

# Old Chum Dam Anomalies in NE Context

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## Summary

The exploration of the Old Chum dam magnetic anomalies, in addition to identifying two interesting mineralised target areas for further and more detailed investigation, has both expanded on and been expanded by previous exploration over two other areas; specifically the Star Hill addit area and an older EL11/96 exploration project (MRT Open File 01-4550).

Considered in conjunction with the above other areas, the NE of the Old Chum dam target areas may reasonably be expected to favour mineralisation from a mafic source, including Cu, Ni, Cr, Co and possibly Au, while the SW target area would be expected to favour minerals from an aplite/Sn-greisen environment. However, the proximity of the two areas would imply some interaction.

In addition to the above, the exploration results have also identified a type of mineralisation and its genesis (whatever it turns out to be) that will be characteristic across at least the northern area of the Poimena pluton. Therefore the results of further exploration of the Old Chum dam anomalies, as well as proving or disproving a viable economic deposit in the Old Chum dam area, are also going to provide exploration information applicable across a wide area of northeast Tasmania.

It is therefore the recommendation of the author that further exploration of the target areas, including geochemistry, electromagnetism and drilling be considered, keeping in mind that any deposit will be at depth, probably between 150 to 500m.

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## ***Introduction***

The NE of Tasmania, east of Scottsdale and north of St Helens, is currently, I think, in a period of mining limbo. Alluvial mining for tin is pretty much at a stage of just mopping up old tailings and small known alluvial remnants. Hard-rock mining, at Mathinna (gold) and Lotta (tin) have largely reached the stage of old miner bar-room myths of forgotten lodes, hidden leads, past management mistakes and new “absolute certainties”.

The surface areas of the NE are probably now of interest mainly to small private miners, with the only miner currently left standing in the NE being one small alluvial miner.

I think there are no “quick return” near-surface larger mining projects left in the NE to develop or manage.

Yet, over the past 20 years, and largely ignored by most (not all) of the larger companies seeking to explore in the NE, knowledge and understanding of the NE Tas. geological structure and history have really leaped ahead, due to geologists such as Reed, McClenaghan, Bottrill, Everard, Groves, Richardson and Keele. A most significant factor in this development has been the recent MRT publication of magnetics, gravity and radiometric maps of the NE, which have together revealed structures previously unsuspected. MRT work on the NE is continuing with structural modelling based on gravity and magnetics and with active investigation of newly revealed anomalies such as we are currently investigating near Old Chum Dam. Interest in the NE at the Uni of Tas. (within CODES) is also being maintained, under Prof. Ross Large and Dr. Gary Davidson, with variations on exploration models such as the Tennant Creek Cu, Au, Co type (Davidson & Large, 1998) and the Northern Chile Tropezon Cu, Au, Mo deposit (Tornos et al, 2010) being considered to explain some high Co values (some of our values are higher than theirs).

The NE of Tasmania is now set up for an increase in, or perhaps a start to, a new phase of “green-fields” exploration. I think the key to this exploration is the understanding, now rapidly expanding, of the structure of the NE and its geological history, and a realisation and acceptance that any economic deposit, while leaving clues on the surface, is not going to be on the surface, and, with the exception of the Alberton/Mathinna area, is not going to be the “normal” tin or gold deposit previously mined in the area.

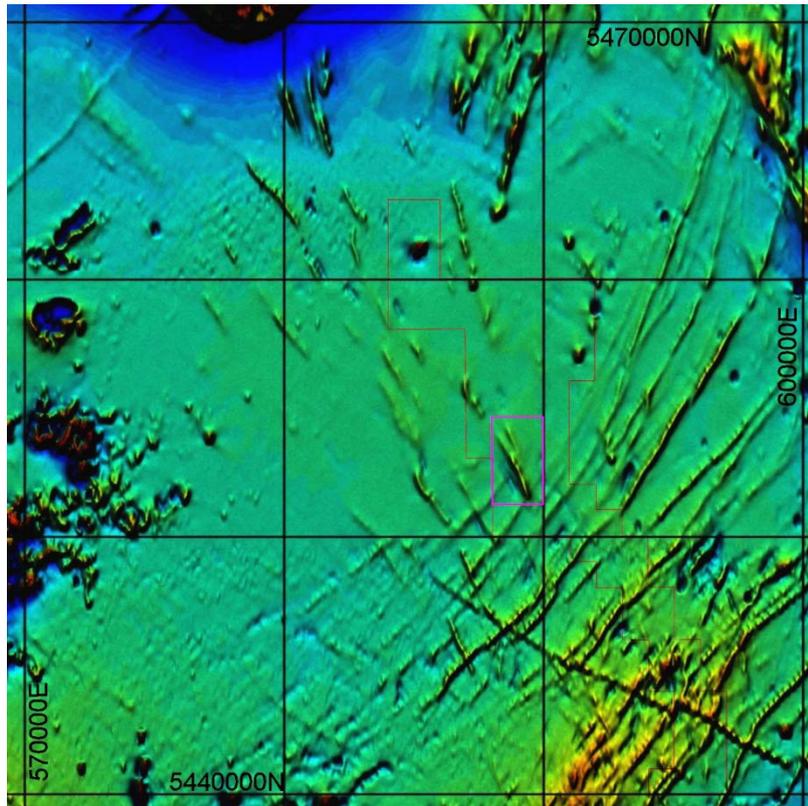
### ***The Old Chum Dam Anomalies. Strategic Location.***

The small portion of MHM EL3 that covers the Old Chum Dam area sits over a number of the more significant intersecting anomalies and structures that characterise much of the northern part of the Poimena pluton. If there is going to be any significant mineralisation within the granite fractures or beneath the shallow part of the pluton, it should show up in this area.

