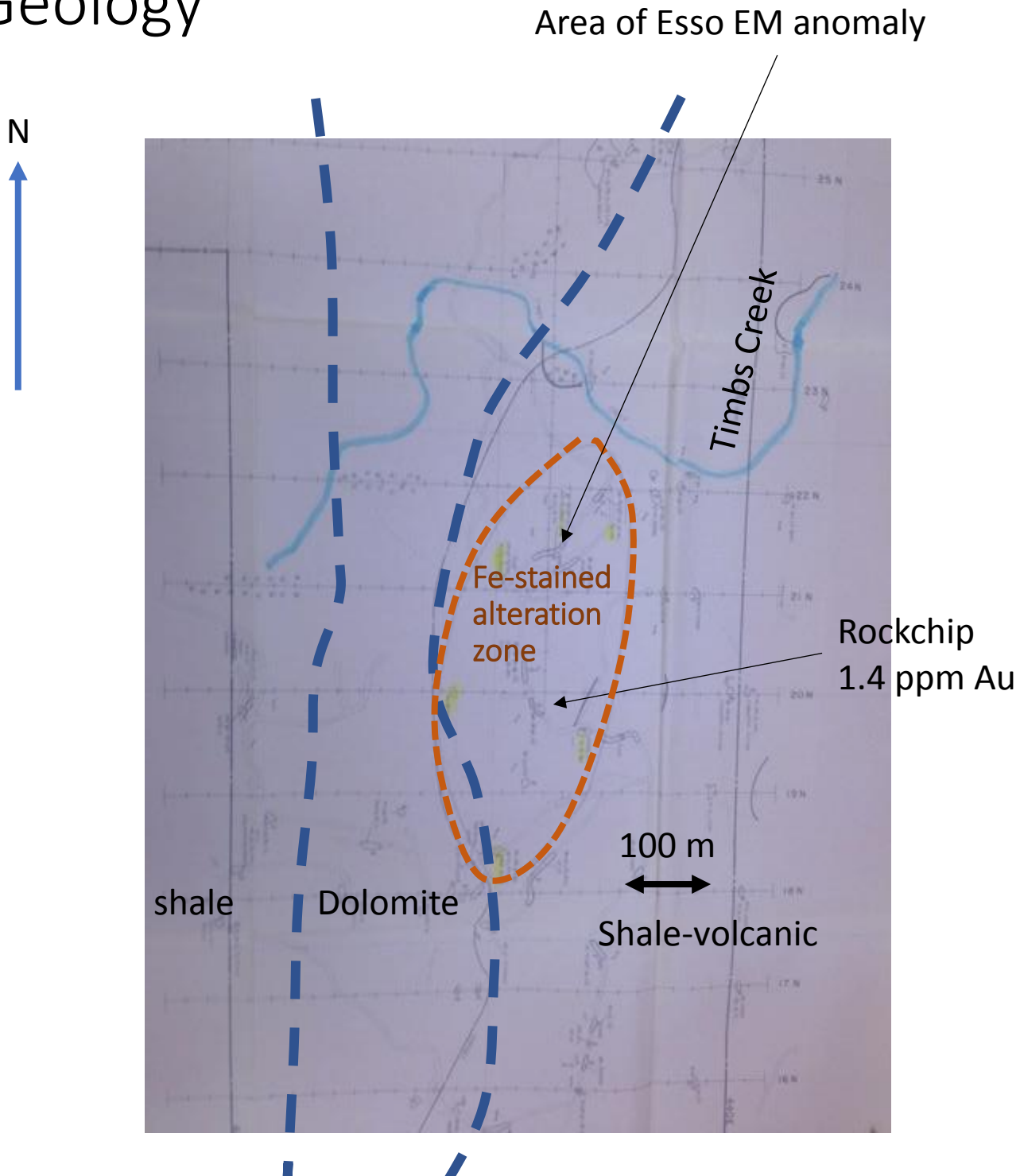
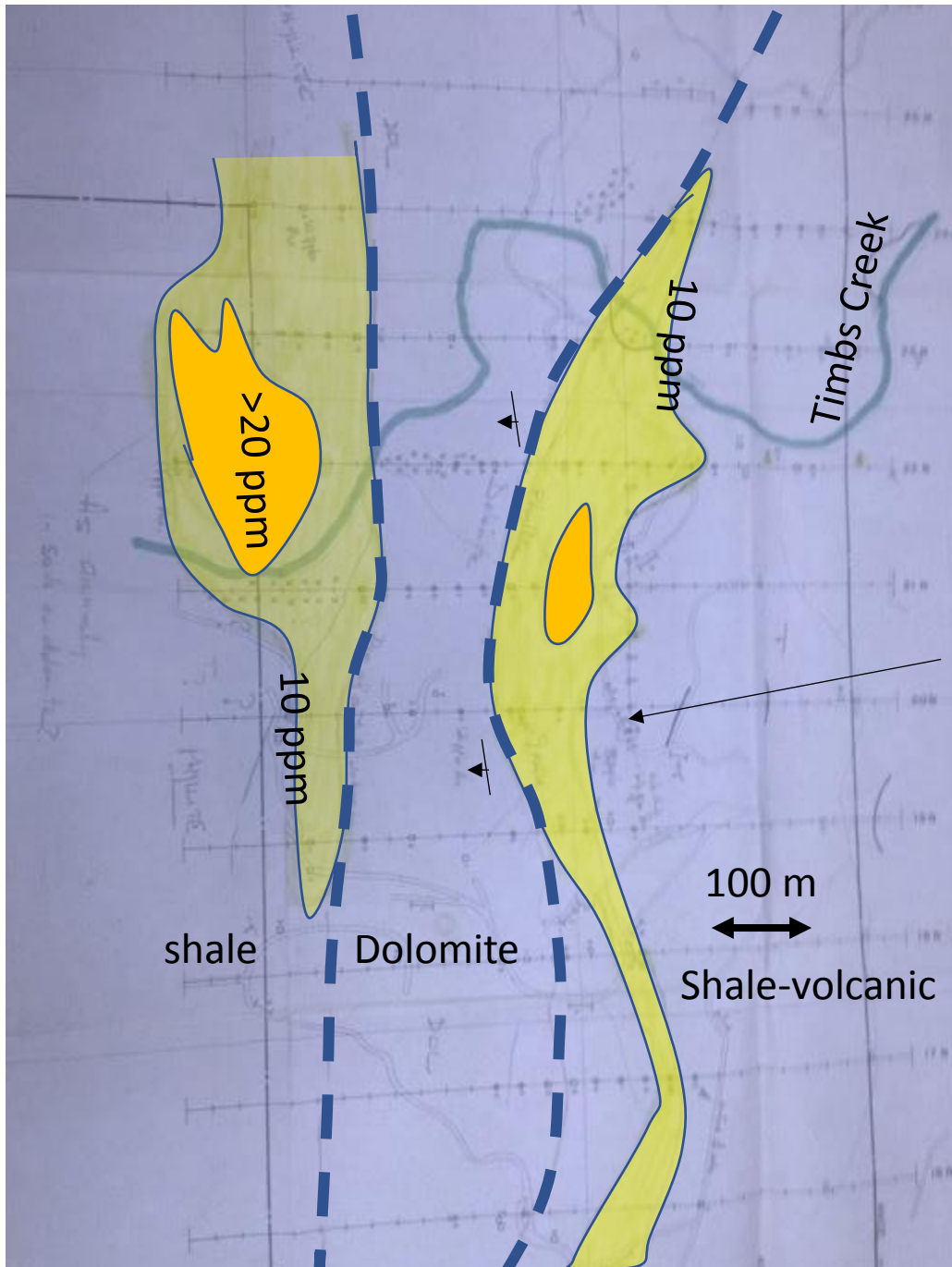


