The Bunsai prospect

An eluvial
Au-Bi-Sn play,
Mt. Kitchin area,
Mungana 1:100,000 Sheet area,
Far North Queensland

Geological Report
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July 2004 – March 2006

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FIGURES

1. Introduction and Background

This report introduces the **Bunsai Prospect**, a recently conjured anagram containing the three elements of interest at the prospect, namely Au, Bi and Sn.

Historically, the area was visited by G.M. Derrick in November 1987 in the company of Mr. Joe Wood, owner of Mining Lease 5194 which covers portion of the Bunsai Prospect. The visit follows exploration in the area in previous years (1980-82) by Houston Oil & Minerals.

This visit left some lasting impressions geologically – the presence of native bismuth nuggets in eluvium (see Cover photo of Report), found by metal detecting, strong Au-Sn-Bi anomalism in stream and soil geochemistry, and significant, impressive pan concentrate returns from the quick panning of a few trial samples of eluvium and alluvium.

With the memory of the 1987 visit still intact, it is time to draw together the geological threads of this prospect area into a formal report, incorporating both past company and private data which have been gathering dust for many years in old filing cabinets.

This report intends to reassess the old data, add to it as much post-1987 data on company and lease holder activity as is relevant, and examine whether any opportunities exist at Bunsai for a small company eluvial mining operation producing not one, but three, high-value commodities.

2. Location, Access

Bunsai is located 50 km due west of Chillagoe, North Queensland, which links to Cairns on the coast 150km to the east (Figure 1). In 1987 the prospect was accessed by rough bush track extending south then west from the old Cardross Cu mine on the Rookwood-Blackwood road near the junction of Muldiva Creek and the Walsh River. Air photographs taken in 1996 show a more recent and well-formed track passing 1-2 km SE of the Bunsai prospect area, and which appears to diverge south-westwards from the Cardross-Butterfly spring track near Nundah Creek, as shown in Figure 2, an extract from the Mungana 1:100,000 map sheet. This may have served exploration effort in the Mt. Kitchin area in the mid-1990s.

3. Present Tenure

Bunsai is located in and around ML 5194, which itself is contained within EPMs 8939 and 10679. A departmental printout of tenures current as at 5 December 2002 is shown as Figure 3. An updated version of this is shown in Figure 4, current to 25 June 2004, and this shows no change in tenure circumstances in the immediate vicinity of the Bunsai project. Details of tenement holders are as follows, from departmental searches:-

EXPLORATION PERMIT (MINERAL) SHORT REPORT	
Tenure Number	EPM 8939
Principal Holder	QUEENSLAND EPITHERMAL MINERALS LTD
Status	GRAN
Sub Status	RENL
Lodgement Date	1992-07-01

Figure 1: Regional location Map of Bunsai project area, 200km west of Cairns

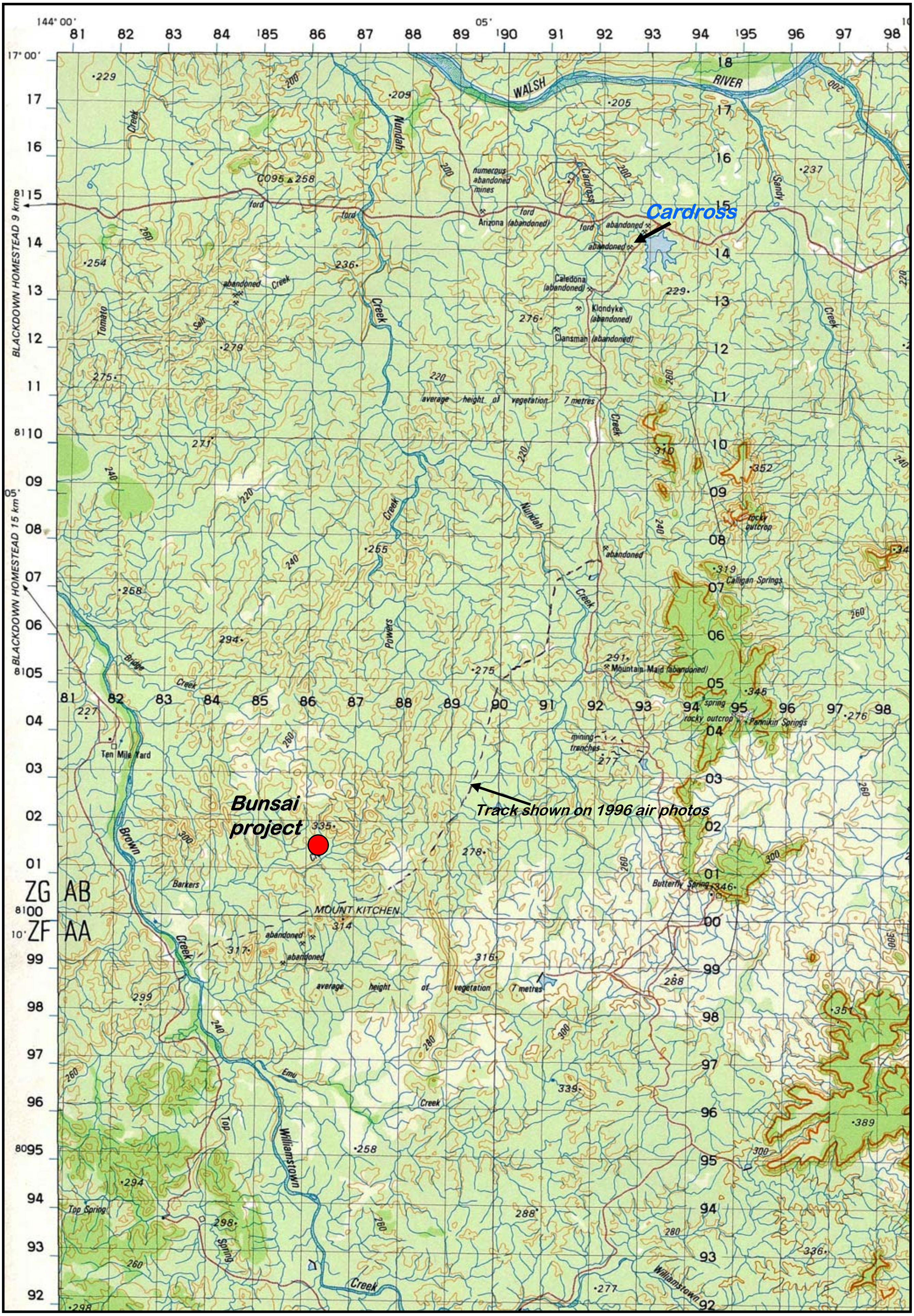


Figure 2: Location Map of Bunsai project area, on Mungana 1:100,000 topo. base

EXPLORATION PERMIT (MINERAL) SHORT REPORT	
Tenure Number	EPM 10679
Principal Holder	QUEENSLAND EPITHERMAL MINERALS LTD
Status	GRAN
Sub Status	RENL
Lodgement Date	1995-06-01

EXPLORATION PERMIT (MINERAL) SHORT REPORT	
Tenure Number	ML 5194
Previous Tenure Number	ML3993MARE
Lease Name	BARKERS
Lease Area	43.52
Lease Surface Area	43.52
Principal Holder	WOOD Joseph Herbert
Date Granted	08-May-1986
Date Expires	31-May-2007
Status	GRAN

Both EPM 8939 and EPM 10679 are held by Queensland Epithermal Minerals, whose principal appears to be Al Marton of A. Marton & Associates. Searches of the departmental QDEX data base focussed in the first instance on EPM 8939, since a search on EPM 10679 produced "No Reports" for the period 1990 – 1999. However, the area was explored as EPM 8899. For EPM 8939, four company reports are available for the period 1990 – 1999; a further 11 reports are available for the period 2000 – present, but these are listed as confidential by the Department. The four published reports are as follows:-

Exploration Permits Mineral 1990-99		
EP Number	Title	CR Number
8939	EPM 8939, MUNGANA PORPHYRY, PARTIAL RELINQUISHMENT REPORT FOR PERIOD 19/8/92-20/10/93	26066
8939	EPM 8939, MUNGANA PORPHYRY, PARTIAL RELINQUISHMENT REPORT FOR THE PERIOD ENDING 22/7/96	29968
8939	EPM 8939, MUNGANA PORPHYRY, PARTIAL RELINQUISHMENT REPORT FOR THE PERIOD ENDING 22/7/97	29970
8939	EPM 8939, MUNGANA PORPHYRY PROJECT, PARTIAL RELINQUISHMENT REPORT FOR PERIOD TO 18/8/98	32015
8899	FINAL REPORT ON EPM 8899 "CARDROSS" FOR THE PERIOD ENDING 23 MARCH 1993 BY P. CREENAUNE, NEWCREST MINING LTD	24683

All of these reports are relinquishment reports of the most basic kind, being well-padded and with minimum information. Earlier work in the vicinity of the Bunsai project was conducted by Houston Oil & Minerals in 1980-82 on what was then ATP2298M, "Poison Creek". Their reports are comprehensive and informative, in stark contrast technically to the sub-standard material produced by A. Marton & Associates and his various companies.