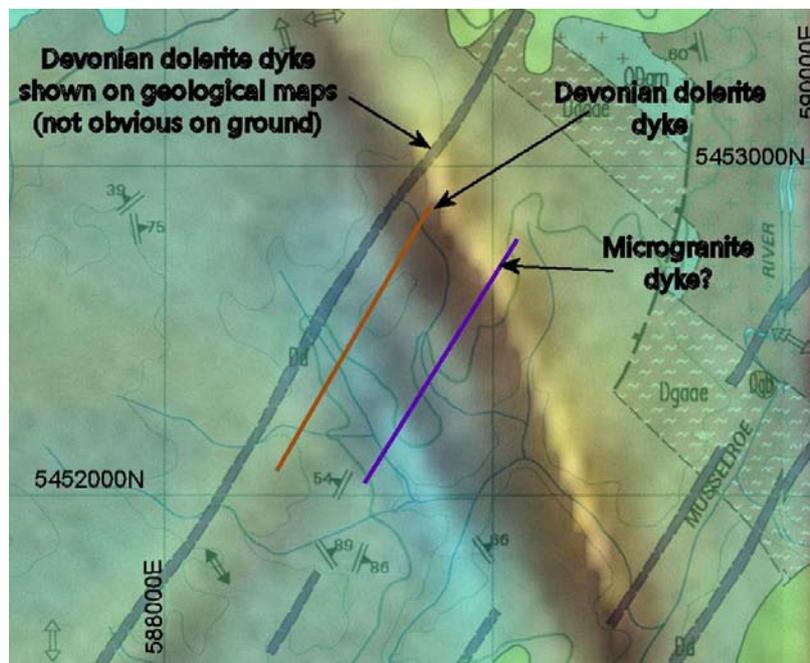
There are three types of magnetic anomalies in this area (see figure 1). Two of them are NNW-trending and one is NNE-trending. The NNW-trend has magnetic anomalies that are both considerably higher and considerably lower in magnetism than the surrounding granites. Out of these two NNW-trending anomalies we have some idea what the magnetic low ones indicate, but we do not know what the magnetic high ones indicate, although it is reasonable to suppose that the two are related to the same geological event. It can also be seen in figure 1 that these two NNW types of anomalies are fairly common across the north-eastern quarter of the Poimena granodiorite.

In addition to the magnetic anomalies there is at least one Devonian dolerite dyke and a microgranite intrusion (probably a dyke) which both have the same trend as the NNE-trending magnetic anomaly (figures 1 & 2) and which both intersect the NNW-trending magnetic anomalies. The area shown in figure 1 is also close to the northern boundary of a deep low gravity trough (see figure 3) that may be indicating a layering of granites beneath the southern part of the Poimena granodiorite. This possible layering, or at least the extra granite depth, has had some effect on the NNW-trending magnetic anomalies as they tend to die out to the south over this low gravity area.

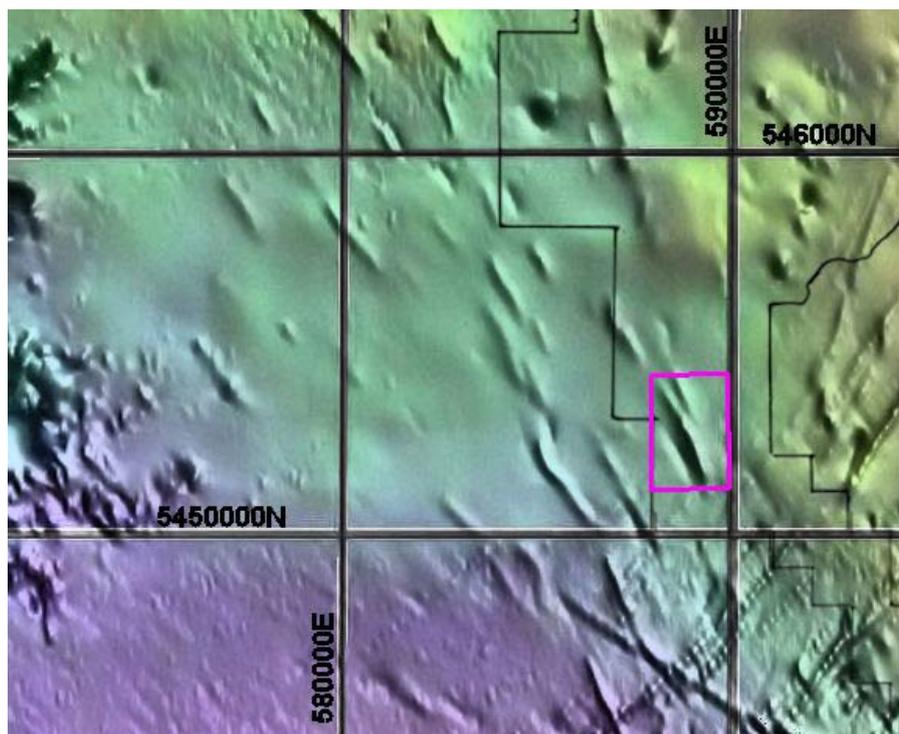
The mineralisation likelihood of such a structure system would seem to be quite high.



**Figure 1.** Part of the NE Tasmania magnetics. MHM lease area is shown as the black outline. The Old Chum Dam magnetic anomalies are shown within the pink outline. (10 km grid)



**Figure 2.** Location of dolerite and microgranite dykes on combined magnetics and geology of the Old Chum Dam area. (1 km grid)



**Figure 3.** Old Chum Dam anomaly area (in red) in relation to low gravity basin (purple shading) (10 km grid)

### ***The Old Chum Dam Anomalies. Exploration.***

Exploration has so far been limited to:

1. Initial surface familiarisation (i.e. a lot of walking and looking)
2. A trial set of radiation (total) measurements (could now be expanded)
3. A Self Potential (SP) survey
4. Incidental and “point-of-interest” NITON analyses