Fig. 13

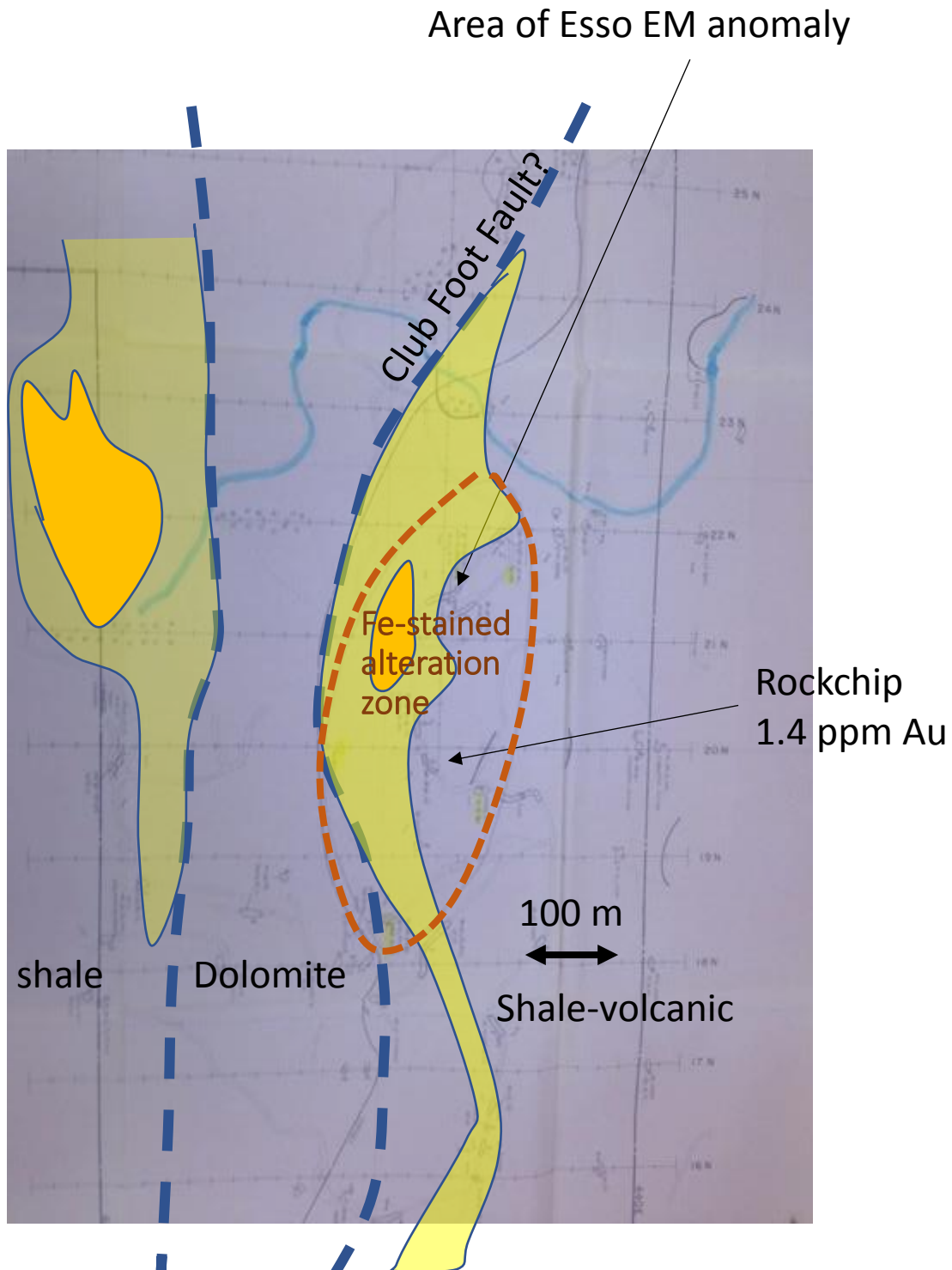
Norgold – Eastside Grid Soil Arsenic



Rockchip
1.4 ppm Au

Fig 14.

Norgold – Eastside Grid Coincidence of Anomalies



Aberfoyle Exploration (1989-90)

- Aberfoyle gridded the Brookside area with 15 lines 100m apart, ~700m long
- Mapping and ground magnetics defined the dolomite-volcanic contacts.
- At Brookside the dolomite is weakly pyritic and brecciated with very minor chalcopyrite and pyrrhotite
- They also mapped sericite-quartz-tourmaline alteration in the Bernafai volcanics.
- Wacker soil sampling defined sporadic anomalies of base metals, but no consistent gold anomaly
- Two linear Zn soil anomalies were defined, one NNW trending ~600m long and the other NNE trending ~400m long.(Fig.16)
- Both are located in the dolomite adjacent to the Bernafai volcanic (shale) contact, to the south of Brookside (Fig. 17)
- Maximum values in the NNE anomaly are 1.35% Zn, 2050 ppm Cu, 2,000 ppm Pb, 70 ppm As, 36 ppb Au
- Pb isotopes indicated two sources of Pb fluids, one Devonian and the other Neoproterozoic.