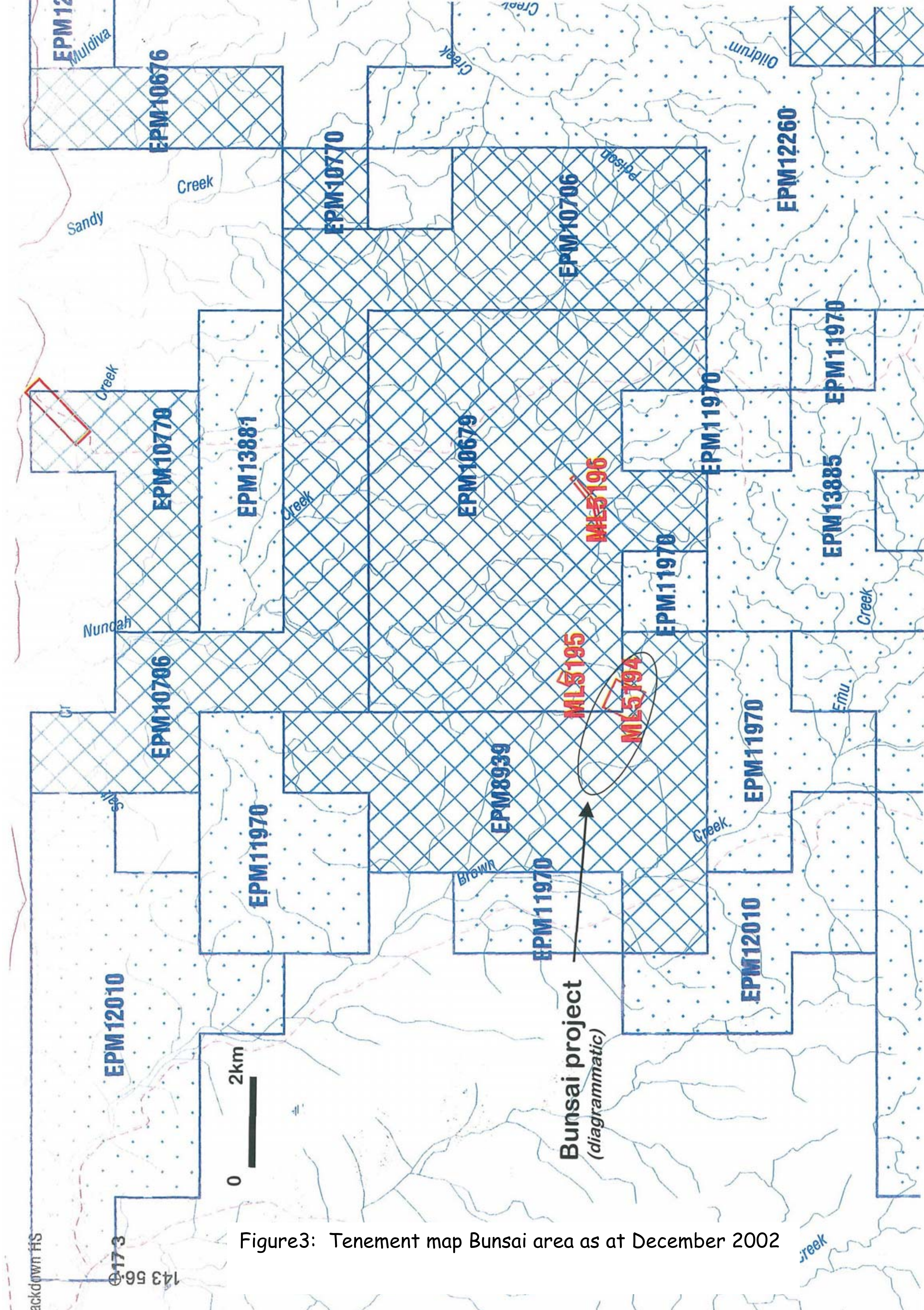


Figure3: Tenement map Bunsai area as at December 2002

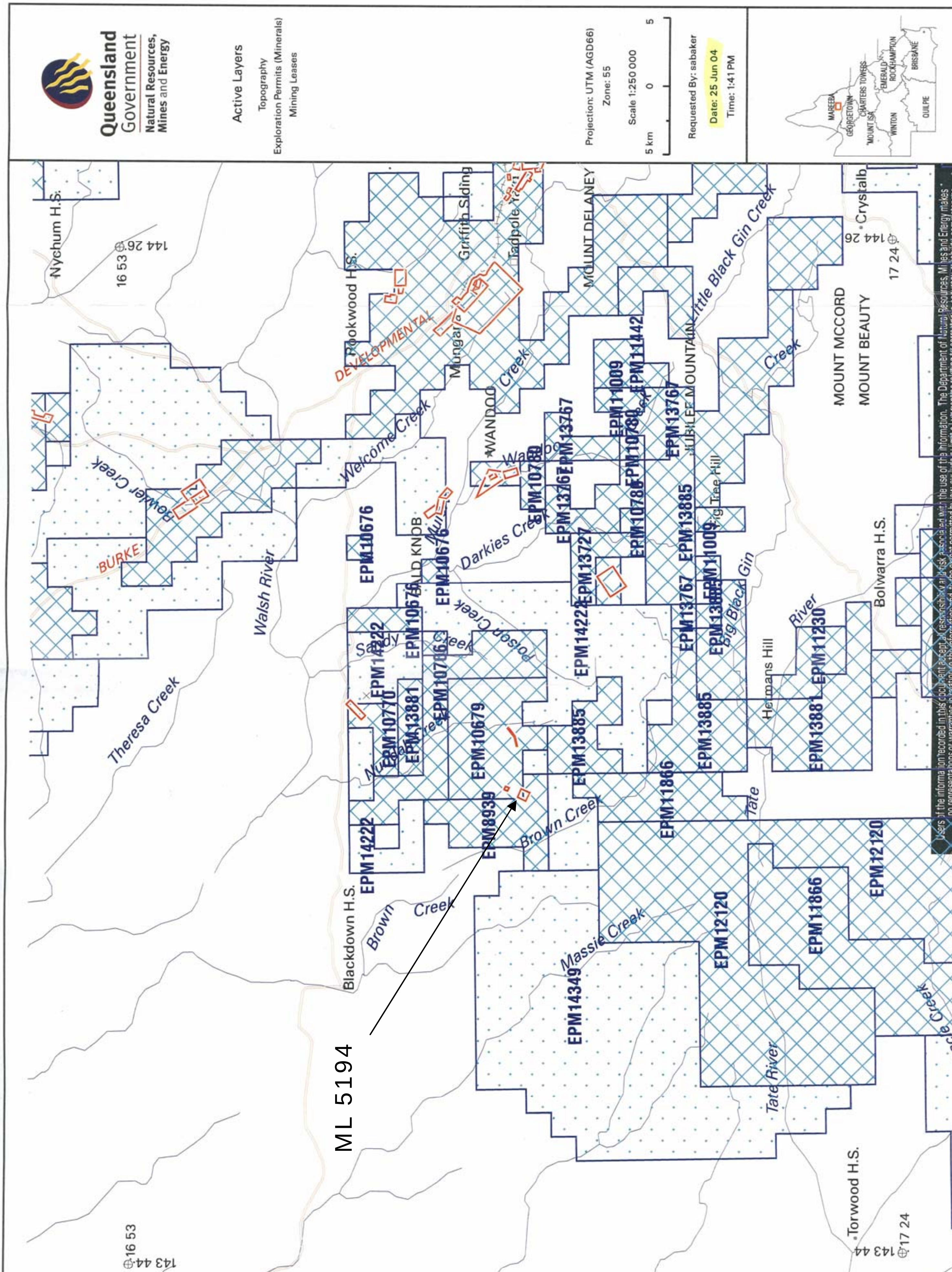


Figure 4: Tenement map Bunsai area as at June 2004

4. Comments on Past Tenure and Reporting

4.1 ATP 2298M: Houston Oil & Minerals (HOMA) CR 8637, 9411, 1981-82, CR11039.

Both G.M. Derrick & J. Wood (holder of Mining Lease ML5194) were former employees of HOMA, but only field assistant and prospector Joe Wood was actively in the field, with project geologists A. Barton, D. Lovett, A. Johnston, G. Peterson and others. Following, or concurrent with, relinquishment of the EPM by HOMA, Wood sought permission from HOMA to peg a mining lease in 1986, on the basis of certain anomalous stream sediment and rock chip results which, while anomalous, were too small and of no interest to HOMA as a large company project. G. Derrick visited the project in October 1987 on behalf of Noble Resources, who also held the Wandoo porphyry project nearby; Joe Wood showed G. Derrick aspects of Bunsai geology, which led to certain sampling and assaying (reported later) in ML 5194 and in the vicinity. Noble Resources terminated as an entity in 1988, and no joint venture between Wood and Noble Resources ever eventuated.

Since 1987-88, Wood has retained his mining lease and has probably conducted various small scale mining and 'scratching' programs on the lease since then; G. Derrick retained the notes and sampling results of the 1987 field visit, and they form the basis of this report on the Bunsai project, having been sitting quietly in a filing cabinet for 19 years or so.

Summary of HOMA Results

In their Poison Creek ATP 2298M HOMA conducted rock ship, soil and stream sediment coverage and found zones of tin, gold and tungsten anomalism worthy of follow-up.

They erected three x 40m grids – Barker Creek (Au, W, Sn), the adjoining Detonator Creek (Au, W, Sn) and Priors Creek (Sn). The locations of these grids are shown in Figure 5 (modified by GMD from HOMA sketch). These grids were soil sampled, and the Barker Creek – Detonator grids were mapped at 1:100 scale, with some further rock-chip sampling. A portion of their grid geological map for Barkers Creek is shown here as Figure 6; the details are largely illegible, but they have been transcribed onto another figure shown later in this report. Figure 6 shows location of some old alluvial workings, some old costeans and accurate location of drainage and various outcrops.

Grid geology described by HOMA includes presence of a foliated medium-grained adamellite mapped as Nundah Granite, mainly in the northern half of the Barker Creek grid, and quartz-mica schist with pegmatoid throughout most of the southern half of the Barker Creek grid – probably Dargalong Metamorphics. They noted a few ENE-trending rhyolite dykes and minor amphibolite. Much of the granite showed pervasive sericitic alteration. Many faults and joints trend N to NNE and contain Sn, and are cut by E and ENE – trending fractures. The various fracture systems contain limonitic-goethite after sulphides, quartz and sericite-muscovite 'greisen' which host most of the known Sn, As, Au, W, Bi and Mo mineralisation.

An orientation soil survey showed the following:

- A soil profile was developed, with the B horizon located 15 to 25 cm from surface.
- Sn was concentrated in the -30+100 (0.5m to 0.125 mm) size range.
- Evidence of mechanical enrichment of Sn in the top 10 cm of the soil profile.
- For Au, the -100 mesh fraction (-0.125mm) was a sensitive indicator of mineralisation.

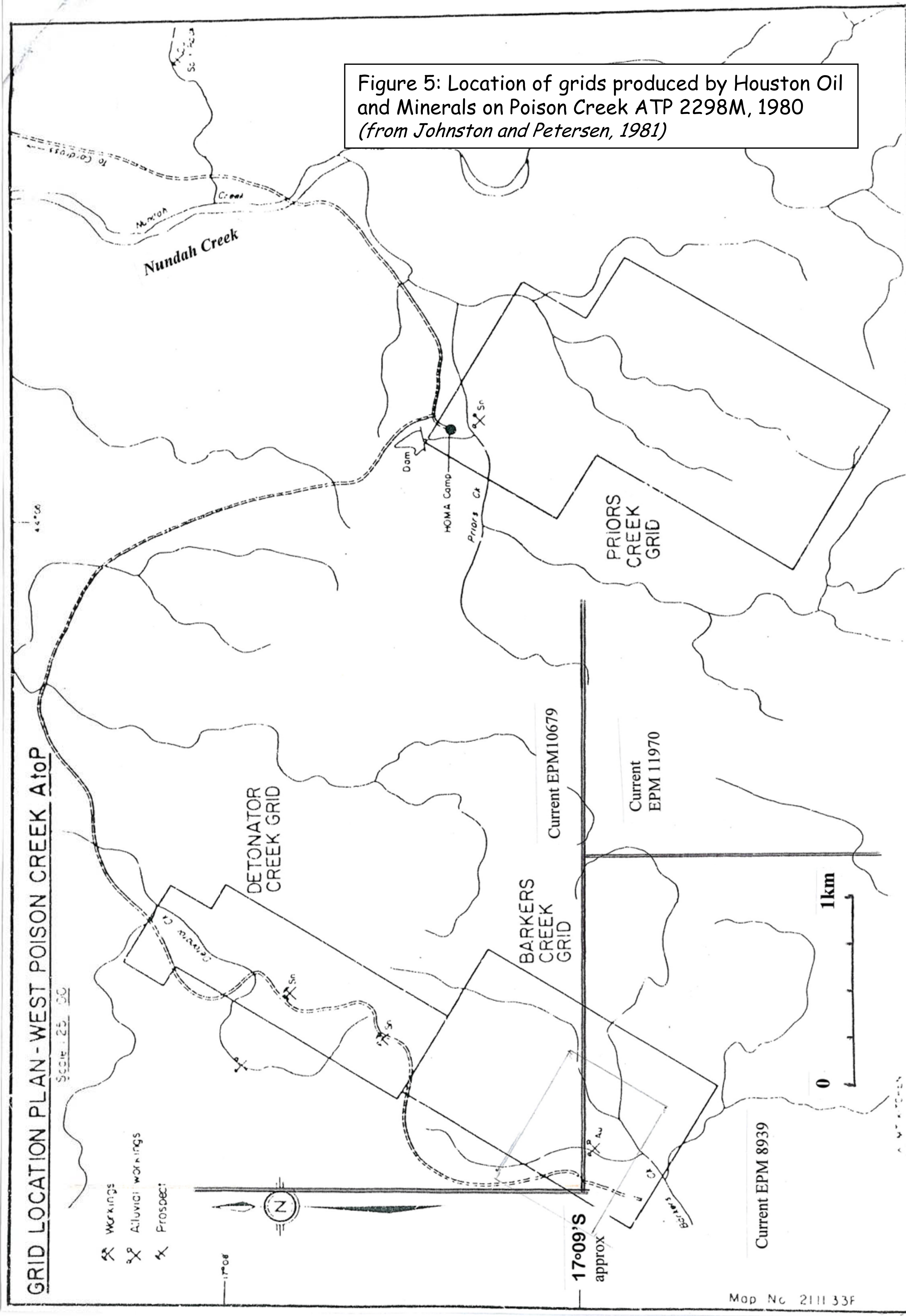


Figure 5: Location of grids produced by Houston Oil and Minerals on Poison Creek ATP 2298M, 1980
(from Johnston and Petersen, 1981)

- As correlated well with -100 mesh Au.
- Low contrast Bi anomalism correlated well with Au anomalism.

Across the Barkers Creek and Detonator Creek grids the following applied:

Analysis:	Sn, W, Mo, As by XRF; Bi by AAS	
Mesh fraction:	-40+100 for Sn, W, Mo, As, Bi	
	-100 for Au	
Horizon sampled:	Top of B – 15 to 25 cm depth	
No. of samples:	626 – Detonator grid	
	392 – Barkers Creek grid	
Background (ppm)	Sn(10), W(10), Mo(2), Bi(28), As(70)	
Threshold (ppm)	Sn(20), W(30), Mo(4), Bi(40), As(85)	
Range of peak anomalous values:	Sn	160-5900
	W	40-210
	Mo	10-20
	Bi	50-1200
	As	220-1600
	Au	Data not supplied. Au apparently was not assayed in the soil sampling. (!!!!)

The following notes apply mainly to the southern half of the Barker Creek grid (Figure 6) being most relevant to the Bunsai project (from Johnston & Petersen, 1981). HOMA located anomalous Bi(105ppm)-Au-As(405)-W(150ppm) in soils coincident with shallow trenching and old workings near grid reference 1360E 600N (see Figure 6). Their results are included with other results in a later diagram, but "selective rock-chip" samples from this area (1360E, 600N) included gold values of 5.6, 7, 68 and 91 g/t Au, with 6% W in one wolframite-bearing sample. Shallow trenching exposed stringer quartz veinlet hosting bismuth mineralisation (bismite, bismutite, bismuthinite), secondary arsenic as scorodite, and visible gold intergrown with the bismuth. Some scheelite is present in other veinlets nearby, along quartz-filled fractures and small faults and shears.