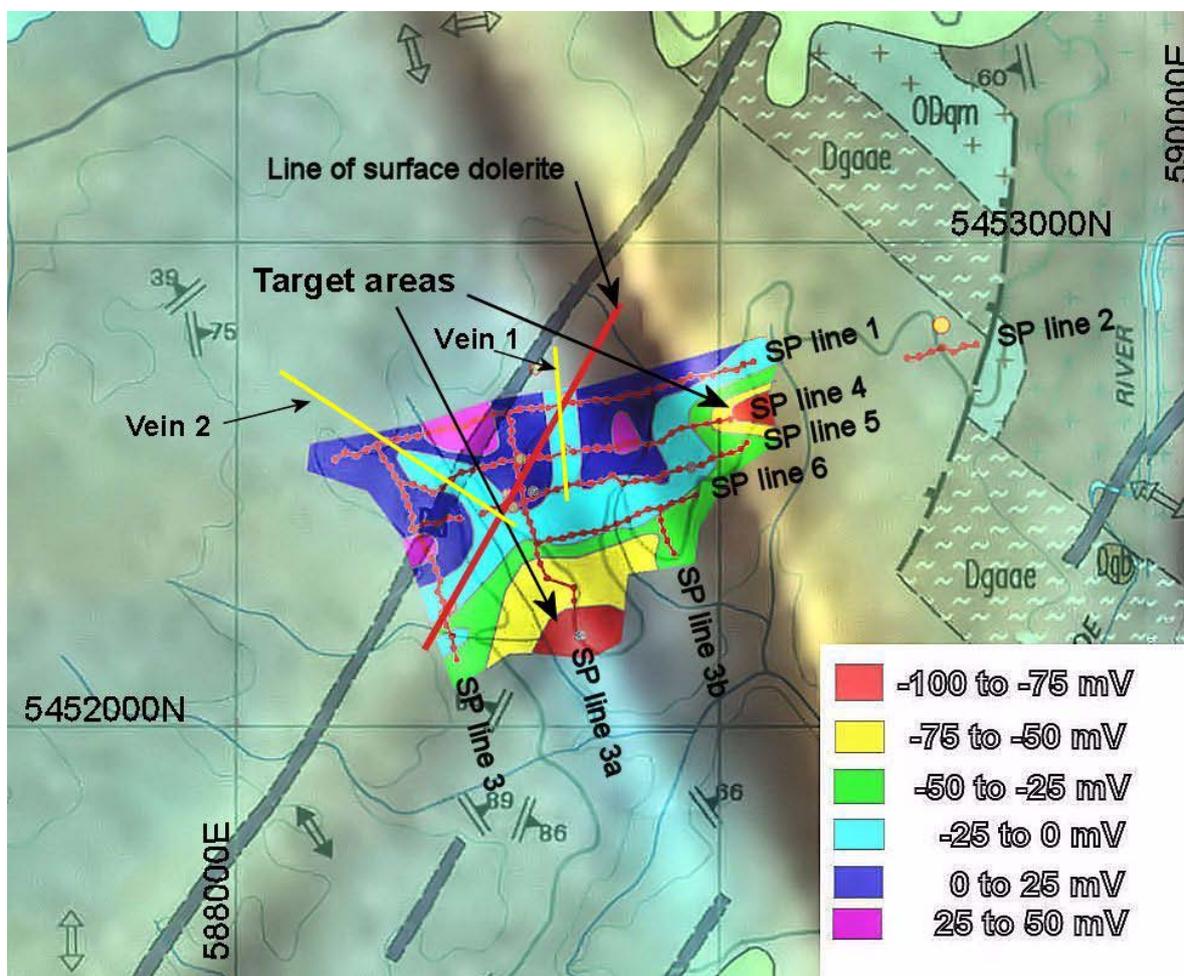
#### ***SP survey***

(Measurements in Appendix A)

SP measures the DC voltages that occur naturally in the ground as a result of mineral decomposition or alteration and its associated ion movement between oxidised and unoxidised regions. It is not a method that can be used in areas where there are lots of clays or where sulphides such as pyrite occur widely throughout layers such as shales. Thus it can not be used effectively across much of the Mathinna in the NE. However, in the granite areas of the NE it works quite well.

Like many electrical methods it will not pick up oxide minerals (e.g. cassiterite) unless these happen to be surrounded by more active minerals such as sulphides.

The SP survey results are shown in figure 4. The places of possible mineralisation are those that show up as most negative, and the contour colouring highlights the negative.



**Figure 4.** SP survey results, based on a 3-point moving average of the actual measurements, superimposed on combined magnetics/geology (1 km grid). The central and western area is the granodiorite of the Poimena pluton, while the area at upper right shows the western edge of the Gardens pluton, with some (probably shallow) Mathinna sediments trapped between the two plutons.

Two slightly negative N and NW-trending channels (light blue) can be seen in the results. These are probably indicating narrow veins (labelled veins 1 and 2) containing some mineralisation similar to that seen in the Star Hill Addit just south of Gladstone. In this context it is therefore interesting that some of the dolerite fragments, probably from near the outer wall of the dyke, where it intersects vein 2, do show some sulphide minerals (at least three, with one of these probably pyrite) associated with xenoliths.

Other than the above sulphides around and within xenoliths, the dolerite dyke does not show up in the current SP results as being of any exploration interest, but the xenoliths and sulphides within the dolerite suggest that the veins 1 and 2 preceded the dolerite intrusion.

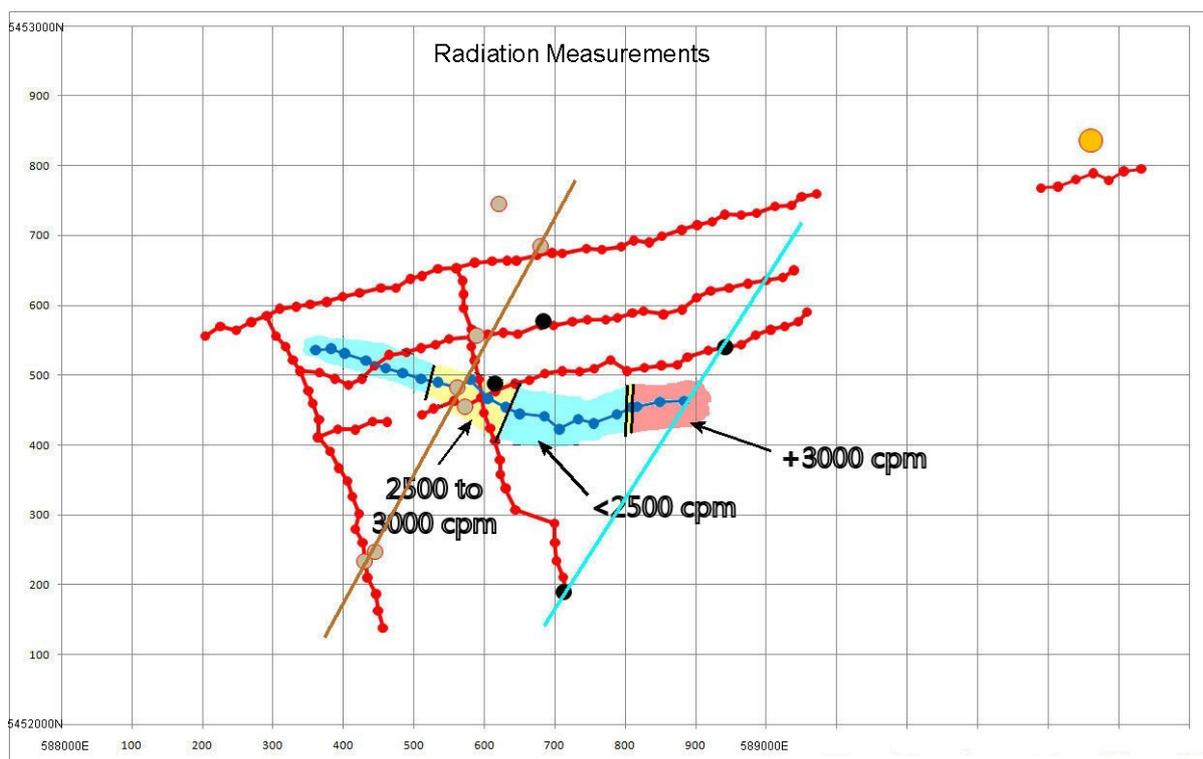
The main exploration interest concerns the two much more negative areas, shaded as red in figure 4, which have been labelled as “target areas”. These occur at the intersection of the

apparent microgranite dyke with both the magnetic high and magnetic low anomalies, with signs of a lower mineralisation channel between them. As the low magnetic anomaly is associated elsewhere (Star Hill) and indicated to be associated here (by limited NITON rock and soil analyses) with tin-greisen mineralisation, while the high magnetic anomaly must contain some quite magnetic minerals and is suspected by MRT to be some type of mafic dyke, we are probably looking at two different styles of mineralisation at the two target areas, with some interaction between them.