Brookside Grid and Zn soil anomalies

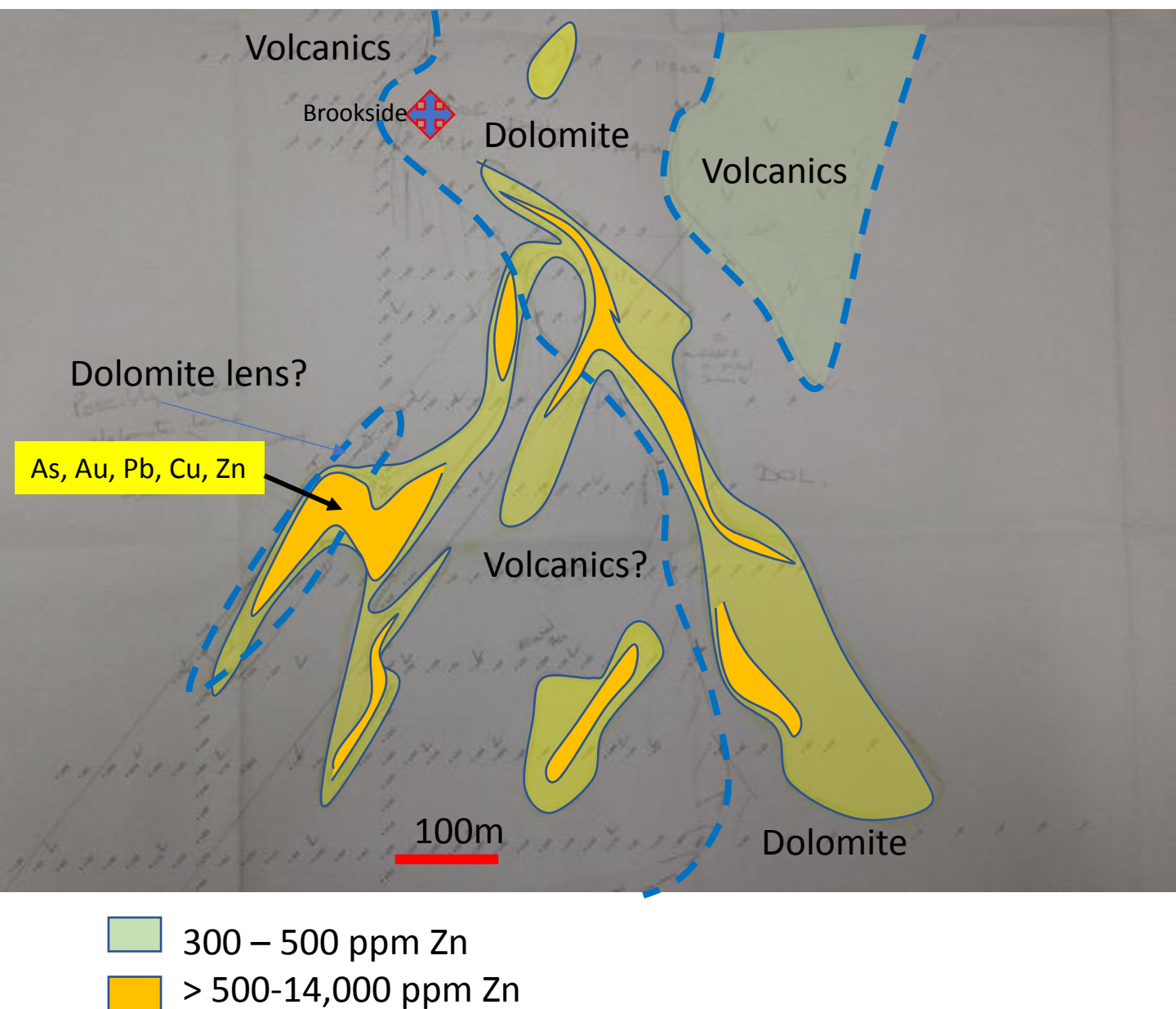


Fig. 16

Soil Geochem Anomalies of As and Zn Superimposed on Geology

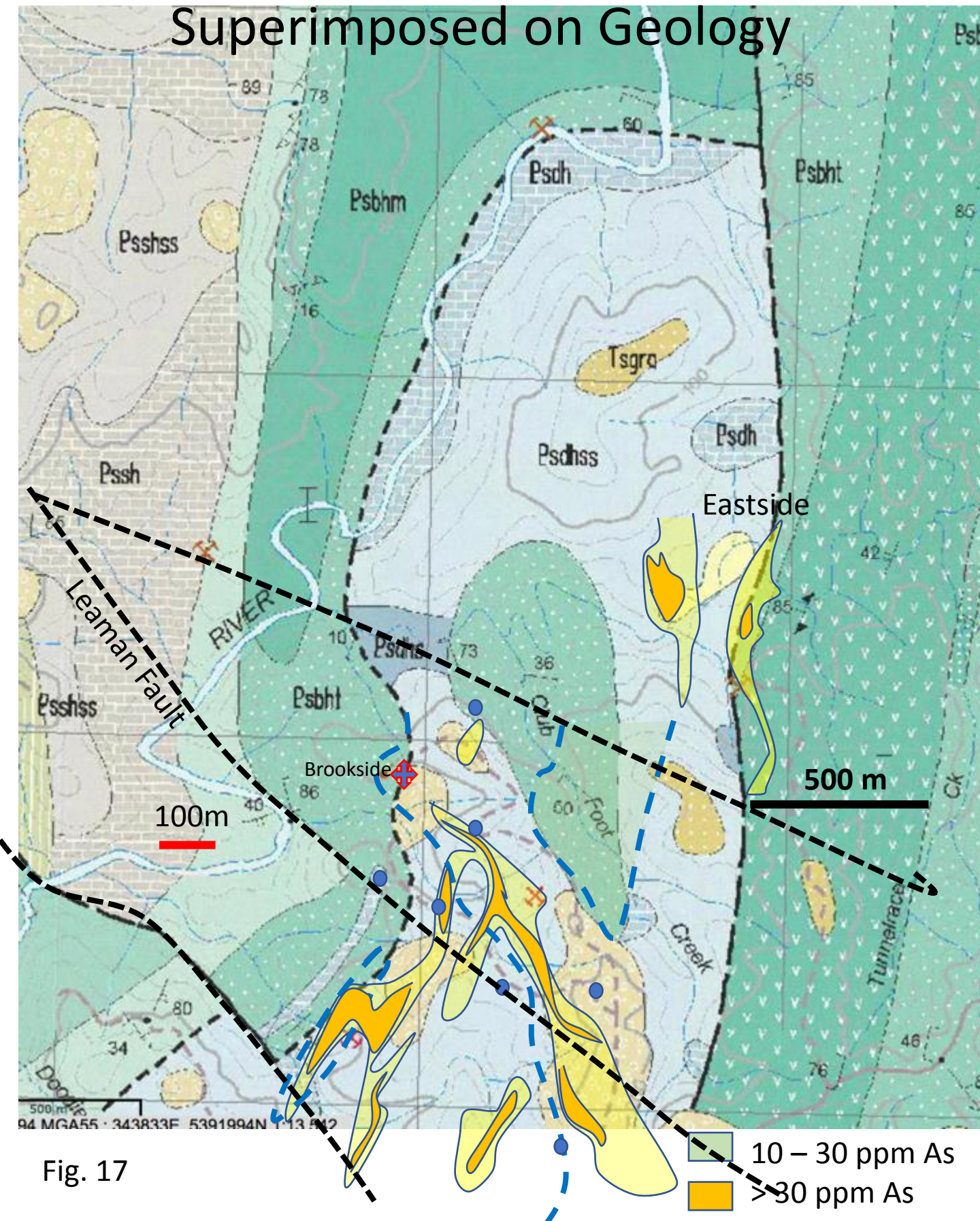


Fig. 17

Aberfoyle Drilling

- Aberfoyle drilled 5 short (< 100m) diamond holes into the so-called Brookside fault
- I say so-called, because no evidence was provided for a faulted contact
- Each hole intersected the contact, but returned only low geochemistry
- Several metres of carbonaceous pyritic shale or phyllite correspond with the fault position on the contact.
- For example in BRK-5, 7.5 m of schistose dolomite, dolomite breccia and black pyritic graphitic schist were intersected at the contact.
- This interval returned 320 ppm Cu, 1150 ppm Zn and 20 ppm Sb, but no significant gold.
- Pyritic black shales maybe present on all dolomite-volcanic contacts in the district

Goldstream Exploration (1997-98)

- An extensive minus 80 mesh stream sediment sampling program covered the TAM mineral leases at that time held by Cominex
- This program demonstrated that streams crossing the major N-S Club Foot Fault down the eastern side of the ML commonly had anomalous Ag and Au values
- One particular creek, Doodie Creek, showed a very high copper and gold anomaly over the N-S fault, which diminished in magnitude on subsequent resampling.
- The samples were taken adjacent to old workings and were possibly contaminated from workings float
- However, irrespective of this issue, the anomaly indicates mineralization of the Club Foot Fault Dolomite-Volcanics contact 2.5 km directly south of the Eastside anomalies on the same contact.
- This extends the length of the potentially mineralize Eastside contact to at least 3 km.

TAM Mineral Leases

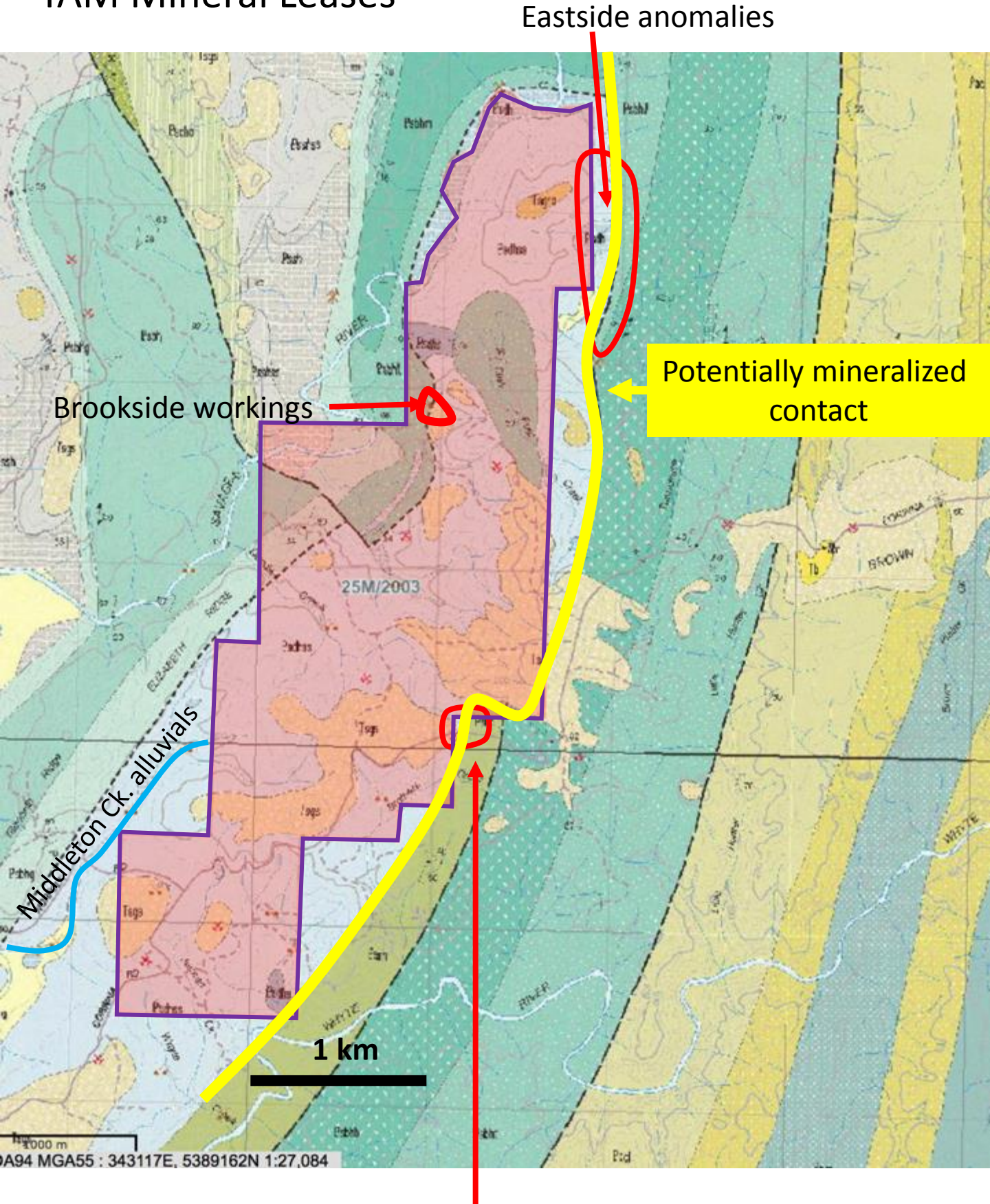


Fig. 18

Doodie Cu-Au stream anomaly

Goldstream Drilling

- Goldstream drilled 10 percussion holes to depths of 50 to 100 m on the TAM mineral lease.
- Some of the hole collars are shown on Fig. 17. Other collars are off the map to the south.
- The holes demonstrated the very erratic nature of the geochemistry in the dolomite and volcanics.
- The most significant features were:
 - weak gold (10 to 200 ppb) was found in both the altered pyritic volcanics and silicified dolomites adjacent to the dolomite-volcanic contacts
 - The shallow depth of Corinna Dolomite in the small syncline basins (< 100 m; Fig. 20)
 - The best gold values were recorded on GRD04 within shales of the Bernafai volcanics on the dome-anticline structure
 - rhodochrosite (Mn-carbonate) alteration was observed in dolomite that contained anomalous gold. This indicates that Mn should definitely be part of the geochemical package in future work.
 - No other element was consistently correlated with gold