HOMA stress that the quartz vein structures are narrow and localised, but they are almost certainly the source of alluvial gold in the Barker south grid area (Figure 6).

HOMA concluded that, despite the good showings of Au, Sn etc., the presence of a gold target of, say, 20 mt @ 3 g/t Au was most unlikely

Their work, although basic, was nevertheless commendable.

4.2 **EPM8899**, 'Cardross': Final report for period ending 23 March 1993 – Newcrest Mining (P. Creenaune)

This report is included because some of the EPM 8899 impinges on the current EPM 10679 held by Queensland Epithermal Minerals (for which no reports are apparently available).

ML5194 of Joe Wood is partially included in the SW corner of the Cardross EPM 8899. Newcrest summarised previous work, and confirmed that Houston Oil & Minerals (HOMA) did not include Au assaying in their soil sampling at Barker Creek. Their stream sediment (Bulk Cyanide Leach) results plus rock chip sampling of alteration identified a broad NE-trending corridor of Au anomalism – the Cardross Corridor, which included Barker Creek at its SW extremity.

Although Newcrest intended to follow up this anomalism, they subsequently surrendered the EPM. Queensland Epithermal Minerals Ltd. was granted much of this area as EPM 10679 on 1 June 1995.

4.3 **EPM 8939**: Queensland Epithermal Minerals

This is the current EPM, consisting of 11 sub blocks; it has remained at 11 sub blocks since August 1998. Four partial relinquishment reports are available for perusal, but 11 reports from 1999 to the present remain confidential. The Department of Natural Resources and Mines will not provide a list of these confidential reports, but it is suspected that Queensland Epithermal Minerals may be in joint venture with some group or groups, and that the department has cut them some slack in the reporting.

The four published reports are a travesty of exploration and exploration reporting. Reading the reports, it is difficult to keep abreast of ownership of this EPM 8939.

It is, for example, held in the name of Queensland Epithermal Minerals Ltd. Their first report (Departmental CR 26066 Aug. 1994) was written by A.S. Marton & Associates for the registered holder Epithermal Gold Pty Ltd.

Their second relinquishment report to July 1996 (CR 29968, dated April 1998) was authored by P. Miscandlon for Arany Holdings Pty Ltd. They say that Arany acquired 100% control of EPM 8939 in 1992. (The registered holder in 1992 was Queensland Epithermal Minerals.)

Their third relinquishment report to July 1997 (CR 2970) is also dated April 1998, and was obviously written and submitted at the same time as their 1996 report CR 29968. Quite apart from the same date of submission, the text is identical, except for the surrender of one sub block in EPM 8939, reducing the holding to 11 sub blocks, which have remained in force from at least August 1998 to June 2004 without change i.e. no relinquishment.

As to the content of the relinquishment reports, the following applies:-

CR 26066 – Partial relinquishment EPM 8939 19 Aug. 1992 to 20 Oct. 1993.
Author: A.S. Marton & Associates.

Work reported:
EPM 8939 is named the "Mungana Porphyry" project. The original 48 sub blocks are relinquished by 11 sub blocks to 38 sub blocks. Most work appears to have BLEG stream sediment, rock chip and diamond/heavy mineral stream sediment sampling. Elements analysed included

analysed included	Au	-	Fire assay
	Cu, Pb. Zn, Ag, Bi, Ag	-	Acid digest
	As, Bi, Mo	-	Acid digest/AAS ICP
	Fe, Mn, Hg	-	Acid digest/AAS

Results were negative in the areas relinquished.

CR 29968	:	**Partial relinquishment EPM 8939 for period ending 22/7/96.**
Date	:	April 1998
Author	:	P. Miscandlon, Arany Holdings
Work reported	:	EP 8939 was included in a farm-in by Cyprus Gold Australia.

Other previous work described in this report included:

- Discovery in 1969 of Split Rock "Porphyry Cu" prospect about 8km ENE of Bunsai area.
- Work by HOMA 1980-82.
- Queensland Gold Resources 1987-89 conducted stream sediment sampling.
- JV with Poseidon Gold in 1992 sought firstly epithermal vein systems and secondly Leyshon & Kidston-style porphyry and breccia Au (± Cu) mineralisation. They reviewed literature and undertook further stream sediment and rock-ship assaying.

In this Company Report, Arany really did nothing except undertake yet another review of past work, which showed no potential in the areas relinquished.

CR 29970: Partial relinquishment report EPM 8939 for the Period ending 22/7/1997.
Date: - April 1998
Author: - P. Miscandlon for Arany Holdings Pty Ltd.

It is clear from the date submitted and the report content that this report is identical to the previous report CR 29968, except for details of the sub-blocks relinquished. Other than that, this report even contains the same typographic errors as the report for the previous year. It is clear that Arany had failed to submit a report for the year ended 22/7/96, and caught up, so to speak, by submitting two largely identical reports in April 1998.

My conclusion would be that no new work of any significance was conducted in the EPM in this two-year period by Arany Holdings. I would also query whether the submission of largely identical reports over 2 years is an acceptable norm of company reporting to the Mines Department.

CR 32015: Partial relinquishment report, EPM 8939 for period to 18 August 1998.
Date: - Not stated
Author: - A.S. Marton & Associates for Arany Holdings Pty Ltd
Work Reported: This very limited, sketchy report confirmed that the Arany target was "the location and testing of major hydrothermal alteration-felsic intrusive complexes that could host either porphyry-style gold and molybdenum mineralisation or associated epithermal gold mineralisation."

In the 12 months from 22/7/1997, it appears that Arany conducted "limited examination of Landsat and air photos with some ground traversing that failed to locate the large hydrothermal cells sought by the company."

They surrendered 8 sub-blocks, leaving 11 sub-blocks in the EPM.

Note that the EPM 8939 still contains 11 sub-blocks, so there has been no relinquishment of any sub-blocks since at least August 1998, a period of 6 years to August 2004.

Since August 1998, I am informed that there are also 11 company reports covering this period which remain confidential; details of these reports (numbers, dates, authorship etc.) are also confidential.

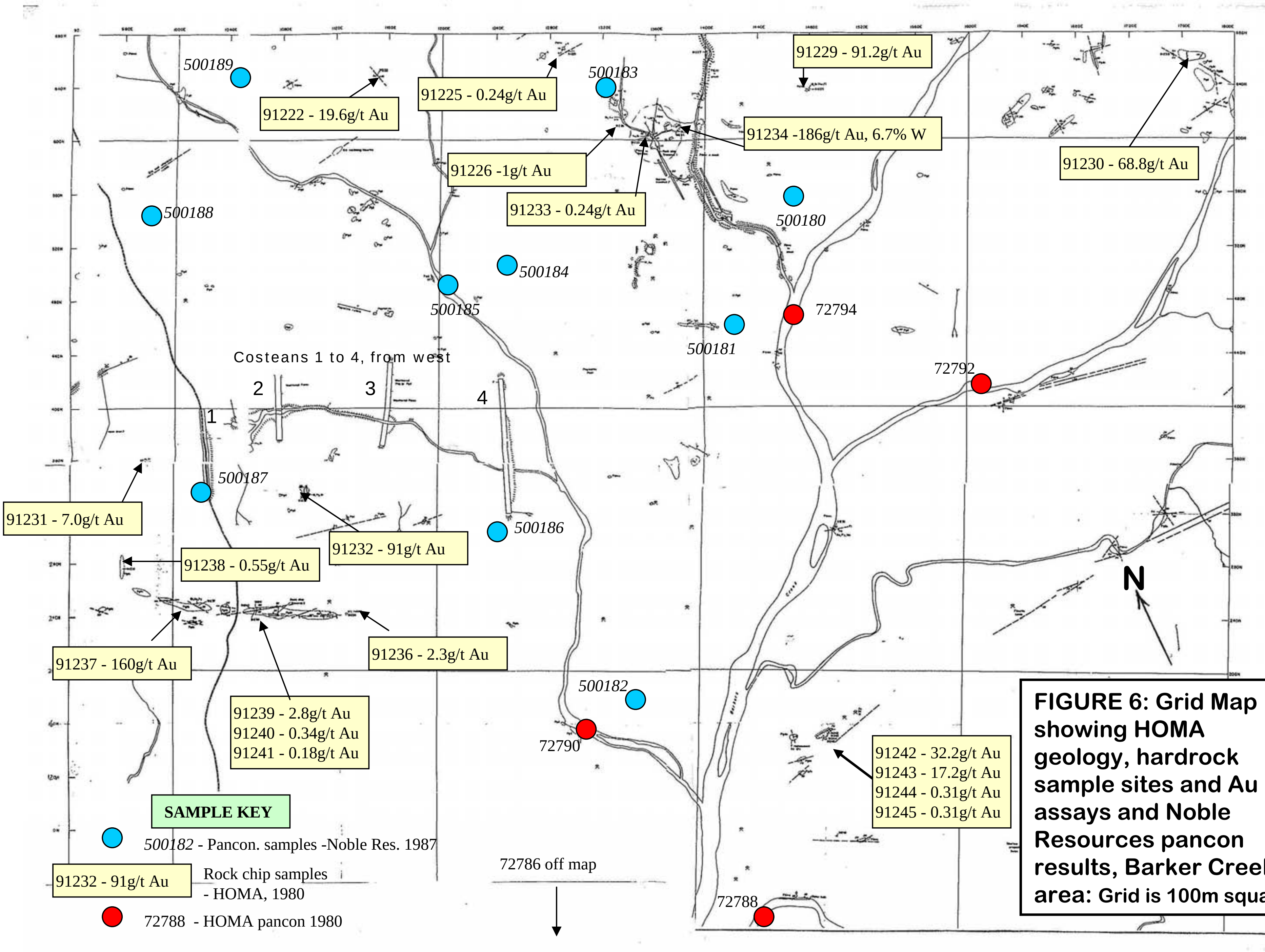


FIGURE 6: Grid Map showing HOMA geology, hardrock sample sites and Au assays and Noble Resources pancon results, Barker Creek area: Grid is 100m square

5. Work conducted on LEASE ML 5194 (J. Wood).

Mr Joe Wood is the registered lessee of ML 5194, granted 8 May 1986, with expiry due 31 May 2007. As noted earlier, he pegged the lease with the blessing of Houston Oil & Minerals, following their withdrawal from the area and following his employment with HOMA on the Poison Creek exploration team on ATP 2298M. G. Derrick and J. Wood visited the area in October 1987 on behalf of Noble Resources, when Wood highlighted some of the unique aspects of the lease area, such as the metal detecting of native bismuth nuggets to 1 cm in eluvial scrapings. This visit and some routine but limited panconcentrate sampling has since engendered my interest in the region as an alluvial/eluvial Au-Bi-Sn play.

Only Mr Wood can advise as to what work he has undertaken on his lease since 1986-87. Colour air photos dated 1996 show some scrapings and possibly a N-S cleared line, suggesting that he has undertaken some small-scale mining or testing either on his own or in joint venture with another group. Small scrapings are also evident along the WNW-trending contact between granite (to the north) and gneiss and schist (to the south).

There is no publicly available information to show if there is any link between Mr Wood and Arany Holdings/Marton & Associates/Qld Epithermal Minerals, holders of the EPMs enclosing ML 5194. I doubt if Mr Wood would deal with these groups, based on their poor reputation in the industry, but in financially tight times some deals may have emerged.

If it can be shown that Mr Wood has no connections with Arany/Marton, then he should be contacted with a view to some co-operative evaluation of the Au-Bi-Sn eluvial/alluvial potential of his lease. As will be shown later, mineralised eluvium extends beyond the ML boundaries, so acquisition of certain sub-blocks as and when they become available would also be desirable.

6. Geology, 1:100,000 Scale.

Portion of the Mungana 1:100,000 geological map is shown as Figure 7. This map was published in 2003, with an accompanying set of notes (Bultitude et al., 2002). Barker Creek “diggings” or scrapings are shown as Prospect No. 1 on this map, hosted within a leucogranite unit OSgn5. Essentially the entire Bunsai area is mapped as variants of the Ordovician-Silurian Nundah Granodiorite intruding Palaeoproterozoic Dargalong Metamorphics (symbol Pa_5) and Cardross Orthogneiss (symbol Pdg1). Just to the north of the Bunsai project unit OSgn5 is in contact with a leucognanodiorite symbol OSgn1 which tends to be more strongly outcropping than OSgn5.

The northerly granite appears to be host for many of the old alluvial Sn workings and Sn-bearing veinlets which occur within the old Detonator Creek grid of Houston Oil & Minerals (see Figure 5).