## **Radiation**

(Measurements in Appendix B)

The initial trial radiation measurements (figure 5) were carried out prior to the SP survey, and show an increased radiation associated with both the dolerite dyke and the (then not recognised) microgranite, with the highest radiation being over the microgranite dyke. The high radiation over the dolerite dyke coincides approximately with the intersection of the dyke with vein 2 in figure 4. It would be interesting (curiosity satisfying) to know if this high radiation continues along the dyke.



**Figure 5.** Initial trial radiation (total) measurements. Higher radiation occurs over both the dolerite (brown line) and microgranite (blue line) dykes. Background over the surrounding granodiorite is between 1200 and 1500 cpm.

The radiation looks more at the hydrothermal fluid activity than the dykes themselves and can be quite a useful method for locating breccia-filled and still-open fractures in the granite. One implication of the above radiation measurements is that soil geochemistry,

which is not very productive for initially locating mineralisation in granite areas, could be used over at least the microgranite dyke to get some idea of the type of mineralisation below. In this case, and assuming hydrothermal activity all along the microgranite dyke, it may indicate differences between the two targets identified by the SP survey.

## **Analyses**

(Analyses in Appendix C)

Some initial approximate rock analyses were carried out, with a NITON hand-held XRF analyser, at various points along SP line 1 where granite was exposed, and at the quarry a further half km east of the end of line 1. Because the equipment was no longer available after these measurements, the rock analyses were not able to be expanded for the more interesting rocks along later SP lines.

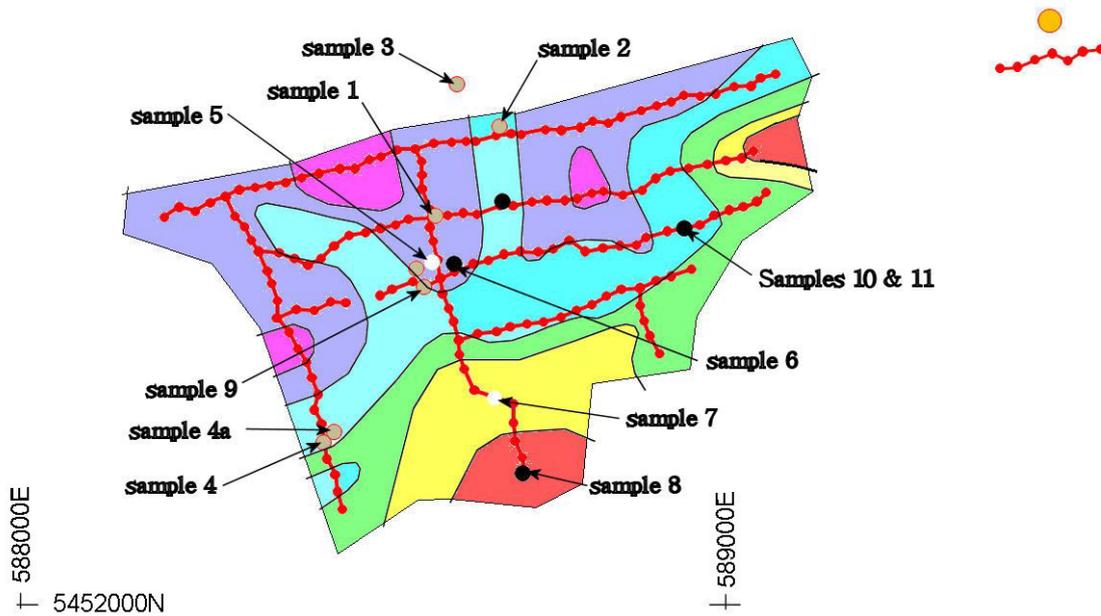
Rock exposures along SP line 1 are mainly limited to the west and eastern ends, with little or no rock exposed in the centre of the line. Rock values at the western end showed Sn between 100 and 160 ppm and Sb between 100 and 165 ppm, but at the eastern end the values had fallen to Sn between 50 and 80 ppm and Sb between 50 and 90 ppm. The values of these two elements seem to follow each other quite well. One suspicious-looking weathered brown/black rock at the western end of the line that may have once been either a basalt or a dolerite gave cobalt to 0.14%, but, although the rock was considerably more weathered, I suspect it came from the basalt road-making material used (from Derby?).

The above high Sn/Sb values coincide with the expected intersection of vein 2 with the SP line 1 (see figure 4), - although vein 2 was not known at the time.

Routine NITON soil analyses were tried, but too many of the line 1 sites had little near the surface except fairly barren coarse sand.

Rock analyses across a vein stockwork in an aplite-greisen environment exposed in the quarry were far more interesting, with values for Co (to 0.11%), Ni (to 208 ppm) and Cr (to 225 ppm), and occasional Sn and Sb values to 130 and 160 ppm respectively. Cu was normally less than error, but one reading of 150 ppm was obtained. The high Co values here appeared to be associated with thin films of manganese oxide, and were therefore not widespread.

Some high Co values (600 ppm) were also obtained later from surface rocks, near where the indicated dolerite dyke and vein 2 intersect (see figure 4). Interesting surface rocks were collected from a number of sites across the surveyed area, as shown in figure 6.



**Figure 6.** Location of the surface rocks collected across the survey area. Many of these were analysed by NITON, but the NITON was no longer available for others. The dolerite samples suggested a different location for the dolerite dyke than indicated on the geological map.

#### Rock sample locations

<u>Sample no.</u>	<u>Rock</u>	<u>E</u>	<u>N</u>
1	dolerite	588589	5452557
2	dolerite	588680	5452685
3	?	588620	5452745
4	dolerite	588430	5452233
4a	dolerite	588440	5452243
5	weathered granite	588592	5452494
6	Aplite??	588610	5452480
7	weathered granite	588670	5452309
8	microgranite	588730	5452189
9	dolerite	588573	5452455
10	microgranite	588942	5452540
11	microgranite	588942	5452540

## ***The Old Chum Dam Anomalies. Conclusions.***

In this granite environment, the SP method has been able to provide a meaningful and coherent picture of possible mineralisation sites. Even though SP lines 1, 3, 3a and 4 were each measured at different times, the rectangle formed by these lines, over a total distance of 800 m, had a closure error of only 10 to 13 mV at the intersection of lines 3a and 4. This gives considerable confidence in the overall survey results. The fit of the SP data with other data such as radiation, magnetics and observed surface features (dykes) adds further confidence.