Origin of Brookside Alluvial Gold

- The Aberfoyle and Goldstream drilling and geochemistry failed to resolve the origin of the crystalline gold at Brookside
- However their work did reveal extensive As anomalies along the Corinna dolomite – Bernafai Volcanics contacts with sporadic low level gold (50 to 150 ppb)
- My conclusion is that the As is derived from thin pyritic carbonaceous shale units on the contact, and these sulfidic black shales are also the source of the gold and base metals.
- This is common for pyritic black shales of this age (550 to 600 Ma), e.g., Sukhoi Log in Russia.
- Erosion of the 15+km of Dolomite-Volcanics contacts over the last few million years would supply enough gold to account for the alluvial gold in the Corinna Gold Field
- An economic accumulation of hard-rock gold in the contact graphitic shales at Corinna is a possibility – **but would require structural up-grading such as an anticline axis or a shear zone.**

Middleton Creek, EL 20/2016

- Middleton Creek was a focus of active alluvial gold mining in the past.
- The creek runs NNE roughly parallel to the Corinna Dolomite – Bernafai contact on the eastern side of the Corinna syncline, 2km south west of Brookside (Fig. 13)
- Elevated gold in the alluvials may be derived from weathering from the altered bedrock along the Dolomite-Volcanic contact
- However the gold grains are both rounded and sub-angular attesting to both medium and long distant travel (Hugh Nolan, pers. comm.)
- It seems likely some of this alluvial gold is sourced outside the current tenements, but a significant portion may come from the nearby dolomite-volcanic contact
- No hardrock gold geochemistry has been revealed by previous sampling.

Anticline axes in the Corinna Goldfield – Best Targets

- The folding in the district is an open style and there are no mapped tight anticlines of the Sukhoi Log type
- However, although the overall Corinna structure is a syncline, there is a second order anticline or dome in the center of the syncline (Fig. 19)
- This presents a target at about 250 to 400 m depth where the contact of the Savage Dolomite and Bernafai Volcanics is in an anticlinal position (Fig. 20) and could be a structural trap for gold
- Leaman (1987) in his geophysical interpretation report for EZ suggested that the Eastside anomaly was also in a N-S trending anticline.



Best Shallow Anticline targets



Potential Gold zones at Contact

Geology Cross-Section A-B

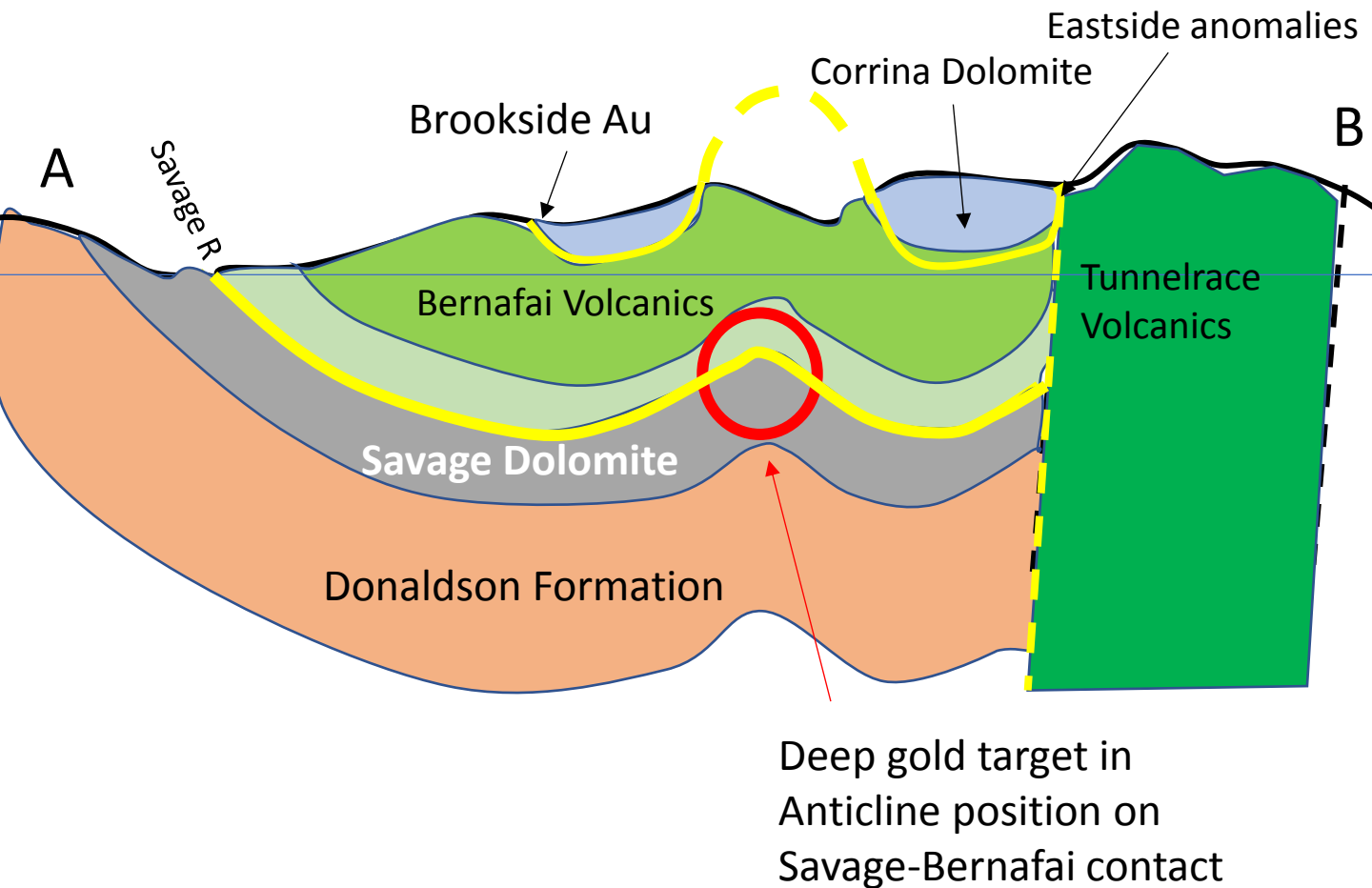


Fig 20.