Various other subdivisions of the Nundah Granodiorite are mapped to the NE & W of Bunsai – units OSgn2 and OSgn6; the differences between these various subdivisions appear quite subtle in places.

There are no known Permo-Carboniferous intrusives in the Bunsai area, although unit Cg, is an unassigned granitic complex intruding Nundah Granodiorite about 4km NW of Bunsai, while to the SE the Barkers Creek Igneous Complex intrudes Nundah Granodiorite and Dargalong Metamorphics. Various quartz veins and rhyolite dykes are shown in the Bunsai area, of unknown age; however, they contain Au, Bi, Sn, W & Mo mineralisation, and are probably of Permo Carboniferous age.

There is no data on metal zoning or metal sources at Bunsai, although it is possible that overlapping hydrothermal systems were operative, one forming the Au-Bi quartz vein association, the other forming a Sn (±W, Mo) association (e.g. see Lang & Baker, 2001), in the upper levels and peripheral zones of buried high-level Permo-Carboniferous granitic source rocks (295-305 Ma??)

Sn mineralisation in much of the Mungana 1:100,000 sheet area is attributed to granites of the O’Brien’s Creek Supersuite e.g. McCord Granite, Flynn’s Creek Granite etc., generally highly fractionated felsic I-type granites dated as late Carboniferous, about 320 Ma (Bultitude et al., 2002).

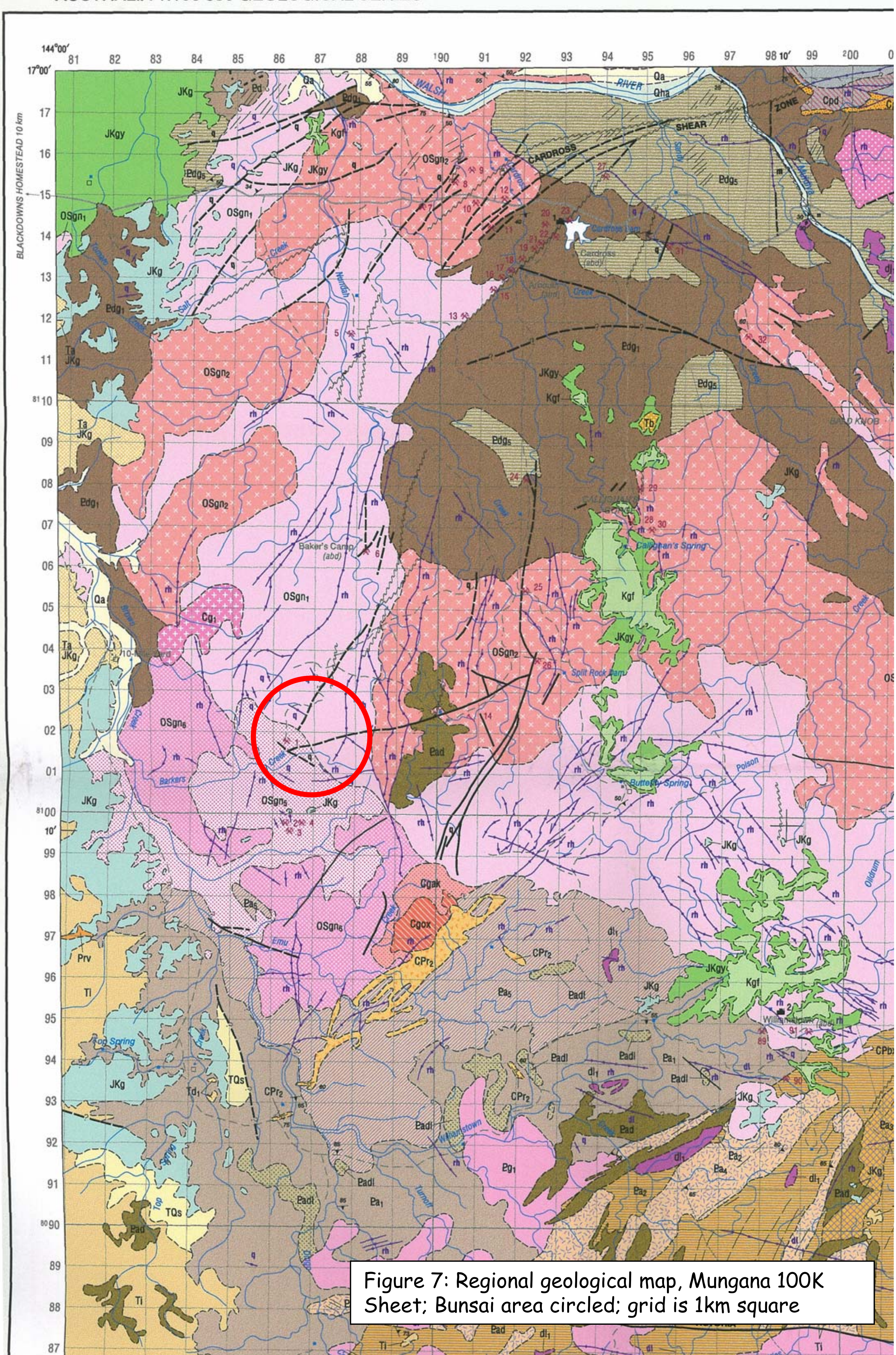


Figure 7: Regional geological map, Mungana 100K Sheet; Bunsai area circled; grid is 1km square

EARLY SILURIAN - EARLY DEVONIAN

Chillagoe Formation	SDc$_{a1}$	Pale grey to white, medium to coarse-grained, quartzose arenite, pebbly quartzose arenite, conglomerate; clasts of mainly quartz
	SDc$_{a2}$	Medium to dark grey, medium to thick-bedded, medium to coarse-grained labile arenite, conglomeratic arenite; minor mudstone, siltstone, conglomerate
	SDc$_{cg}$	Medium to dark grey, thick-bedded to massive, polymictic, pebble to boulder conglomerate; minor labile arenite, conglomeratic arenite, limestone, chert, mudstone
	SDc$_{aso}$	Medium to dark grey, thin to medium-bedded, rhythmically interbedded, labile arenite, siltstone and mudstone
	SDc$_{c}$	Pale to dark grey, black, buff, pale brown and green, thin-bedded to massive chert (locally with poorly preserved radiolarians); minor limestone, metabasalt, mudstone, shale
	SDc$_{b}$	Pale to dark green or greenish grey to dark grey, massive to locally amygdaloidal metabasalt; minor limestone, chert
	SDc$_{l}$	Pale to dark grey, mainly massive limestone (commonly fossiliferous) and limestone breccia; minor chert, metabasalt, marble, calc-silicate rocks, boulder conglomerate
	SDc$_{q}$	Medium-grained, quartzose arenite

LATE ORDOVICIAN - EARLY SILURIAN

White Springs (Blackman Gap) Supersuite

Nundah Granodiorite	OSgn$_{6}$	Pale grey, foliated, medium-grained to pegmatitic muscovite-biotite leucogranite; locally with large inclusions (to ~2 m) of gneiss
	OSgn$_{5}$	Extensively altered, medium-grained, even-grained muscovite leucogranite; commonly foliated
	OSgn$_{4}$	Pale grey, foliated, even-grained to porphyritic (locally), medium-grained to pegmatitic biotite-muscovite and muscovite-biotite granodiorite; minor rutile-bearing, white to pink, fine to medium-grained, (muscovite-) quartz-albite rock ('albitite')
	OSgn$_{3}$	Leucocratic biotite-muscovite granodiorite?; moderately to strongly magnetic; with greyish green tones on radiometric image
	OSgn$_{2}$	Pale grey to white, foliated, medium-grained to pegmatitic, even-grained to porphyritic, leucocratic biotite-muscovite granodiorite; rare tourmaline breccia
	OSgn$_{1}$	Pale grey to white, foliated and locally gneissic, medium-grained to pegmatitic, even-grained to porphyritic, leucocratic biotite-muscovite granodiorite; minor pegmatite; rare aplite; locally heterogeneous

EARLY ORDOVICIAN?

Mulgrave Formation	Om	Cream to pale green, pale grey, greenish grey to pale brown, or khaki, fine to medium-grained, moderately well to poorly sorted quartzose arenite; minor interbedded siltstone and mudstone

MESOPROTEROZOIC?

Forsayth Supersuite

Fig Tree Hill Granite Complex	Ᵽg$_{3}$	White to pale grey, extensively altered granite; secondary sericite/muscovite and quartz-hematite-sericite rock common
	Ᵽg$_{2}$	Pale grey, medium-grained to pegmatitic (biotite-) muscovite leucogranite; minor amphibolite, quartz-hematite-sericite rock, poorly exposed brown medium-grained even-grained gneissic muscovite-biotite granite
	Ᵽg$_{1}$	Pale to medium-grey, white or pale brown, medium to coarse-grained, uneven-grained to porphyritic muscovite-biotite monzogranite to granodiorite; commonly foliated (locally gneissic); minor pegmatite; (muscovite-) bioitite granite, muscovite-biotite microgranite, biotite-rich granite

PALAEOPROTEROZOIC - MESOPROTEROZOIC

Dargalong Metamorphics

Cardross Orthogneiss	Ᵽdm	Grey, foliated (mylonitic), porphyroclastic gneiss, augen gneiss, sillimanite-garnet-biotite gneiss; minor foliated amphibolite, (muscovite-) quartz mylonite, siliceous mylonite with relict feldspar porphyroclasts; rare mafic granulite, quartzite
	Ᵽdq	Quartz mylonite, muscovite-quartz mylonite
	Ᵽdu	Dark grey, medium-grained, meta-spinel lherzolite
	Ᵽdg$_{5}$	Grey, medium to coarse-grained, gneissic granite, garnet-biotite gneiss and augen gneiss; locally with inclusions (up to ~1 m) of mainly amphibolite and gneiss; commonly migmatitic; subordinate amphibolite; minor banded gneiss (paragneiss?), schist (locally with sillimanite)
	Ᵽdg$_{4}$	Grey, massive, medium to coarse-grained, biotite gneiss and orthogneiss (commonly with white K-feldspar megacrysts/augen up to ~10 cm); minor amphibolite, dark reddish brown (garnet-sillimanite) schist, glassy or pale grey quartzite
	Ᵽdg$_{3}$	Grey, massive, medium to coarse-grained, biotite gneiss, augen gneiss and gneissic granite, regularly banded, fine- to medium-grained biotite gneiss and amphibolite; minor amphibolite, migmatite, schist
	Ᵽdg$_{2}$	White, medium-grained, glassy quartzite, with a planar fabric; minor (biotite-muscovite) leucogranite, muscovite pegmatite
	Ᵽdg$_{1}$	Grey, massive, medium to coarse-grained, megacrystsic biotite gneiss, augen gneiss and gneissic granite; thinly banded, fine to medium-grained biotite gneiss; migmatite; minor amphibolite, (garnet-sillimanite) schist, quartzite
	Ᵽd	Brown to grey, fine to medium-grained quartz-muscovite schist and ferruginous schist, glassy and thin-banded quartzite, schistose muscovite quartzite, quartzofeldspathic gneiss

Unnamed Metamorphic and Meta-Granitic Rocks (Ᵽb$_{2}$ - Ᵽa$_{1}$)

Ᵽb$_{2}$	Brown to reddish brown, medium to coarse-grained biotite-muscovite and muscovite-biotite schist (locally garnetiferous); subordinate gneiss, amphibolite
Ᵽb$_{1}$	Brown to reddish brown, medium to coarse-grained (garnet-) biotite-muscovite schist, gneiss, amphibolite, migmatite
Ᵽadl	Amphibolite; commonly with well-developed foliation; locally garnet bearing
Ᵽad	Coarse-grained muscovite schist; minor amphibolite/metadolerite, gneissic biotite granite
Ᵽa$_{5}$	Reddish brown (quartz-biotite-) muscovite schist and medium-grained garnet-biotite gneiss
Ᵽa$_{4}$	Foliated to gneissic biotite leucogranite and granitic gneiss; commonly migmatitic, garnetiferous; with numerous enclaves of metamorphic rocks; minor pegmatite

Figure 7A: Reference to Regional geological map, Mungana 100K Sheet

EARLY PERMIAN?