While the earlier Star Hill SP results also showed similar accuracy, the deeper “Old Chum” mineralisation signal is almost four times that shown at Star Hill, indicating a mineralisation at the identified target areas many times greater (but deeper) than seen in the Star Hill addit. The vein 1 and 2 signal is comparable to (but a little deeper than) that measured over the vein stockwork seen in the Star Hill addit.

The SP survey here has achieved considerably more than just the identification of two mineralised target areas for future drilling. More importantly it has identified a combined structural and magnetic situation that can be expected to show mineralisation where it occurs elsewhere within the Poimena pluton.

Some auger sampling and geochemistry across the saddle just north of the southern target area, and also across the northern target area, could be a next step. A further step, prior to any drilling, could be some ground electromagnetics, as this would further define the nature of the SP source by including factors such as resistivity and frequency response.

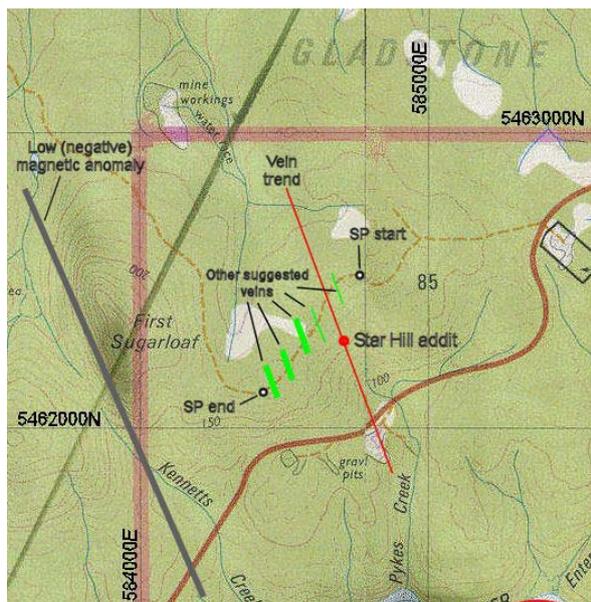
Although there is not sufficient SP measurement across the indicated target areas to get a good idea of depth to target, I think it could be expected to be around 250 to 300m, with the depth to the vein 1 and 2 sources being probably about half that.

## ***In Context with other Poimena pluton areas***

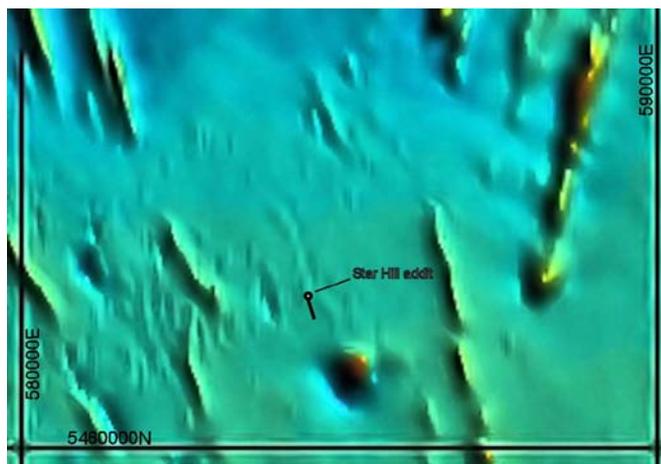
### ***Star Hill addit***

This addit is located just south of Gladstone just east of a prominent low magnetism NNW-trending anomaly and above a much weaker low-magnetism anomaly, as illustrated in figure 6. It is an area of aplite and tin/tungsten greisen. The past history of the addit is not known.

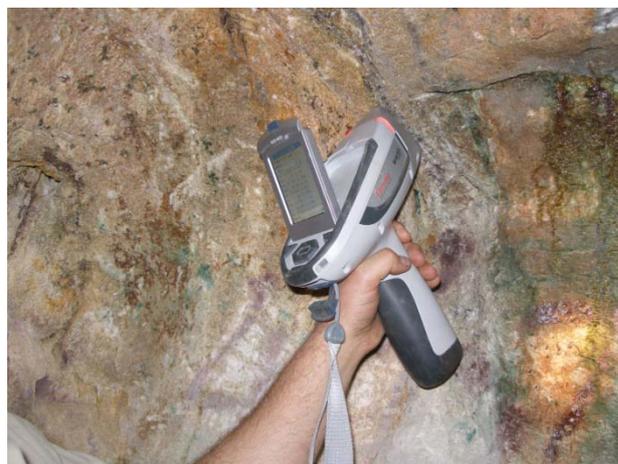
It illustrates the type of mineralisation that was expected over the low magnetic anomaly at Old Chum dam, and which may exist below veins 1 and 2 shown in figure 4, but perhaps without the tungsten.



(a)



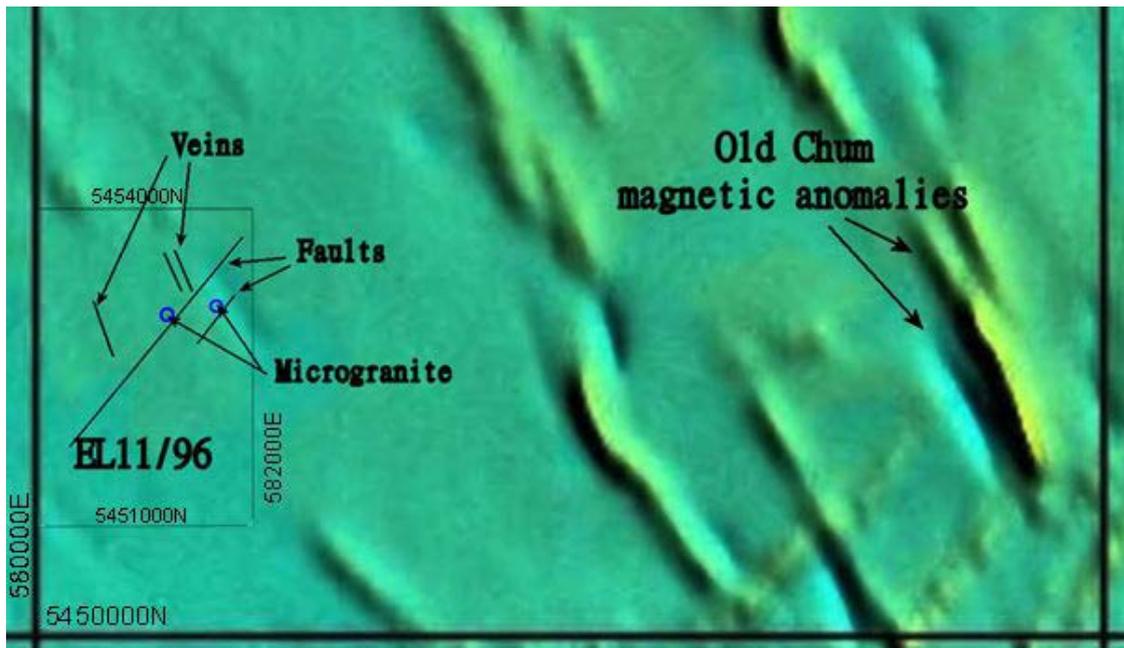
(b)



**Figure 6:** Star Hill addit. (a) Location just south of Gladstone. (b) relationship of addit to magnetic features in the area. (c) malachite mineralisation in addit roof. (d) Sn/W veins in end of addit.