Potential Shear Zones or Faults as Gold Targets at Corinna

- Nick Turner on the 25,000 MRT Geology Map shows the western Corinna Dolomite – Bernafai Volcanics contact as a fault even though it is a stratigraphic relationship.
- Sheared carbonaceous shales along this contact may give the impression of a fault
- A far more likely fault or shear zone is the contact of the Corinna Dolomite and Tunnelrace volcanics to the east (Club Foot Fault)
- The Eastside arsenic anomalies and airborne EM6 anomaly lie adjacent to this fault. Also, mapping by Norgold, recorded outcrops of sheared sedimentary rocks along the fault
- The NW trending faults; Savage, Leaman and K-faults, may also have been a focus for gold-bearing fluids. The intersection of the Leaman and Club Foot faults corresponds with the Doodie prospect
- **Eastside is the best candidate for a shear-zone related gold target. But potential exists all along Club Creek Fault (Fig. 21)**

AEROMAGNETICS

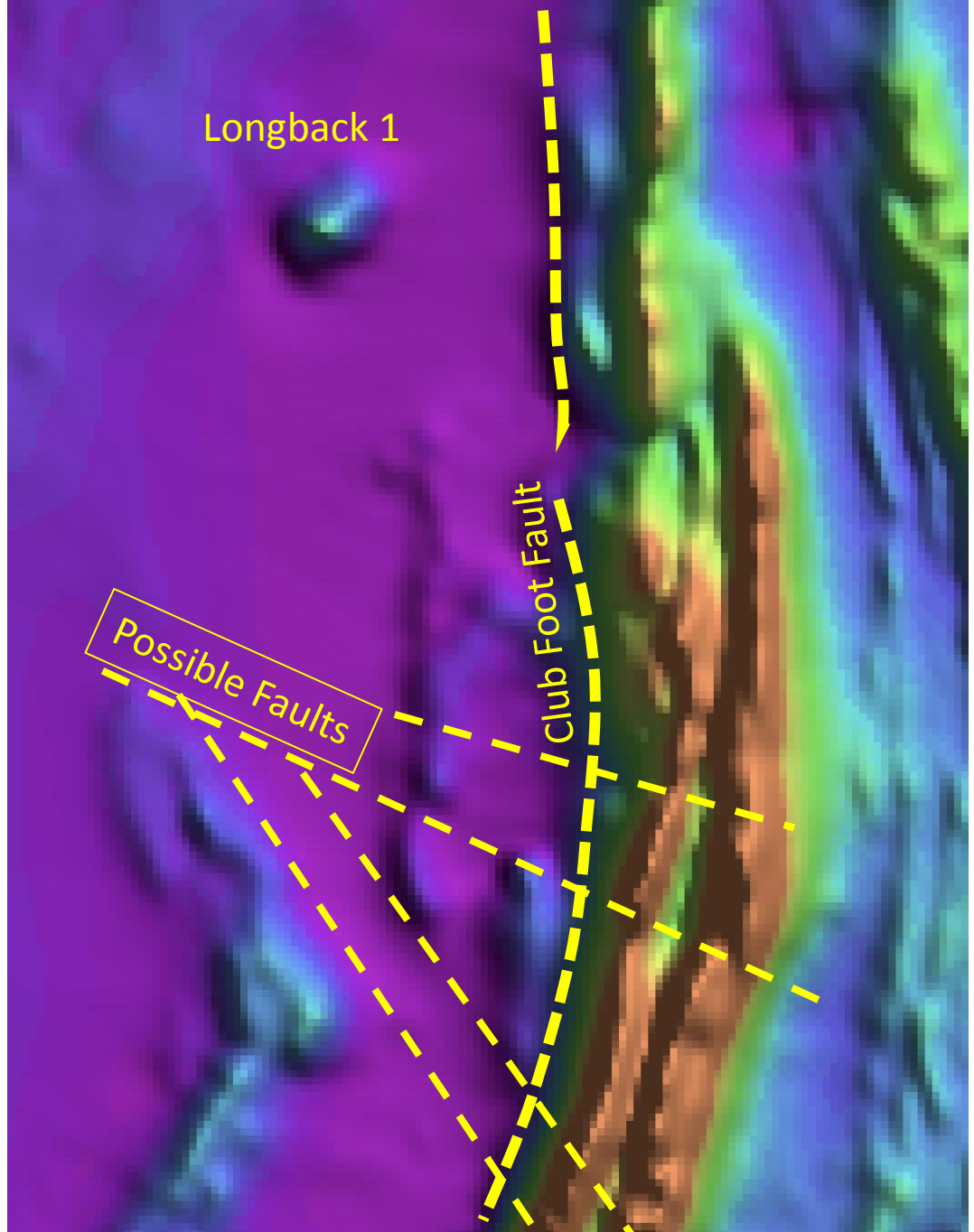


Fig. 22

Regional Radiometric Survey

- A radiometric survey of the Corinna Brookside area has been reported in Turner, Reed and Morrison (2003): MRT Record 2003/15 (Fig. 23)
- A large uranium anomaly covers the central volcanics dome east of Brookside and extends across to the Eastside Prospect (Fig. 24). This probably is caused by U-bearing black shales which are potentially the host for gold-arsenic mineralization at Eastside
- A second U-anomaly occurs 300 to 500m west of Brookside, centred on the Savage Dolomite – Bernafai Volcanics contact. This suggests the presence of a thick pyritic black shale on the contact
- This U – anomaly is associated with a K-anomaly situated at the southern end of the U-anomaly adjacent to a major north-west trending fault. The K anomaly may be caused by strong sericite alteration on the northern side of the fault and should be a focus for follow-up exploration.
- Au-Cu stream sediment anomalism is in the vicinity of the K-anomaly. Aberfoyle soil sampling over part of the K-zone recorded significant Cu (up to 1100ppm) and Au (up to 36 ppb)
- This U-K anomaly area is referred to as the K-prospect (Fig. 24)

Regional Radiometric Survey (Turner et al., 2003)