Reamba Volcanics	Prv	*Dark grey, welded, moderately lithics-poor to lithics-free, crystal-rich, pyroxene-bearing rhyolitic to rhyodacitic? ignimbrite; minor rhyolitic lithic-crystal tuff*

LATE CARBONIFEROUS - PERMIAN

	CPbx	*Grey, greenish to brownish grey, or dark brown, hydrothermal breccia; generally extensively altered; commonly associated with dykes and small stocks of late Palaeozoic igneous rocks; locally cut by thin quartz veins*
	dl_2	*Dolerite?; characterised by dark red tones on radiometric images; interpreted from aerial photographs and geophysical images*
	dl_1	*Dark grey, fine to medium-grained dolerite; locally with chilled margins; minor gabbro?, andesite?, microdiorite; mainly interpreted from aerial photographs and geophysical images*
	CPr_2	*Pale brown to brown, pale to dark grey, or pale green, aphyric to porphyritic rhyolite, rhyodacite?, microgranite; locally garnet bearing; commonly flow-banded, altered*
	CPr_1	*Buff, pale grey, white, pale brown or reddish brown, porphyritic, intrusive rhyolite, microgranite; generally slightly to moderately altered*

LATE CARBONIFEROUS

		Unassigned
	Cg_2	*Granite?; characterised by pink tones on radiometric image*
	Cg_1	*Grey, fine to coarse-grained, porphyritic to even-grained (locally) hornblende-biotite and biotite granite; locally brecciated; commonly altered; minor diorite, biotite-hornblende granodiorite, pink biotite granite, aplite, hornblende gabbro*
		Ootann Supersuite?
	Cgl	*White, buff, pale brown, or pink, fine to medium-grained, even-grained to porphyritic, leucocratic biotite granite; minor aplite; miarolitic cavities present locally*
Nested Rhyolite Porphyry	Cgone	*White, buff, brown or pink, aphanitic to fine-grained, variably porphyritic intrusive rhyolite, microgranite; miarolitic; extensively altered*
		Ootann Supersuite Crystal Brook Volcanic Neck (Cgg)
	Cgg	*Pink to cream, leucocratic, medium-grained, even-grained to moderately porphyritic biotite granite; locally granophyric, extensively altered*
Sentinel Range Igneous Complex	Cgon	*White to pale grey or pale pink, fine-grained, leucocratic, porphyritic,(allanite-titanite-hornblende-) biotite granite; subordinate magnetite-hornblende-bearing quartz diorite (Almaden Supersuite?); minor aplite, pegmatite, granodiorite; net-veining with diorite common in places; heterogeneous unit*
Bungabilly Granite	Cgou	*Pale pink, medium to coarse-grained, even-grained to slightly porphyritic, leucocratic (hornblende-) biotite monzogranite; with sparse mafic enclaves to 5 cm; minor aplite, microgranite, microgranodiorite, diorite*
Carrs Granite	$Cgoc_2$	*Grey, pinkish grey or pale pink (altered) hornblende-biotite monzogranite; with prominent highly magnetic (hornfelsed?) rim and pale pinkish white tones on radiometric image*
	$Cgoc_1$	*Grey, pinkish grey or pale pink (altered), fine to medium-grained, slightly to moderately porphyritic, (allanite-titanite-) hornblende-biotite monzogranite; with scattered mafic enclaves to ~1 m*
Barkers Creek Igneous Complex	Cgox	*White to pale grey, fine-grained, slightly to moderately porphyritic, (hornblende-) biotite monzogranite; with sparse mafic enclaves to ~10 cm*
		Almaden Supersuite (Cgag - Cgaw)
Long Gully Granite	Cgag	*Pale grey to pale pink, medium-grained, slightly to moderately porphyritic (allanite-titanite-) hornblende-biotite monzogranite; with mafic enclaves to ~30 cm; minor diorite*
Ruddygore Granodiorite	$Cgar_4$	*Pale grey, medium-grained, moderately porphyritic (allanite-) hornblende-biotite granodiorite; with scattered mafic enclaves to ~10 cm*
	$Cgar_2$	*Medium grey, medium-grained, uneven-grained to slightly porphyritic hornblende-biotite granodiorite; with numerous mafic enclaves up to ~30 cm across in marginal zones; minor porphyritic hornblende-augite-biotite tonalite or quartz diorite*
	$Cgar_1$	*Pale to medium grey or pale pinkish grey, medium to coarse-grained, porphyritic, (pyroxene-) hornblende-biotite granodiorite and biotite-hornblende granodiorite to tonalite?; with sparse mafic enclaves to ~6 cm; minor titanite-diopside 'granodiorite' (endoskarn); miarolitic cavities present locally*
	$Cgar_3$	*Granodiorite; with highly jointed magnetic pattern and pistachio green and mottled red tones on radiometric image*
Belgravia Granodiorite	$Cgab_2$	*Pale grey, medium-grained, porphyritic hornblende-biotite and biotite-hornblende granodiorite; with scattered mafic enclaves ~15 cm*
	$Cgab_1$	*Grey, fine to medium-grained, porphyritic (augite-) biotite-hornblende granodiorite and hornblende-biotite granodiorite; forms net-veined complexes with gabbro and dolerite locally; minor diorite*
		Crystal Brook Volcanic Neck (Cgb - Cgm)
	Cgb	*Grey, fine-grained, slightly porphyritic augite-biotite-hornblende quartz diorite; locally amygdaloidal; breccia common in marginal zones*
	Cgm	*Grey, medium-grained, even-grained to slightly porphyritic, pyroxene-biotite-hornblende granodiorite or quartz monzodiorite*
Barkers Creek Igneous Complex	Cgak	*Pale to medium-grey, fine-grained, even-grained to porphyritic (pyroxene-) biotite-hornblende granodiorite to pyroxene gabbro or quartz gabbro; minor aplite, aplitic microgranite, (hornblende-) biotite granite (Ootann Supersuite)*
Mount Wandoo Granodiorite	Cgaw	*Medium to dark grey, fine to medium-grained, porphyritic, (titanite-) biotite-hornblende granodiorite-diorite?; with numerous mafic enclaves to ~15 cm and larger inclusions of country rocks*

Figure 7B: Reference to Regional geological map, Mungana 100K Sheet

7. Sampling Results, Bunsai Project

The following sampling results are the heart and soul of the Bunsai project. They represent panconcentrate samples taken by various workers at various times and generally in support of both hard-rock and eluvial exploration targets. The most recent sampling (in 1987-1988) was solely directed at initial testing of eluvial potential.

All these sampling campaigns were ad hoc and quite limited in their extent; the only follow-up that could be expected from, say, the 1987-1988 sampling would have been by Mr Joe Wood on his lease ML 5194.

Let us see where the old sampling results take us; it is stressed again that the assay results are for panconcentrate samples, and that some recalculation of grade back to g/m^3 is imprecise, and should be used only as a guide, not gospel. Much of this current reporting is based on the field observation that significant colour of heavy mineral (Sn-Bi-Au) concentrate was recovered easily from most samples. At the time there was little attention paid to accurate measurement of panning dish volume, weight of sample etc. However, this report includes not only the laboratory assay results, but also the observations and terminology used by prospectors in the practice of their craft – presence of pin heads, pin pricks etc to describe gold occurrence in the dish, and estimates of grade from these practical observations as well as laboratory assay. Comparison of field estimates and laboratory assays make for interesting reading (see Table 9).

All sample locations are plotted on Figure 8, an enlargement of the 1979-80 colour photography; most locations are also plotted on the old southern grid of the HOMA geological map (see Figure 6).

Group 1: Houston Oil and Minerals; 1980-81
Poison Creek ATP; heavy mineral concentrates

Table 1: Pancon assays for Group 1 samples, Poison Creek ATP, 1980-81

Sample No.	Wt g	Nb ppm	Ta	W	Sn ppm, %	g/m^3	Au g	Au mg/m^3 **	g/m^3
72784*	61.6	21	-5	217	1.22%	75	20.1	124	0.124
72786	72.5	145	71	1000	5.55%	402	23.1	167.5	0.167
72788	68	128	35	724	4000	27	29.4	200	0.2
72790	83	37	173	1410	4600	38	88.5	736	0.73
72792	52.3	50	37	1360	9300	48.7	10.2	53.4	0.053
72794	65.25	45	66	1910	3.8%	248	20.8	135.7	0.13
Bedrock; granite, schist, porphyry, some rhyolite; fluorite in 790 and 786									

* In Detonator Grid north-flowing drainage
** 1000 mg/m^3 = 1g/m^3; Nb, Ta, W, Au assays in ppm

Comments

Lovett (1981) reports that this panconcentrate sampling in the Barker Creek area was to follow-up Au-Sn-W anomalism located in an earlier stream sediment survey. "At each site a suitable trap was selected and a 10 litre sample collected and panned to about 200 gms; concentrates were assayed for Sn, W, Au, Ta and Nb, a grade calculated given the volume of the original sample and the weight and grade of the concentrate." The formula for such calculation is as follows:

AG = Alluvial grade (g/m^3)
CW = Concentrate weight
Au = Au assay (ppm)
SV = Sample volume (litres)

$$AG = \frac{(CW \times Au)}{1 \times 10^3} / SV \times \text{No. of dishes to equal } 1m^3 \text{ (loose)}$$

Five (786 to 794) of the six samples are plotted (yellow balls) in Figure 8. All show Sn-Au anomalism, and all could be expected to show a significant colour in the dish. Two samples (792, 794) are within the lease and proximal to presumed hard-rock tin sources, but significant results from Sample 786 (distal to the lease) show that Sn and Au-bearing veins may be distributed regularly throughout the lease and adjacent areas. There are no results for bismuth in this group.

Group 2:

This group of samples were submitted for assay on 23/7/87, with results received (from Analabs) on 27/8/87. Location is shown on Figure 8. The samples comprise some rock chip and 2 panconcentrate samples, of which only the latter are of direct relevance to this report (502022. 502023). Results are listed in Table 2.

Table 2: Assay results for rock chip and pancon (2) samples, lease and EPM area

Number	Au_1	Au_2	W	Sn	Bi	Notes
502018	0.135					Vugghy qtz vein in metamorphics – rc
502019	<.005					Cellular qtz vein + fluorite – rc
502020	5.73	3.72	372	1.21%		Greisen + clay-sericite alteration – rc
502021	1.42		<10	14		Qtz vein and asp + W; Rockchip – rc
502022	1.78g/m^3				8.3% 232g/m^3	Panconcentrate
502023	1.94g/m^3				8.3% 422g/m^3	Panconcentrate

The four rock chip (rc) samples are of little relevance to the Bunsai project, except to indicate that some Au-Sn anomalism (020, 021) probably derived from narrow veins, exists to the NNE of the NE corner of ML 5194. Samples 018 and 019 are from the walls of costean 3 (as numbered from the west) within ML 5194.

Panconcentrate samples 022 and 023 are from the lease area, within a small drainage just to the south of the costean. They both contained visible Au and some visible native bismuth and were submitted to Analabs for detailed analysis.

In view of the small weights of the samples, and their relative coarseness, Analabs decided to hand-pick the free gold, weigh and assay it, then fire assay the residue for locked Au and Bi. Their results are as follows:

1. **Hand-picked gold**
   502022 wt .0.010806g Au content 0.009137 g
   502023 wt. 0.008404g Au content 0.007375 g

2. Locked gold

502022	wt. 19.46g	Au content 0.00306g
502023	wt. 34.87g	Au content 0.00593g

Combining these figures,

52022	wt. of gold in head sample = 0.012197g in 19.471g
52023	wt. of gold in head sample = 0.013305g in 34.878g

Since these weights came from the equivalent of one large dish, the recalculated grades per m^3 are as follows: (146 dishes to $1m^3$)

52022	Au 0.012197 x 146 = ***1.78 g/m³***
52023	Au 0.013305 x 146 **= *1.94 g/m³***

Bismuth assays completed on gold residues after hand-picking were 8.2% and 8.3% respectively. From sample weights of 19.47g and 34.87g, these equate to grades of 232 and 422 g/m^3 Bi respectively.

Comments on Group 2 results

The two panconcentrate samples 502022 and 502023 are of most interest, and indicate the presence of Au-Bi bearing veins in the vicinity of the sample site, which is located in the western half of ML 5194. The Au-Bi anomalism also indicates potential for further Au-Bi anomalism in alluvium and eluvium to the west and northwest, in the headwaters of this particular SE-flowing drainage.

Group 3 Samples

All these 10 samples are panconcentrates taken from various sites on ML 5194; sampling was undertaken by J. Wood and G. Derrick in October 1987, for Noble Resources, and while not systematic, the sampling took place along 3 broad-spaced lines 100 to 150m apart oriented NNE-SSW across the lease – basically a grid of 3 samples x 3 samples. One sample (185) is a panconcentrate from a stream bed, while the remainder are from eluvial environments. There are no details available of the sample sites other than their location and type, although some are from areas of very shallow eluvium (20cm or so thick) to zones of eluvium at least 2-3m thick. In the latter case, no attempt was made to sample at the eluvium-bedrock contact. Regardless of the depth of eluvium (which remains largely unknown and untested), most or all of the eluvial samples were taken from the top half-metre of the eluvial profile.