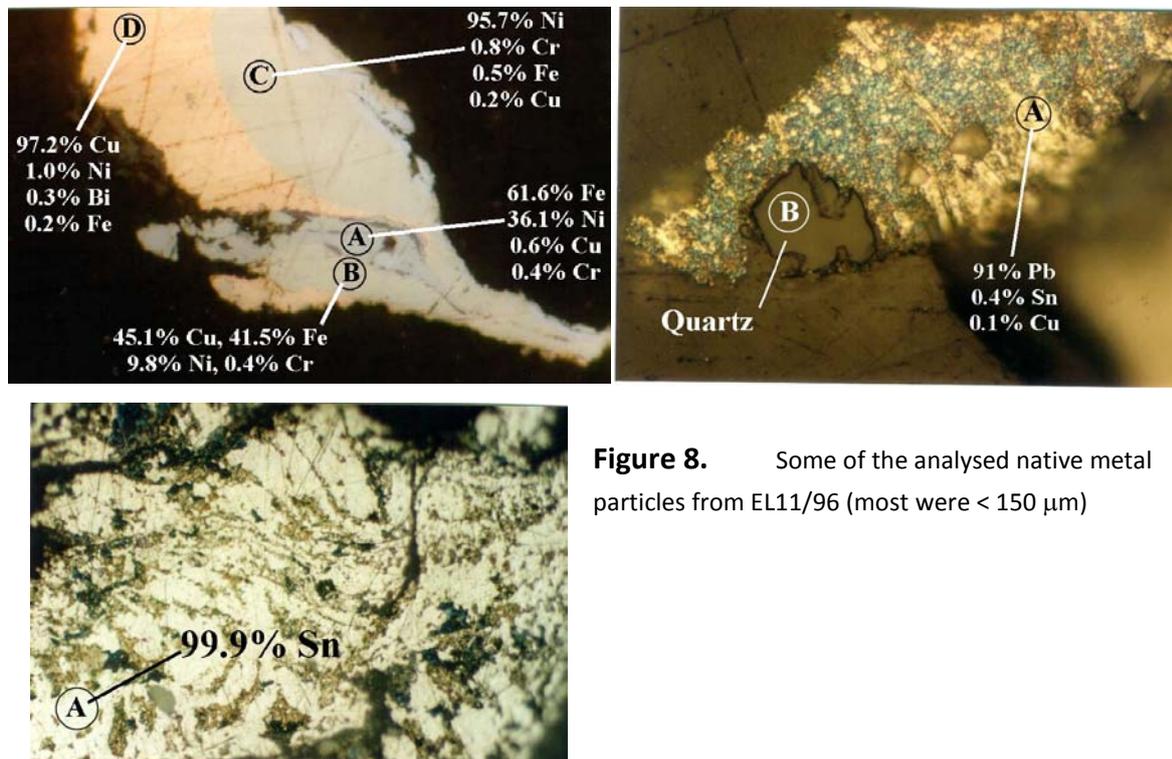
**EL 11/96**

This is an area about 7km west of Old Chum dam that was investigated between 1996 and 2001 for the somewhat anomalous occurrence of native metal particles. At the time nothing was known of any magnetic anomalies in the area. Quartz veins and breccia zones were identified which are now seen to have the same NNW-trend associated with the magnetic high and low anomalies of the Old Chum dam area, and two possible faults with trends that are now seen to have a similar trend to the dolerite and microgranite dykes of the Old Chum dam area. Microgranite was also found in the area, as shown in figure 7.



**Figure 7.** Location of EL11/96 in relation to the Old Chum dam area.

Native metals particles of Fe, Cu, Sn, Zn, Ni and Cr (identified by electron probe analysis) were found to be associated with the quartz veins and breccia zones (Allen et al., 2004), plus spinel that differed from that of the Tertiary basalts, and magnesian ilmenites. Spinel compositions were found to vary between locations (approximately NE to SW) and the native metal compositions varied from Zn/Cu/Pb in the NE to Ni/Cr in the SW. At the time these differences were quite a puzzle, but they can now be seen to fit with an expected (but reversed) difference in mineralisation along a SW trend in the Old Chum dam area.



**Figure 8.** Some of the analysed native metal particles from EL11/96 (most were < 150  $\mu\text{m}$ )

## Appendix A: (SP survey measurements)

(+ve terminal always to E or to N. Pots at approx. 25m intervals and 'leap-frogged')

### Self Potential Line 1

<u>E</u>	<u>N</u>	<u>Reading</u>	<u>Cum. value</u>
588204	5452556	0	0
588225	5452570	7.8	7.8
588248	5452564	3.8	11.6
588269	5452576	-1.8	9.8
588291	5452585	12.4	22.2
588310	5452595	-21	1.2
588333	5452598	7	8.2
588353	5452601	1.9	10.1
588376	5452605	-10.8	-0.7
588399	5452612	15	14.3
588423	5452618	55	69.3
588453	5452625	-67.6	1.7
588474	5452625	46.7	48.4
588495	5452638	-3.2	45.2
588511	5452642	-38.9	6.3
588534	5452652	32.2	38.5
588560	5452653	-25.1	13.4
588586	5452661	4	17.4
588611	5452663	9	26.4
588632	5452664	-15.1	11.3
588645	5452664	-22.1	-10.8
588675	5452672	5.3	-5.5
588696	5452675	7	1.5
588710	5452674	1.4	2.9
588745	5452681	1.1	4
588767	5452680	14.6	18.6
588794	5452684	-1.1	17.5
588812	5452693	-2.8	14.7
588834	5452690	-12.3	2.4
588852	5452699	20.8	23.2
588880	5452708	-34.2	-11
588902	5452715	1.6	-9.4
588923	5452720	21.6	12.2
588941	5452730	4.9	17.1
588964	5452729	-25	-7.9
588986	5452732	13	5.1
589012	5452742	-2	3.1
589036	5452743	3.1	6.2
589050	5452755	-23.6	-17.4
589071	5452760	7.5	-9.9

### SP line 2

<u>Easterly</u>	<u>Northerly</u>	<u>Reading</u>	<u>Cum. value</u>
589390	5452768	0	0
589414	5452770	-2.8	-2.8
589439	5452780	2.5	-0.3
589464	5452789	-13.7	-14
589486	5452779	19.5	5.5
589507	5452792	-2.7	2.8
589532	5452795	26.7	29.5