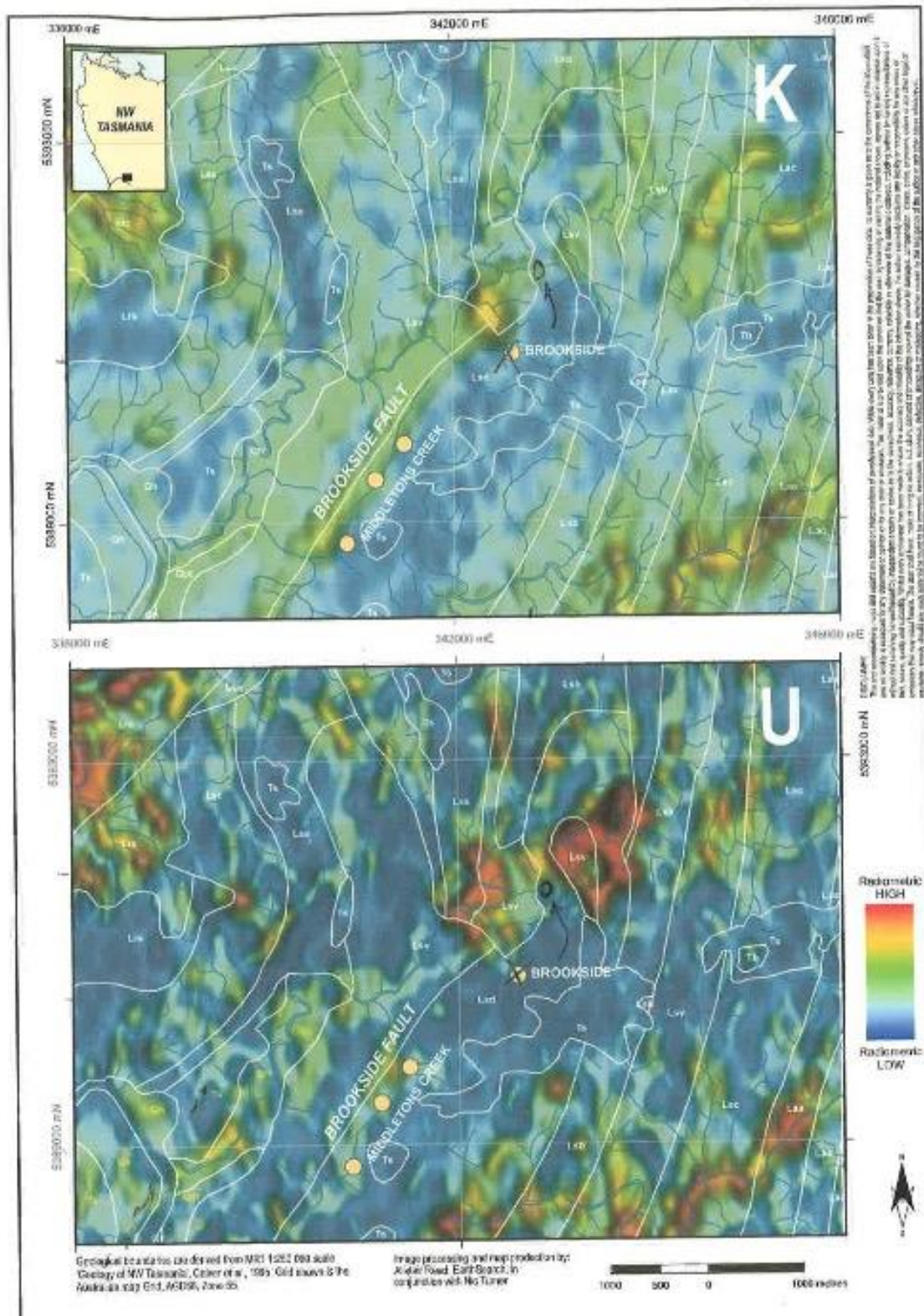


Fig. 23

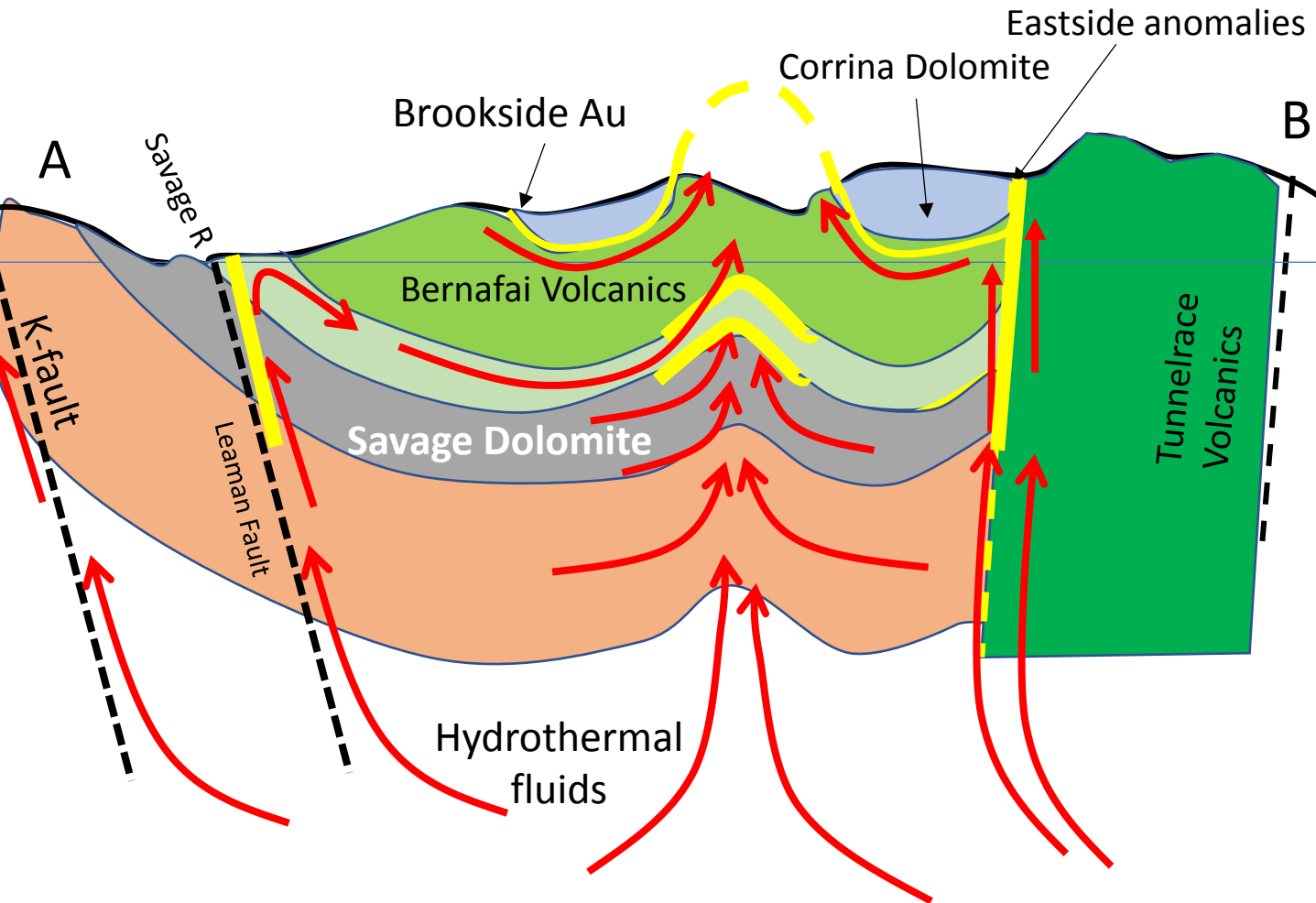
Locations of Radiometric Anomalies



Fig. 24

Fluid Flow Model for Corinna

Geology Cross-Section A-B



Gold bearing hydrothermal fluids move upwards along fault zones (K-fault, Leaman and Club Foot faults) and the central anticline axis

— Potential Gold zones

Fig 25

Suggested Targets to Explore

1. **EASTSIDE PROSPECT:**

- Located on the major Club Foot Fault or Shear Zone
- Corinna Dolomite – Tunnelrace Volcanics contact
- Coincident with airborne EM6 anomaly
- Extensive zone of Fe-stained and sheared shales
- Two linear arsenic soil anomalies
- One rock chip sample of 1.4 ppm Au

• **RECOMMENDATION**

- Apply for tenure over the prospect and Club Foot fault zone north and south (Fig. 16)
- Re-establish central part of Norgold grid and extend selected lines into Cominex ML by 400 m
- Repeat soil (Wacker) sampling over the two As anomalies if required
- Locate centre of EM6 with either ground IP or EM
- Drill best target – may require two drill holes of 250m each

Suggest Tenure Application

Eastside anomalies

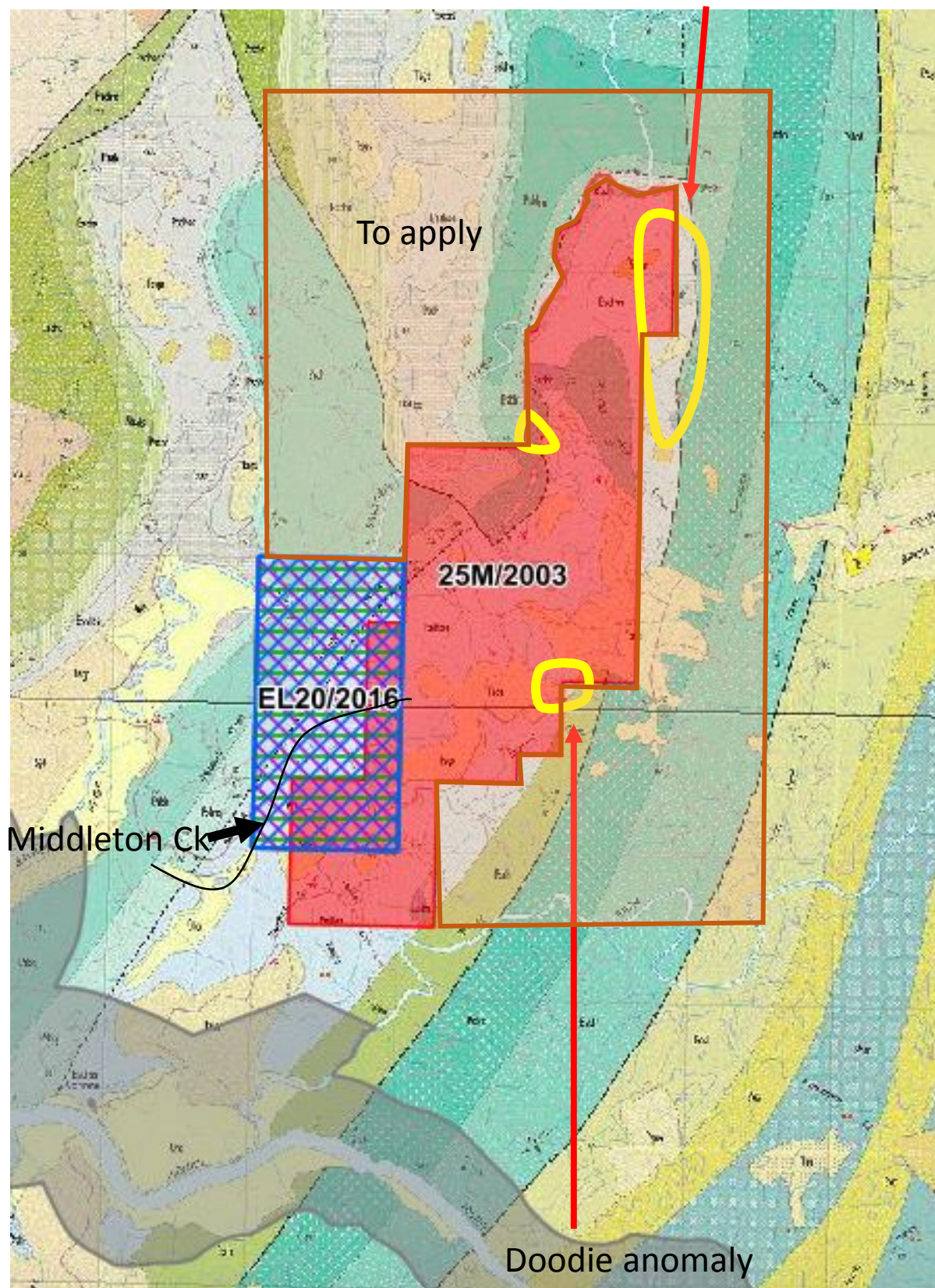


Fig. 26

Suggested Targets to Explore

2. DOME POSITION BELOW CORINNA DOLOMITE:

- This is a blue sky target to test the anticline-gold theory
 - Deep anticline position based on surface geology and cross section construction (Fig.20)
 - Testing contact between Savage Dolomite and Benafai Volcanics in anticlinal structure at about 250-400m depth.
 - Supported by anomalous gold and Hg in drill hole GDR04 within shales/volcanics close to the anticline axis
 - Expect more intense gold mineralization and better gold grades in centre of anticline at depth
 - Analogous to structural anticline gold of Carlin type and Sukhoi Log type
-
- RECOMMENDATION
 - Establish drill site in centre of Bernafai Dome close to Club Foot Creek
 - Drill vertical hole 250-400m to test theory.