Locations of the Group 3 ‘on-lease’ samples are shown in Figure 8. Raw assay results are listed in Table 3 overleaf.

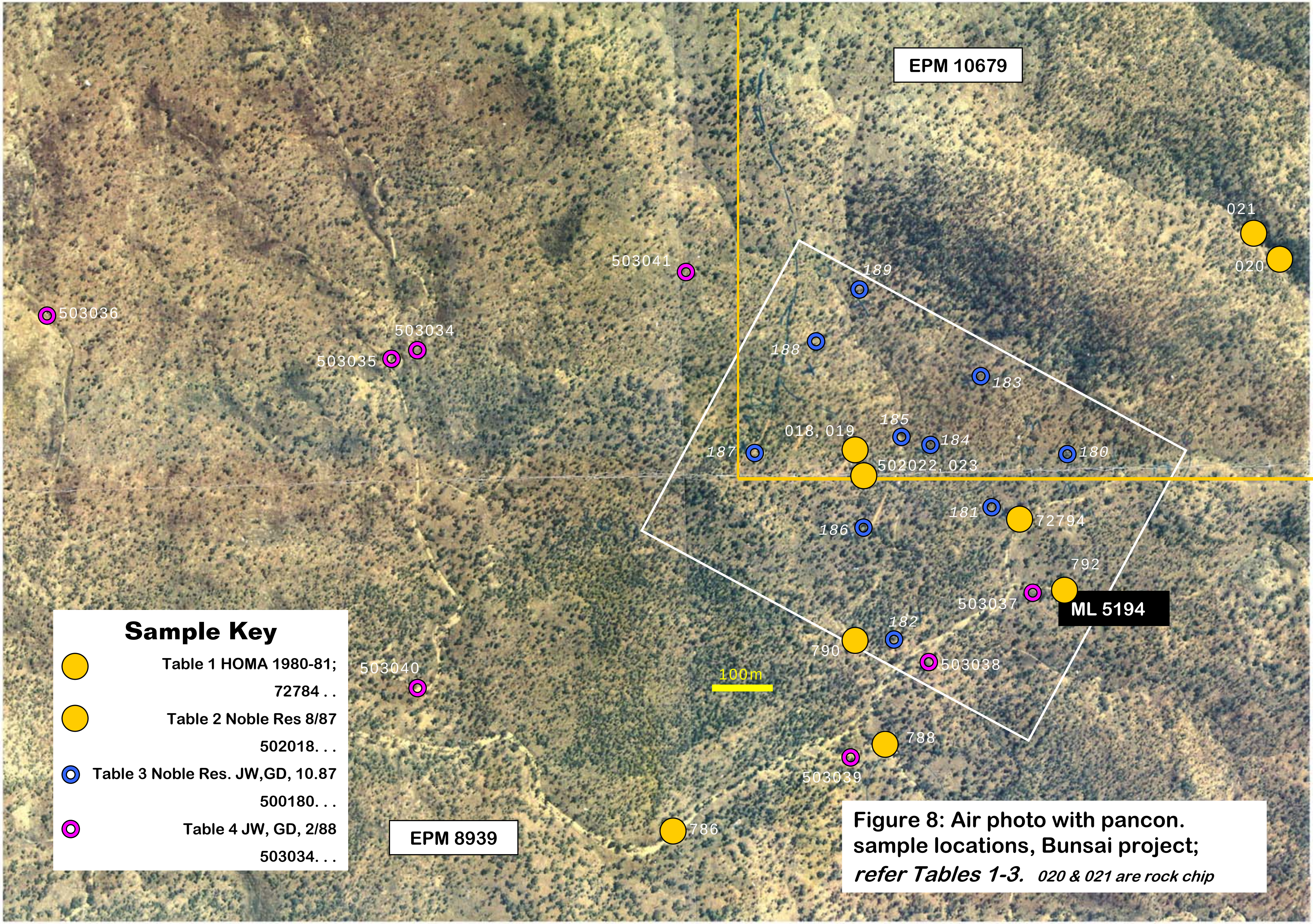


Figure 8: Air photo with pancon. sample locations, Bunsai project; *refer Tables 1-3.* *020 & 021 are rock chip*

Table 3: Assay results, Bunsai Project, On-lease Group 3 samples, Oct. 1987

Sample No.	Sample Type	Au ppm PM209	Au g/m^3	Sn ppm XRF1	Sn g/m^3	Bi ppm XRF1	Bi g/m^3	S.Wt Grams
500180	0.3m thick eluvium above bleached graphic granite	24.3	0.039	270	0.46	7.21%	117.8	11.18
500181	Loam, gravelly loam	1.46	0.002	1850	3.2	6650	10.94	11.26
500182	Consolidated sandy loam	680	0.87	1.11%	14.3	2800	3.6	8.82
500183	Gravelly eluvium	88.8	0.13	190	0.28	5.60%	84	10.26
500184	Surficial cobbly gravel, sandy gravel	31.7	0.036	1400	1.6	3.97%	45.6	7.86
500185	Stream sediment	2240	1.6	3.95%	28.47	19.1%	137.6	4.93
500186	Loamy soil	70.9	0.14	1450	2.99	8050	16.6	14.13
500187	Gravelly soil above bed rock	19.9	0.018	140	0.13	36.8%	344.8	6.41
500188	Gravelly loam	14.9	.004	210	0.06	3.89%	11.99	2.11
500189	Gravelly loam	9.92	.008	200	0.16	9000	7.48	5.69
Detection Limits		0.01		5		4		

Note: Sample volume 1 large dish; 146 dishes to 1m^3. Assays by Aust. Lab. Services, 17.11.87.

These Group 3 on-lease panconcentrate assay results are repeated and recalculated to actual grades in Table 4. One part of Table 4 presents "estimated" grades by sampler Joe Wood – his estimates *are* ***"for all visible gold which would be recoverable in an alluvial plant. The largest piece of gold was approximately one and half times the size of a pinhead. A big percentage (say about 50%) would be finer than table salt; the rest is salt size to sugar grain size."*** (See also Figure 11)

Table 4: Recalculated grades (g/m^3) for panconcentrate samples from ML 5194

$$\text{(grade/m}^3 = \frac{\text{ppm x sample wt. x No. of dishes to 1m}^3\text{ [146]}}{1 \times 10^6}\text{)}$$

Sample no. Group 3 pancons.	Au g/m^3 J. Wood estimate	Au g/m^3	Sn g/m^3	Bi g/m^3
500180	**0.348**	0.039	0.46	117.8
500181	**0.158**	0.002	3.2	10.94
500182	**1.7**	0.87	14.3	3.6
500183	**1.9**	0.13	0.28	84
500184	**0.635**	0.036	1.6	45.6
500185	**3.8**	1.6	28.47	137.6
500186	**1.75**	0.14	2.99	16.6
500187	**0.032**	0.018	0.13	344.8
500188	**0.095**	0.004	0.06	11.99
500189	**0.19**	0.008	0.16	7.48

Comments on Group 3 (on-lease) results:

All samples are of eluvium, except sample 500185, which was stream bed sample; this sample also contained the highest assays for all elements analysed – an impressive 19.1% Bi, 3.95% Sn and 2240ppm Au in the panconcentrate, reflecting the efficacy of stream sediment processes in the sampling and concentration process.

Sample 500180, from the very shallow eluvial workings in the NE corner of the lease, contained nuggets of native bismuth found by Joe Wood using a metal detector. These nuggets are virtually indistinguishable to the eye from ironstone gravel and pebbles, but have a very high specific gravity and reveal metallic bismuth when broken open. Figures 9A and 9B illustrate the size and internal nature of the nuggets, which also contain intergrowths of visible gold with the bismuth.

These coarse nuggets would be proximal to source, and given the very high assays from eluvial samples 180, 183 and stream sediment sample 185, one could presume that Au-Bi is being sourced from a series of narrow E-W to WNW-trending mineralised quartz veins in the lease and adjoining areas. Some veins specifically may occur along the boundary between upstanding granite and recessive granite and schist occurring near the northern boundary of the lease. Gold grades in this area are shown in Figure 6, and include Au grades of 68.8, 186, 91 and 19.6g/t Au in rock chip sampling. It is notable that the native bismuth is also intergrown with some gold.

Appendix 1 is a petrographic report by Ian Pontifex dated 14.8.87, describing the nuggets featured in Figure 9A,B. Pontifex observed several small (0.3 x 0.8mm) slugs of gold protruding from the native bismuth, and also partly enclosed in the weathered rind on the nuggets. The metallic nuggets are identified as native bismuth, with rare ovoid inclusions of bismuthinite. The weathered rind is greyish to apple green (see Figure 9) to brownish and limonite-stained, and is identified as mostly bismutite ($Bi_2O_2CO_3$) with minor selenite (y-Bi_2O_3).

The Sn recorded in the assays for Tables 3 and 4 is probably derived from sources separate to the Au±Bi bearing veins. The coarse granite body to the north of the lease area is a likely host to vein-style and disseminated cassiterite mineralisation, given that extensive old tin workings are present a few km. north of Bunsai, in the Detonator Creek drainage draining to the north and northwest.

Table 4 bears witness to the eternal optimism of prospectors; the recalculated gold grades are significantly lower than the estimates of prospector Joe Wood, yet three of four samples (182, 183, 185, 186) can be considered as having encouraging eluvial grades. It would be premature to dismiss Wood's estimates (exaggerated as they appear to be), derived as they are from an experienced, reliable and trustworthy person. G.Derrick assisted with the panning and sampling process, and there is no doubt that in all samples the heavy mineral split was panned quickly and easily. Despite the inconsistencies in the official and estimated gold grades, the presence of easily recoverable Au and Bi in the concentrate with the gold can only add some value to the potential alluvial/eluvial product.

Final judgement should only be made after more rigorous sampling and testing in this area.

Group 4 samples:

A program of eluvial panconcentrate sampling was undertaken in late 1987 by J. Wood and G.Derrick in areas west and northwest of the lease, on behalf of Noble Resources. This small and ad hoc program was undertaken to provide some evidence, or otherwise, of the presence of an Au-Sn-Bi concentrate on parts of the adjoining EPM 8039, similar to that found on ML5194.

Sample numbers of this Group 4 are listed in Table 5, and located in Figure 8.

Table 5: Group 4 Samples, Bunsai Prospect, Western zone on EPM

Pancon Sample Number	Description of sample locality, float and outcrop	Observed Au in pancon (pp=pinpricks; ph=pinhead)	Au g/m^3	Other Pancon. Product
503034	Quartz, granite, rhyolite, greisen in gully, 0.3m deep	20 pp	0.11	Sn, sapphire
503035	Quartz, granite, pegmatite, rhyolite, vuggy quartz with Fe staining, in gully wash 0.8m deep	22pp 5½ ph	0.26	Sn, Bi
503036	Quartz, vuggy quartz, granite, porphyry, 0.3m deep in gully	6pp 2 ph	.04	Sn
503037	Granite, greisen, pegmatite, quartz, in gully 0.5m deep, 20m wide	9pp 2½ ph	0.26	Sn
503038	Quartz, greisen, granite, rhyolite, pegmatite, in gully 0.8m deep, 20m wide.	1pp	0.01	Sn, Bi
503039	Quartz, greisenised granite, pegmatite, 0.5m deep in gully 20m wide.	4pp 1½ ph	0.03	Sn
503040	Dump sample form shallow scratchings; quartz vein in greisen, some wolfram evident.	4pp	.008	W, Bi
503041	Quartz, granite, pegmatite, greisen in gully 0.4m deep, 5m wide.	1½ ph	.004	Sn, Bi

Note: 1. All samples collected 8.1.88
2. Pinheads coarser than pinpricks, as observed by J. Wood

Analytical results from ALS are listed in Table 6, and include assay results for the crushed pancon sample, plus recalculated grades as gm per m^3, using the formula:

$$g/m^3 = \frac{\text{Wt. x Assay}}{1 \times 10^6} \times \text{No. of dishes to equal } 1m^3 \text{ (146 approx)}$$

It is assumed that each panconcentrate sample came from 'one large dish', but this cannot be verified.

Table 6: Panconcentrate Assay Results, Bunsai Prospect, Western extension (2/88)

Sample no.	Sample wt (g)	Au ppm	Au g/m^3	Sn ppm or % XRF1	Sn g/m^3	Bi ppm or % XRF1	Bi g/m^3
503034	15.8	48.7	0.11	495	1.14	7700	17.7
503035	3.75	476	0.26	7700	4.2	1750	0.95
503036	3.55	80	0.04	7400	3.8	600	0.31
503037	3.24	562	0.26	4.37%	20.6	8400	3.97
503038	5.7	14.4	0.01	360	0.29	2150	1.78
503039	23.6	8.94	0.03	9450	32.5	3150	10.8
503040	16.9	3.4	0.008	1050	2.5	1.26%	31
503041	4.76	6.19	0.004	1.84%	12.78	5.16%	35.8
Detection limits ppm		0.01		5		4	

Comments on Group 4 Samples and other sample sets.