**SP line 3****Note:** Cum. value starts at 588291E 5452585N on line 1

<u>Easterly</u>	<u>Northerly</u>	<u>Reading</u>	<u>Cum. value</u>
588291	5452585	0	22.2
588304	5452556	28.9	-6.7
588318	5452541	-12.4	5.7
588328	5452522	-2.5	8.2
588338	5452506	-6	14.2
588350	5452478	-5.3	19.5
588356	5452460	19.6	-0.1
588365	5452436	-18.2	18.1
588364	5452411	-9.1	27.2
588381	5452391	1.1	26.1
588393	5452367	5.7	20.4
588406	5452348	-10.1	30.5
588413	5452326	0.8	29.7
588422	5452302	36.9	-7.2
588417	5452280	3.2	-10.4
588427	5452260	2.3	-12.7
588430	5452235	17.6	-30.3
588434	5452210	-2.1	-28.2
588446	5452187	7.4	-35.6
588449	5452163	-28.2	-7.4
588456	5452138	9.1	-16.5

**SP line 3a****Note:** Cum. value Starts at 588560E 5452653N on line 1

<u>Easterly</u>	<u>Northerly</u>	<u>Reading</u>	<u>Cum. value</u>
588560	5452653	0	13.4
588569	5452635	-12.1	25.5
588570	5452616	23.3	2.2
588570	5452596	17.1	-14.9
588582	5452566	-28.1	13.2
588581	5452541	4.3	8.9
588586	5452521	-3	11.9
588592	5452494	12.7	-0.8
588596	5452468	-21.1	20.3
588599	5452446	33.5	-13.2
588608	5452424	-15	1.8
588615	5452406	11	-9.2
588622	5452379	-16.1	6.9
588623	5452358	97.5	-90.6
588630	5452338	-27.7	-62.9
588644	5452307	7	-69.9
588699	5452288	4.4	-74.3
588700	5452260	-13.6	-60.7
588702	5452234	36.7	-97.4
588712	5452211	-23.6	-73.8
588716	5452189	8.1	-81.9

**SP line 3b****Note:** Cum. value starts at 588879E 5452454N on line 6

<u>Easterly</u>	<u>Northerly</u>	<u>Reading</u>	<u>Cum. value</u>
588879	5452454	0	-11.3
588879	5452428	26.5	-37.8
588885	5452406	20.6	-58.4
588893	5452385	-19.6	-38.8
588907	5452360	-6.5	-32.3

**SP Line 4****Note:** Cum. value starts at 588338E 5452506N on line 3

<u>Easterly</u>	<u>Northerly</u>	<u>Reading</u>	<u>Cum. value</u>
588338	5452506	0	14.2
588366	5452504	-37.6	-23.4
588388	5452495	25.5	2.1
588407	5452486	5.5	7.6
588426	5452495	-9.3	-1.7
588444	5452513	-13	-14.7
588465	5452529	5.7	-9
588489	5452533	1.7	-7.3
588510	5452539	5.1	-2.2
588531	5452544	14.1	11.9
588550	5452552	37	48.9
588582	5452554	-45.4	3.5
588605	5452558	-3.2	0.3
588627	5452561	19.7	20
588647	5452559	-31	-11
588680	5452572	-5.3	-16.3
588698	5452571	10.2	-6.1
588725	5452577	21.2	15.1
588746	5452579	-14.1	1
588772	5452579	49	50
588789	5452582	-35.5	14.5
588810	5452589	54.6	69.1
588826	5452592	-70.4	-1.3
588854	5452587	23.3	22
588881	5452594	-50.2	-28.2
588901	5452611	15.3	-12.9
588921	5452621	14.1	1.2
588947	5452625	-29	-27.8
588974	5452631	-29.9	-57.7
677000	5452636	-2.6	-60.3
588023	5452640	-30.8	-91.1
588039	5452650	9.2	-81.9

### SP Line 5

**Note:** Cum. value for start of western segment starts at 588364E 5452411N on line 3, and for western segment, where it crosses line 3a at 588596E 5452468N.

<u>Easterly</u>	<u>Northerly</u>	<u>Reading</u>	<u>Cum. value</u>
588364	5452411	0	27.2
588392	5452423	-19	8.2
588417	5452422	-3.6	4.6
588441	5452434	20.4	25
588462	5452433	-30.5	-5.5
588511	5452443	-13.1	5.3
588528	5452452	5.8	-7.8
588557	5452463	-11.2	-2
588573	5452455	33.5	-13.2
588596	5452468	0	20.3
588616	5452477	-12	8.3
588643	5452488	-5.7	2.6
588664	5452493	7.2	9.8
588686	5452502	-23.6	-13.8
588710	5452506	23.5	9.7
588735	5452505	-20.4	-10.7
588756	5452509	23.6	12.9
588779	5452522	-19.8	-6.9
588802	5452506	-6.2	-13.1
588827	5452511	-8.4	-21.5
588851	5452514	17.8	-3.7
588874	5452515	-0.8	-4.5
588888	5452526	12.2	7.7
588918	5452535	-10.4	-2.7
588942	5452540	-4.2	-6.9
588964	5452544	-12.1	-19
588985	5452557	5.8	-13.2
589006	5452565	-22	-35.2
589026	5452570	10.6	-24.6
588045	5452577	-3.7	-28.3
588058	5452590	-6.8	-35.1

### SP Line 6

**Note:** Cum. value starts at 588622E 5452379N on line 3a

<u>Easterly</u>	<u>Northerly</u>	<u>Reading</u>	<u>Cum. value</u>
588622	5452379	0	6.9
588649	5452388	-23.1	-16.2
588676	5452391	6.2	-10
588695	5452398	9.3	-0.7
588719	5452402	-20.5	-21.2
588742	5452405	14.6	-6.6
588767	5452412	10.6	4
588789	5452422	-20.5	-16.5
588811	5452430	17.5	1
588832	5452442	-23	-22
588853	5452452	8.9	-13.1
588879	5452454	1.8	-11.3
588902	5452465	1.2	-10.1
588923	5452471	-11.6	-21.7
588952	5452481	-21	-42.7

**Appendix B (radiation measurements)****(Using a Technical Associates Model PUG-1)**

<b>E</b>	<b>N</b>	<b>(cpm)</b>
588360	5452536	2200
588382	5452538	2200
588402	5452531	1500
588432	5452521	2300
588460	5452510	2300
588484	5452503	2200
588510	5452495	2700
588534	5452490	2500
588562	5452482	2900
588580	5452494	2100
588605	5452467	2000
588630	5452454	2600
588650	5452445	2500
588685	5452441	2700
588706	5452423	2600
588733	5452437	2400
588755	5452431	1900
588788	5452444	2000
588809	5452454	2700
588817	5452455	3200
588849	5452462	3200
588883	5452463	3000