Suggested Targets to Explore

- 3. K PROSPECT - Zn-Cu-Pb-Au-As Soil Anomaly and K-U anomaly,**
400-500m south of Brookside. Maximum Zn in soils of 1.35% Zn
- This is the best zinc-copper anomaly on the grid
 - The zinc anomaly is associated with a carbonate lens in the mafic volcanics
 - A K-U radiometric anomaly lies directly west of the Zn-geochem anomaly; this expands the size of the target and suggests an extensive zone of potassic alteration north of the K-Fault that may relate to mineralization formed from fluids moving up the NW trending K Fault
 - The K-altered zone has anomalous Cu and Au geochemistry in streams and soils
- **RECOMMENDATION**
- Cut a new E-W grid over the area; about 7 X 700m lines, 200m apart (Fig.28)
 - Detailed mapping, soil (wacker) and rock chip sampling on grid
 - K-U spectrometer survey
 - IP survey over soil and K-U anomalies
 - Drill target if data is encouraging

Suggested Targets to Explore

4. **DOODIE stream sediment Cu anomaly**

- Very anomalous Cu and lesser Zn, Pb, As, Au at the headwaters of Doodie Creek
- Close to the Corrina Dolomite – Tennelrace Volcanics contact at the intersection of Club Foot Fault and Leaman Fault
- Very favourable geological location
- 2 km south along the Club Foot Fault from the Eastside prospect
- Old copper workings close by

• **RECOMMENDATION**

- Wait for results from Eastside drilling.
- Establish a small grid, 500m X 400 m
- Mapping of gridded area
- Wacker sampling on grid
- IP or EM on grid
- Drill best target.

Recommended Drill Targets

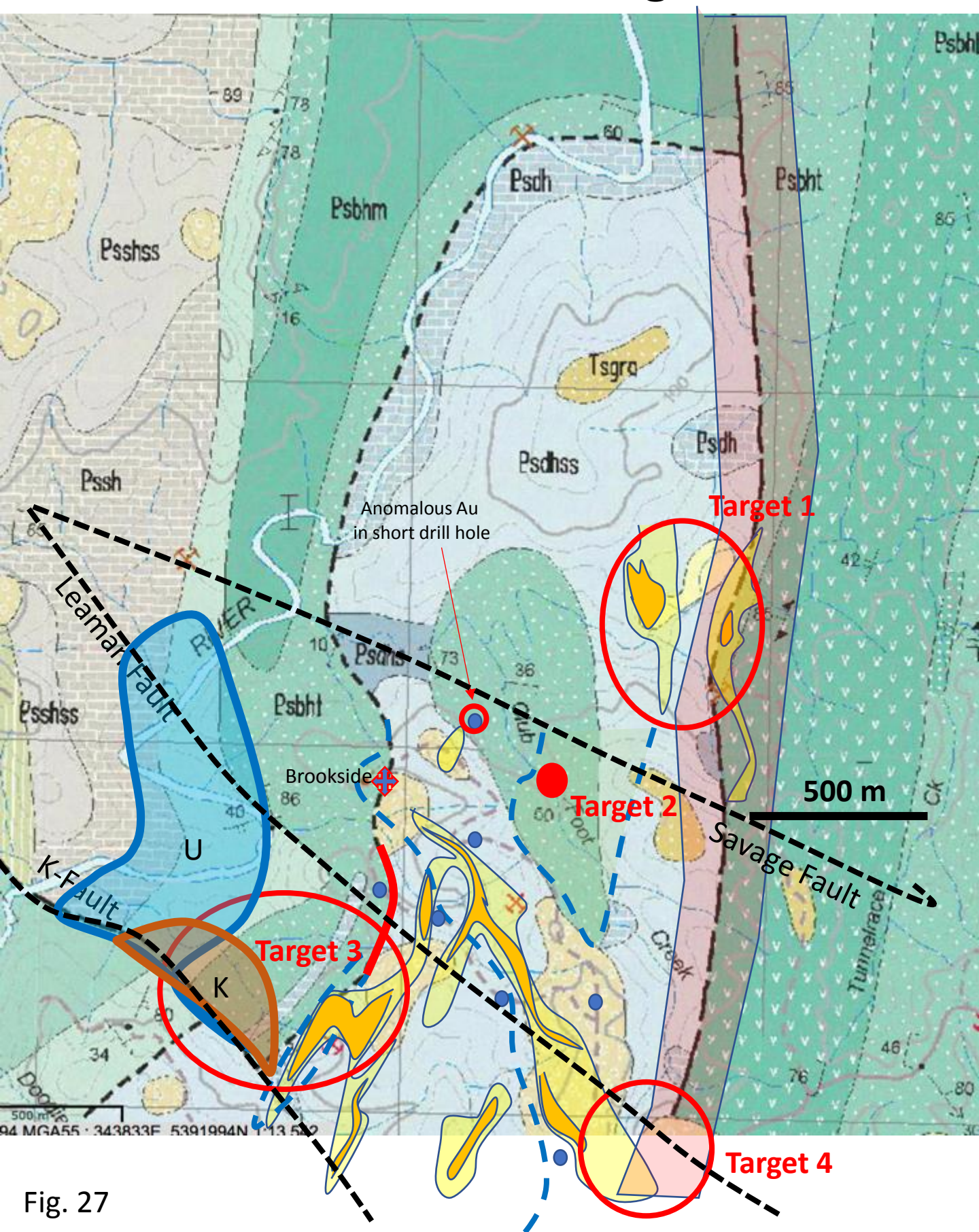


Fig. 27

Suggested Targets to Explore

ALTERNATIVE STRATEGY TO EXPLORE EASTERN FAULT CONTACT

- The faulted contact between Corinna Dolomite and Tunnelrace Volcanics has a north-south extent of over 4 km
- There are two gold-copper prospects on the contact (Eastside and Doodie) and potential exists for significant mineralization elsewhere along the contact.
- Rather than focusing exploration at Eastside and Doodie, a better strategy may be to explore the complete length of the contact on a broad spaced grid, lines 200m apart and ~600 m length (Fig. 28)
- This would require about 20 km of gridding followed up by:
 - Magnetics to accurately pick the dolomite/volcanics contact
 - Soil sampling (wacker) and rock-chip geochemistry to outline the arsenic anomalies
 - EM or IP to define sulfide zones

This alternative strategy is a more systematic approach that may define new targets not currently recognized. However it will take more time and expense to cover the complete 4kms of favourable contact.