This group, like all others, shows significant anomalism in three metals – Au, Sn & Bi, and extends the strike length of anomalous eluvium to over 1km east to west (i.e. from sample 500180 to sample 503036, Figure 8). This group 4 confirms that in general the style and metal association extends away from the lease area into the adjoining EPM to the west. There may be anomalous areas also to the southwest of the ML5194, but these areas (see Figure 8) have not been sampled for this report.

While some of the richest eluvial samples and coarsest nuggets of native Bi come from the northern half of ML 5194 (e.g. sample 180, 183, 184, 185 and 188), the erratic and adhoc sampling undertaken does not define any persistent or consistent trend. Indeed, Figure 6 shows that some of the narrow high grade Au ($\pm$ Bi) bearing quartz veins are present in the south of the lease area, hence, suggesting that grades in local eluvium will be inconsistent because of the variable hard-rock source areas. There need not be a continuum of grades from high values to low values paralleling proximal to distal sampling from veins, when multiple Au-Bi vein sets may be present in the district.

Prospector's Wisdom

Table 5 describes Group 4 samples, and the amount of observable pannable gold in the dish, expressed by terms such as "pinheads" and "pinpricks". We have seen in Table 4 that prospector estimates of assay grade in g/m^3 may be too generous. In the Group 4 samples shown in Table 5, the observations of gold in the dish generally agree with assays, i.e. the highest observable gold equates to highest calculated grade (g/m^3) e.g. sample 503034, while the lowest observable gold sample 503041 also shows the lowest calculated g/m^3 grade. While this may be of some practical interest, sentiment and estimation are no real substitute for rigorous and systematic sampling to determine final economic viability.

There may be some reasons for placing a little more weight on the prospector's estimates in this case, if only because of the vast experience of Mr Wood and his general probity in these matters. Further rigorous and systematic sampling still remains as the preferred follow-up to this data.

8. Economic Considerations

The raison d'etre for compiling these notes was to present a few geological observations and assay results for a slightly unusual combination of metals (Au, Sn, Bi) contained in shallow eluvium and alluvium, and which appeared to be readily recoverable in the dish as coarse concentrate, and which may with further work be of some economic and mining interest.

Previous sampling, as outlined in previous sections, is quite ad hoc and non-systematic. Further, this Bunsai project extends over ground not owned by the author, and those that do have tenements over the areas discussed **may already have assessed or treated or mined some of the material described herein.** To therefore talk of "economic potential" is presumptuous and premature, so the following discussion is presented as a guide only to further action. The information gathered in the following tables includes current metal price estimates and in-ground value estimates for various sample localities and groupings. As a guide, (Adrian Day, pers. comm.), raw values of A$10/$m^3$ would be of interest in determination of economic potential.

Figure 10 shows an idealised layout for an alluvial or eluvial operation using a mobile plant – in this case for deep leads at the Ardlethan Tin Mine, NSW (Minfo, 2001).

Possible volumes of material

With little knowledge of bedrock topography at Bunsai, estimates of volume of eluvium and alluvium are extremely approximate. In the area shown in Figure 8, which includes ML5194 and adjoining EPM 8939, the following estimates are given:

Area m^2	***Depth m***	***Volume m^3***
1500x700m	1m	1,050,000
1500 x 700	2m	2,100,000
1500 x 700	3m	3,150,000

This takes no account of existing outcrop, which would reduce these estimates. On the other hand, areas of eluvium may exceed 3m thickness in a number of places.

Table 7 lists current metal values used in subsequent calculations. Table 8 lists an estimated grade in g/m3 for all samples, although not all samples contain all three metals Au, Sn and Bi.

Table 7: Metal prices and Conversion to Value/gm (as at 10.02.06)

Commodity	**Price $US**	**Price $A**	**A$/oz 31g = 1oz**	**A$/gm**
Gold Au	$545/oz	$726/oz	$726	$23.4
Tin Sn	$7,700/t	$10,087/t ($10.08/kg)	$0.28	0.9cents
Bismuth Bi	$5/lb	$6.65/lb	$0.41	1.32 cents

Notes: $A to US$ 0.76

Table 8: Summary of eluvial/alluvial metal grades and possible in-ground value

Sample Group	Au g/m³	Au value $ @ $23.40/gm	Sn g/m³	Sn value @ 0.9c/gm	Bi g/m³	Bi value @ 1.32c/gm	Total value A$/m³
Group 1 HOMA 1980-81 *(see Table 1)*					NO DATA		
72784	0.124	$2.90	75	$0.67			$3.57
72786	0.167	$3.90	402	$3.61			$7.51
72788	0.2	$4.68	27	$0.24			$4.92
72790	0.73	$17.08	38	$0.34			$17.42
72792	0.053	$1.24	48.7	$0.43			$1.67
72794	0.13	$3.04	248	$2.23			$5.27
					Average value n = 6		**$6.72**
Group 2 Noble Res. 8/87 *(see Table 2)*							
502022	1.78	$41.65	NO DATA		232	$3.06	$44.71
502023	1.94	$45.39			422	$5.57	$50.96
					Average value n=2		**$47.83**
Group 3 Noble Res 10/87 *(Tables 3 & 4)*							
500180	0.039	$0.91	0.46.	$0.41	117.8	$1.55	$2.87
500181	0.002	$0.04	3.2	$0.02	10.94	$0.14	$0.20
500182	0.87	$20.35	14.3	$0.12	3.6	$0.04	$20.51
500183	0.13	$3.04	0.28	$0.002	.84	$1.10	$4.14
500184	0.036	$0.84	1.6	$0.01	45.6	$0.60	$1.45
500185	1.6	$37.44	28.47	$0.25	137.6	$1.81	$39.50
500186	0.14	$3.27	2.99	$0.025	16.6	$0.21	$3.50
500187	0.018	$0.42	0.13	$0.001	344.8	$4.55	$4.97
500188	0.004	$0.09	0.06	-	11.99	$0.15	$0.24
500189	0.008	$0.18	0.16	0.001	7.48	$.09	$0.27
					Average value n=10		**$7.76**
Group 4 JW, GD 2/88 *(Tables 5 & 6)*							
503034	0.11	$2.57	1.14	$0.01	17.7	$0.23	$2.81
503035	0.26	$6.08	4.2	$0.03	0.95	$0.01	$6.12
503036	0.04	$0.93	3.8	$0.03	0.31	$0.004	$1.24
503037	0.26	$6.08	20.6	$0.18	3.97	$0.05	$6.31
503038	0.01	$0.23	0.29	$0.002	1.78	$0.02	$0.25
503039	0.03	$0.70	32.5	$0.29	10.8	$0.14	$1.13
503040	0.008	$0.18	2.5	$0.002	31	$0.40	$0.58
503041	0.004	$0.09	12.78	$0.011	35.8	$0.47	$0.67
					Average value n=8		**$2.38**
					Average Value N=26		**$2.60/m³**

Discussion of Grades and Value, Table 8

Table 8 may be a bridge too far for the Bunsai project. Metal values per cubic metre calculations show most samples (n = 26) to be uneconomic based on our adopted criteria of $10/m^3 minimum value. Only a few samples are showing value above this level e.g. 5 samples valued at $17.42/m^3 , $44.71, $50.96, $20.51, and $39.50/m^3. An average value for all samples is $2.60/m3, a disappointingly low figure.

The results highlight the optimism followed by pessimism that can be generated by assays of panconcentrates, and recalculation back to actual grades per cubic metre. Despite the low averages overall, it would be premature to dismiss the project as "uneconomic", for the following reasons:-

1. with the exception of two samples, the overall collection of samples and panconcentrates has been non-systematic, lacking real precision in the weighing of samples and measuring of dish volumes. In thicker sections of eluvium, only the top part of the section was sampled.
2. The most systematic locational sampling includes Group 3 samples, which formed a rough 3 sample by 3 sample grid over ML 5194. These samples were subject to grade estimation by prospector Joe Wood, based on his experience in translating visible pancon. mixtures and tails back to grade in grams/m^3. His listing of samples and handwritten notes are shown in Figure 11, and these results are compared with the official recalculated assay results in Table 4. The letter contained in Figure 11 notes that the estimates are ***"for all visible gold which would be recoverable in alluvial plant"(***sic).

   Wood's estimates of grade and official assay results are compared in Table 9, and values per cubic metre calculated for both sets of data. The value per m^3 figures for Wood's estimates are startlingly higher than the assay results, by factors of 3 to 10.
3. For Group 3 samples on the lease, the official estimates from assays give values for 10 samples which average $7.76 per m3. Using Wood's estimated grades from his 'experience' gives an average value of $25.92/$m^3$. Despite a propensity for exaggeration by prospectors, Mr Wood is sufficiently experienced for me to give some positive weight to his findings, to the extent that the actual value of Group 3 material sampled in this report could rest somewhere between the high and low average figures of $25.92 and $7.76/$m^3$ respectively. His estimates should not be lightly dismissed.
4. Two samples from the lease included Group 2 samples 502022 and 502023 (see location map Figure 8, and Table 8); these samples were subject (by Analabs) to the most precise and rigorous treatment of all of the pancon. samples, with Au and Bi content being determined by hand picking of coarse gold for weighing and assay, plus fire assay for both Au and Bi in the residue. After recalculation, the grades in these two samples were as follows (see also Table 8) :-

	Au g/m^3	Bi g/m^3	Value $/$m^3$
502022	1.78	232	A$44.71
502023	1.94	422	A$50.96

   These very positive samples are close to Group 3 samples on the lease 500184, 500185 and 500186 (see Figure 8), which also have very positive values per cubic metre using Wood's estimates, and good to below average results using actual assay results (see Table 9). The results overall for the Group 2 samples are strongly encouraging for at least the central portion of the lease area.
5. Some values per cubic metre would be under-reported if the sample contains significant bismuth, since some high value Au will be present in the native bismuth as intergrowths. This gold would be available with light crushing of the metallic Bi concentrate.
6. An overwhelming impression gained from the ad hoc sampling and panning of 1987 is that the Bunsai project area contains a coarse, free-running and easily recoverable suite of heavy metals/minerals Au, Sn and Bi.

Table 9: Comparison of recalculated per cubic metre values using prospector's estimates and assay results of Au content (g/m3) in Group 3 samples from ML5194.

(Au/g = $23.40; Sn/g = 0.9c ; Bi/g = 1.32c)

Sample No. Group 3	**Au g/m^3 from assay**	**Au g/m^3 from J.Wood estimates**	**Au A$/m^3 from JW**	**Sn g/m^3**	**Sn value A$/m^3**	**Bi g/m^3**	**Bi value A$/m^3**	**Total A$/m^3 JWood estimate**	**Total A$/m^3 from assay**
500180	0.039	0.348	$8.14	0.46	$0.41	117.8	$1.55	***$10.10***	$2.87
500181	0.002	0.158	$3.69	3.2	$0.02	10.94	$0.14	***$3.85***	$0.20
500182	0.87	1.7	$39.78	14.3	$0.12	3.6	$0.04	***$39.94***	$20.51
500183	0.13	1.9	$44.46	0.28	$0.002	84	$1.10	***$45.56***	$4.14
500184	0.036	0.635	$14.85	1.6	$0.01	45.6	$0.60	***$15.46***	$1.45
500185	1.6	3.8	$88.90	28.47	$0.25	137.6	$1.81	***$90.96***	$39.50
500186	0.14	1.75	$40.95	2.99	$0.025	16.6	$0.21	***$41.18***	$3.50
500187	0.018	0.032	$0.74	0.13	$0.001	344.8	$4.55	***$5.29***	$4.97
500188	0.004	0.095	$2.22	0.06	-	11.99	$0.15	***$2.37***	$0.24
500189	0.008	0.19	$4.44	0.16	$0.001	7.48	$0.09	***$4.51***	$0.27
					Average values (n=10)			***$25.92***	$7.76

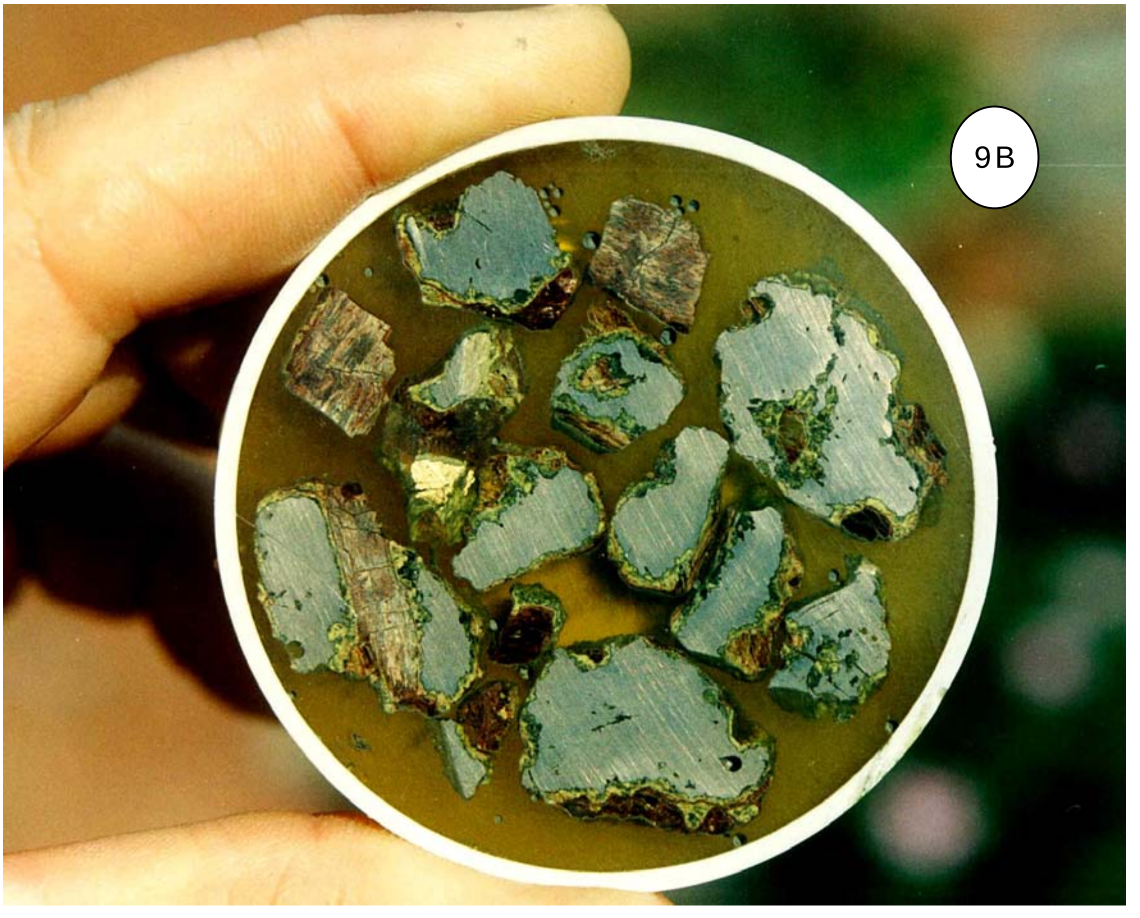
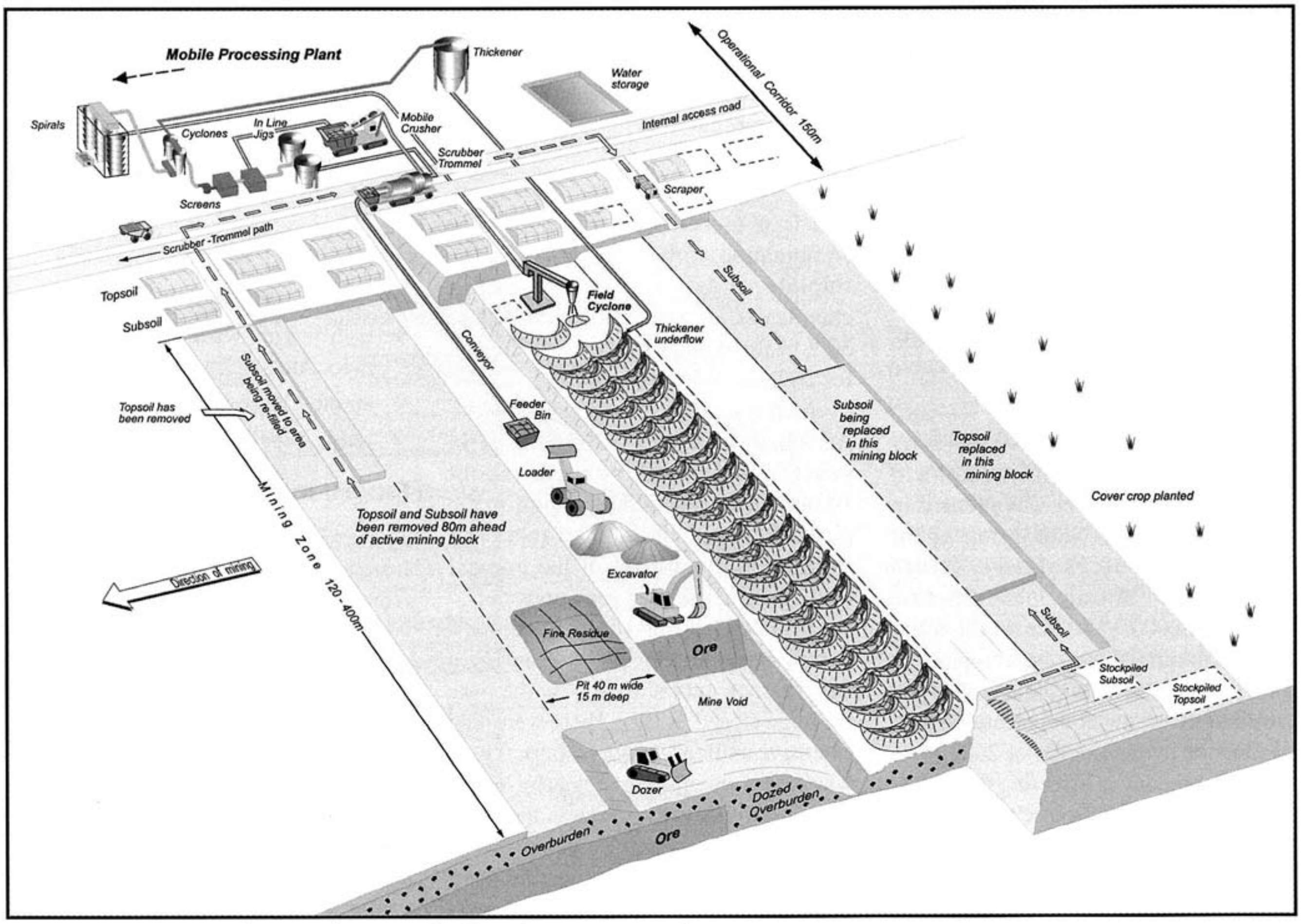


Figure 9A,B: Group of native bismuth nuggets; 9a shows natural state of nuggets recovered by metal detector from eluvium; nuggets show iron-stained exterior; 9b shows nuggets in epoxy mount slabbed for polishing and examination; note metallic nature of bismuth locally with pinkish reflection, and green oxidised rind (bismutite).



Schematic layout of proposed alluvial mining operation

Figure 10: Schematic layout of proposed alluvial tin mining operation at Ardlethan, NSW

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BARKERS CK PAN CONS ESTIMATE 28-10-87

	Au		
500180	·348 g/m³	+ Bi	
500181	·158 g/m³		+ Sn
500182	1·7 g/m³	+ Bi	+ Sn
500183	1·9 g/m³	+ Bi	+ Sn
500184	·635 g/m³	+ Bi	+ Sn
500185	3·8 g/m³	+ Bi	+ Sn
500186	1·75 g/m³	+ Bi	+ Sn
500187	·032 g/m³	+ Bi	
500188	·095 g/m³	+ Bi	
500189	·19 g/m³	+ Bi	

These estimates are for all visible gold which would be recoverable in alluvial plant. The largest piece of gold was app one & a half times the size of a pin head. a big percentage would be finer than salt.(Table) app 60%. Rest salt size to sugar grain size.

J. Wood

Figure 11: Handwritten note from prospector Joe Wood containing estimates of Au grade (g/m3) and presence of Sn and Bi in pancon. samples of Group 3, 500180 to 500189, on ML5194, Bunsai project.

9. Conclusions and Recommendation

9.1 Overlapping Palaeozoic Au-Bi and Sn magmatic provinces in the Bunsai region west of Chillagoe have been source areas for accumulation of eluvial and alluvial deposits containing gold, cassiterite and metallic native bismuth.

9.2 The Au-Bi may be derived locally from narrow quartz veins which contain some high-grade rock chip Au values, and less commonly slugs of bismuth liable to weathering and release into adjacent eluvium and alluvium.

9.3 Scattered and relatively non-systematic sampling has shown areas of up to 1.5km by 0.8km contain a free-running and relatively coarse-grained panconcentrate which may reach economic levels in places.

9.4 Assaying of panconcentrate from different times and programs has shown that from 26 samples, average values per m3 could be as low as $2.60. For a discreet sample group 3, values could be as low as $7.76 or as high as $25.92 / m3, the higher figures resulting from prospector estimates, NOT assays. While acknowledging that prospector's estimates are likely to be exaggerated and unreliable, the experience of the prospector involved is such that his estimates should not be unilaterally or unequivocally discarded.

It is therefore RECOMMENDED that:-

9.5 That an informal bush picnic be held in the Bunsai field area to ascertain just what activity has taken place on ML 5194 and surroundings since 1988, given that much of the reporting by companies in the area remains confidential.

9.6 That informal and ideally confidential enquiries be made as to the current state of ownership of ML5194 and whether owner Joe Wood currently operates in joint venture with any other individual or company (e.g. Al Marton).

9.7 That Joe Wood be contacted at some strategic point to discuss, and possibly be given, a copy of this report.

9.8 That opinions from experienced people such as John Nethery, Adrian Day and Andy White be canvassed as to whether the Bunsai project as presented here has any merit whatsoever.

9.9 That, after assessing geology and ownership questions and recent past work, a plan be drawn up to allow proper and systematic evaluation of the Au-sn-Bi eluvial/alluvial play.

This report has been a labour of love for GMD, fulfilling a need covering almost 19 years to get things out of one's head and down onto paper. The report is provided in good faith to other parties nominated above. Should any positive trends emerge from the work and ideas of others, I (G.M.Derrick) would appreciate being kept informed of and involved in any future activity.

G.M.Derrick

March 2006

10: References

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MINERALOGICAL REPORT NO. 5058

14th August 1987

TO:	Dr.G.M . Derrick Noble Resources NL PO Box 184 CORINDA QLD 4075
YOUR REFERENCE:	Order No. 0524 Qld Generative Your letter dated 8.7.87
MATERIAL: AND IDENTIFICATION:	(1) Bi-Au ore, Barker (2) Au-Pt concentrate
WORK REQUESTED:	Microscopic examination, report photography as detailed
SAMPLES & SECTIONS:	Returned to you with this report.

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1. BARKERS CREEK Bi - Au ORE

Native bismuth, enclosed in an oxidation rind of mixed bismutite, and sillenite; with sparse relicts of primary gold inclusions.

This sample was submitted as several fragments composed of a grey, shiny coarse crystalline primary bismuth mineral, enclosed in pale brownish to greenish, somewhat waxy-looking secondary phases and locally with associated gold. Three of these chips were mounted in a polished section and examined under reflected light. The enclosing secondary phases were identified by XRD. (since powdered grains mounted in oil, and examined optically, could not be identified). Also observations were made under binocular microscope.

The grey coarse crystalline primary bismuth mineral is identified optically as **native bismuth**(characterised by its creamy white colour, readily tarnishing, strong anisotropism, and parquet-feather-like twinning). Rare ovoid inclusions of bismuthinite, about 0.3mm size occur in some of the bismuth grains.

The immediately surrounding envelope is mostly 'waxy' pale-apple green, to spuriously grey, and locally limonite-stained to become brownish. This was identified as mostly bismutite [$Bi_20_2CO_3$] with minor admixed sillenite [y-Bi_20_3].

Either one of these secondary phases or mixtures of them, could represent the 'rim of grey mineral' and 'pale apple green', also the 'reddish-brown phase', all of which were mentioned in your covering notes. These secondary Bi-minerals incorporate minor iron-stained quartz as well as rimming and replacing the bismuth.

Unfortunately gold was not included in the plane of the polished section, (largely because of its very localised occurrence). However rare, very small (0.3x0.8mm) 'slugs' of gold are seen locally in several unmounted chips, protruding from bismuth and partly enclosed in the bismutite-sillenite rind. Rare smaller grains of gold occur entirely in some pieces of rind.

These studies cannot objectively confirm the genesis of the gold, but it appears that the gold occurs as original inclusions in bismuth, thus probably of the same primary origin. During alteration of the bismuth the gold remains, fortuitously, as relicts in the alteration products.