Grid Eastern Boundary & Target 3

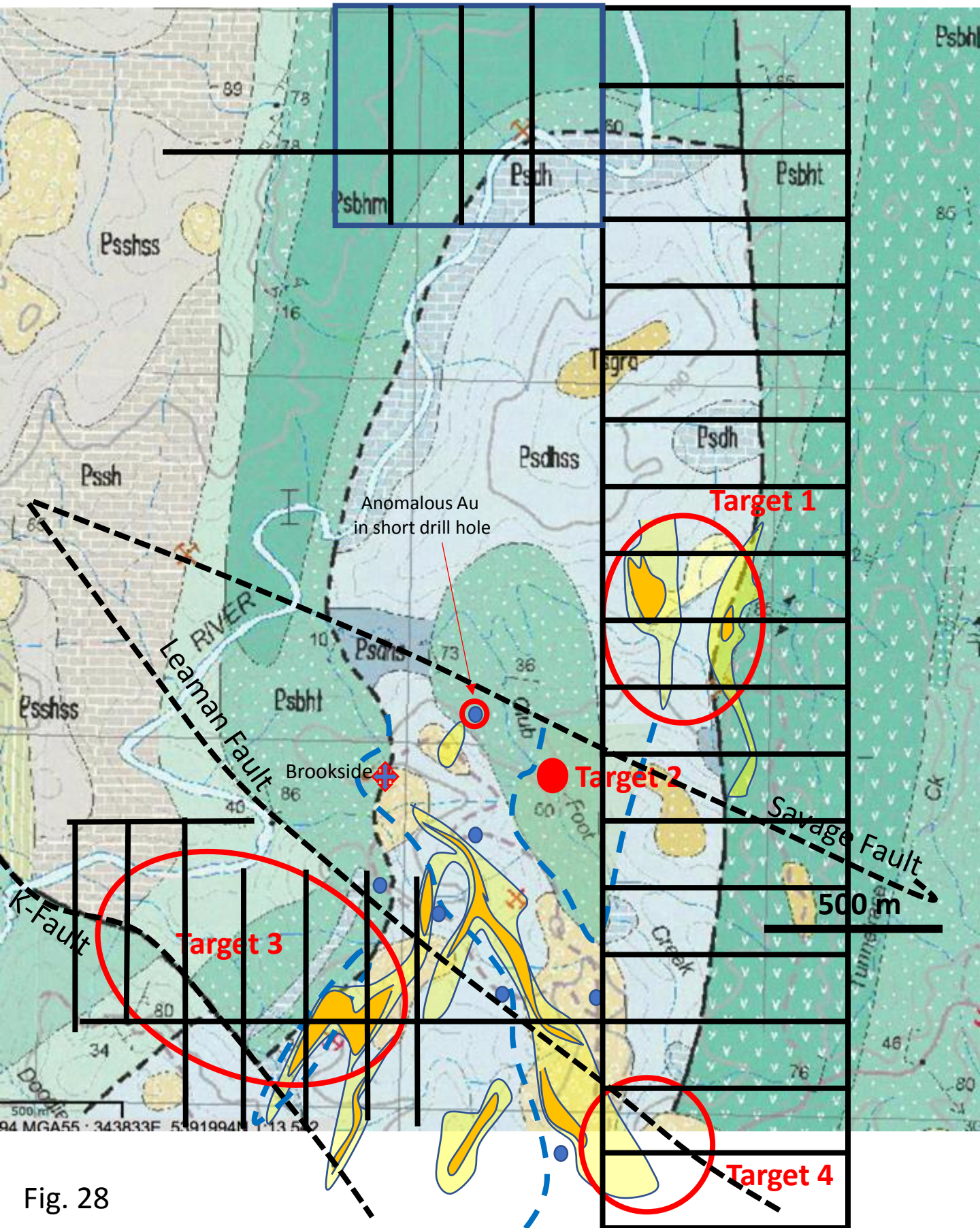


Fig. 28

Conclusions

- This review of all previous exploration data indicates that a large hydrothermal system was active in the Corinna Goldfield with gold-arsenic- bearing fluids penetrating along the contacts between dolomite and mafic volcanics.
- However, evidence to date indicates very low grade hard-rock gold at the few sites that have been tested.
- Potential exists for an economic gold deposit developed on one of the dolomite-volcanic contacts especially associated with an anticlinal position or a shear zone
- However there is greater than 30 km of contacts to assess
- Four targets have been identified for follow-up on or close to the contact
 - The Eastside prospect, developed over a regional shear zone separating Corinna Dolomite and Tunnelrace Volcanics. A coincident EM anomaly and As soil anomaly is the target.
 - A deep anticline target about 400 m east of Brookside. The target lies at about 250-500m depth; contact between Savage Dolomite and Benefai Volcanics may carry gold mineralization in the peak of the anticline. High risk target.
 - A strong zinc, copper, lead, arsenic soil anomaly and associated K-U anomaly 600m south of Brookside which indicates a broad zone of alteration and mineralization adjacent to a NW trending fault
 - A strong stream copper anomaly (Doodie), 2 km south from the Eastside prospect, and on the same high priority fault target.
- An alternative, longer term strategy, is to explore the full length of the eastern dolomite contact with the Tunnelrace volcanics. This is a more thorough approach but more expensive and time consuming (Fig 28).

The map displays a geographical area with various locations and geological features. A yellow dashed line runs diagonally across the map, and several red circles are placed on specific points. The locations and features are as follows:

- Locations:** Sabbath Creek, New Donaldson, Longback 4, Longback 3, P12, Brookside Workings, Area 12, Savage River Alluvial, Doodie Creek, Unnamed, Middleton Creek, Hollands, Corinna Silica South, Jarman Creek, and several other unnamed locations.
- Geological Features:** P18, L23, P12, and various other points marked with symbols.
- Other Features:** A yellow dashed line and several red circles highlighting specific points of interest.

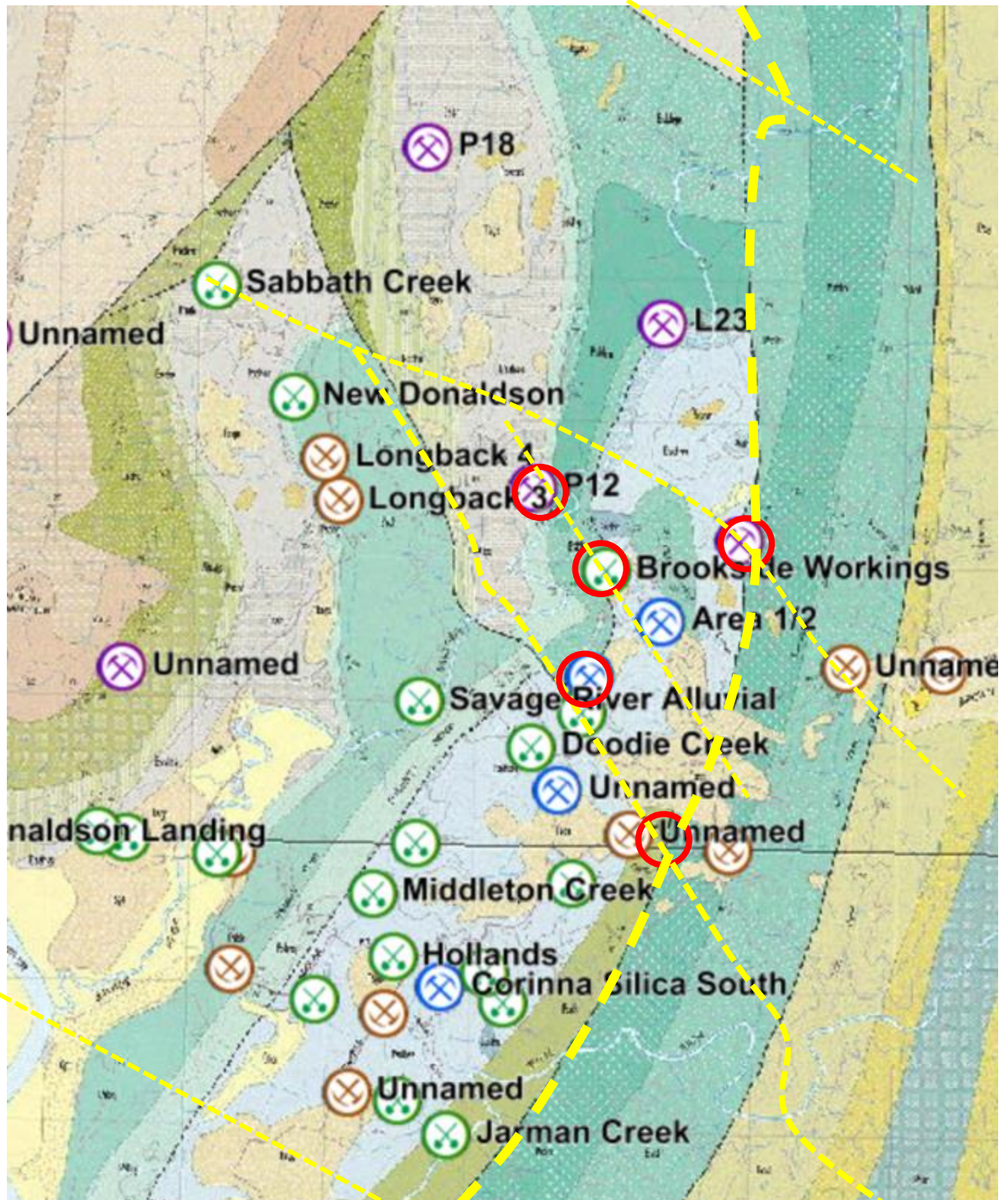


Fig. 30.