## Appendix C (NITON and AAS analyses)

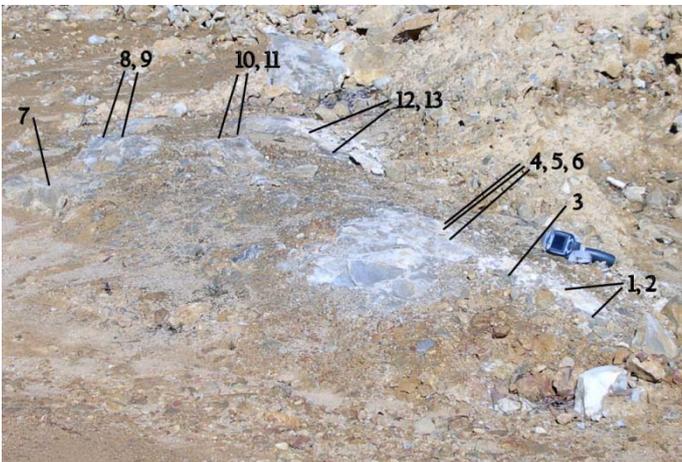
### Locations of Gunns Quarry numbered measurement sites.



Western exposure



Eastern exposure



Sites 1 to 13



Sites 14 to 21

The 'white vein' samples listed in the results were taken from loose pieces of the above 'western exposure' vein material that someone else had gone to a fair amount of trouble to break free. In that context it is interesting that those were the samples that contained the cobalt. Some other 'white vein' hand samples were collected and later analysed by NITON (see next page).

**Numbered sample sites, - Gunns Quarry**

	As	Pb	Zn	Th	Zr	Sr	U	Rb	Ni	Co	Fe	Mn	Cr	Ti	Sc	Ca	K	S	Ag	Sn	Sb	Ba	Cs	Te	Cd	Pd
1	<LOD	<LOD	82.9	<LOD	326.2	65.5	<LOD	307.2	<LOD	<LOD	25252.4	459.5	<LOD	3218.3	<LOD	8741.6	8623.4	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
2	<LOD	42.2	<LOD	<LOD	12.2	62.3	<LOD	200.5	<LOD	<LOD	4189.2	<LOD	<LOD	362.4	<LOD	2070.0	41909.5	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
3	<LOD	20.5	<LOD	<LOD	363.2	147.3	<LOD	100.7	<LOD	<LOD	11767.6	131.1	122.1	3209.8	<LOD	3656.2	11680.3	26983.2	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
4	<LOD	37.0	<LOD	48.0	335.4	30.3	<LOD	103.1	<LOD	<LOD	16814.9	<LOD	<LOD	2544.4	<LOD	2356.7	15233.1	<LOD	17.0	78.8	67.7	711.5	151.6	270.9	<LOD	<LOD
5	<LOD	<LOD	<LOD	40.3	237.5	55.4	16.2	55.7	<LOD	<LOD	5946.0	<LOD	<LOD	1021.5	<LOD	2311.7	11359.0	21702.9	<LOD	73.8	62.6	440.9	119.4	228.2	<LOD	<LOD
6	<LOD	21.9	50.0	26.0	616.4	20.5	<LOD	143.7	<LOD	<LOD	20941.7	316.6	112.8	4719.9	<LOD	2686.1	12087.5	<LOD	23.9	96.0	94.4	510.6	158.2	303.2	21.8	<LOD
7	<LOD	17.4	32.4	22.6	255.2	42.2	<LOD	94.1	<LOD	<LOD	14511.3	146.6	<LOD	2782.4	<LOD	3154.8	12834.0	<LOD	<LOD	79.7	69.7	543.2	149.8	255.6	<LOD	<LOD
8	<LOD	17.7	<LOD	<LOD	359.3	96.1	<LOD	108.0	<LOD	<LOD	13157.7	<LOD	<LOD	3134.9	<LOD	2405.0	17541.5	25289.7	14.0	72.2	91.3	767.5	161.5	266.2	25.0	<LOD
9	<LOD	17.7	<LOD	<LOD	250.0	186.0	<LOD	146.2	<LOD	<LOD	6712.7	<LOD	88.9	2105.0	<LOD	3817.6	18473.3	<LOD	<LOD	61.3	89.3	595.9	141.8	272.3	<LOD	<LOD
10	<LOD	16.2	43.6	<LOD	396.1	80.1	<LOD	121.0	<LOD	<LOD	16629.2	161.3	105.3	3407.4	<LOD	2910.1	20143.6	34837.0	15.1	86.9	93.1	604.3	160.9	307.0	18.7	<LOD
11	<LOD	<LOD	<LOD	22.2	361.4	51.6	<LOD	80.2	<LOD	<LOD	15338.5	147.7	107.6	2781.6	<LOD	2658.9	14782.0	<LOD	<LOD	85.7	90.0	769.6	173.7	340.6	26.9	<LOD
12	<LOD	<LOD	41.3	22.5	127.7	98.6	<LOD	249.4	<LOD	<LOD	33449.5	243.0	86.7	3181.3	<LOD	2306.9	26574.8	27923.4	<LOD	95.2	68.4	1399.7	185.2	331.1	25.7	<LOD
13	<LOD	86.0	<LOD	<LOD	13.7	51.0	<LOD	229.0	<LOD	<LOD	1752.4	<LOD	<LOD	409.9	<LOD	2688.5	67786.4	<LOD	<LOD	113.7	116.3	827.9	212.1	481.6	35.0	26.6

**Site 2 (689469E 5452854N)**

14	<LOD	17.3	22.2	16.8	256.3	23.8	<LOD	64.0	<LOD	<LOD	12848.1	<LOD	57.7	2913.2	<LOD	2166.8	20614.9	28071.7	12.9	78.1	72.7	762.0	130.8	224.5	22.2	<LOD
15	<LOD	26.7	77.4	23.5	135.7	83.1	<LOD	157.0	114.9	<LOD	44745.6	428.3	155.4	3010.1	<LOD	1684.6	24970.3	<LOD	<LOD	65.7	48.4	1252.5	140.4	144.5	<LOD	<LOD
16	<LOD	<LOD	<LOD	31.6	372.1	22.8	<LOD	73.8	<LOD	<LOD	10968.4	<LOD	<LOD	3545.1	<LOD	2273.1	14694.7	<LOD	64.4	43.3	748.6	123.0	208.2	<LOD	<LOD	<LOD
17	59.2	27.7	<LOD	36.6	154.2	20.3	<LOD	67.0	<LOD	<LOD	#####	<LOD	<LOD	1211.8	<LOD	530.8	2919.8	<LOD	<LOD	137.0	167.7	1597.0	333.7	594.8	<LOD	<LOD
18	<LOD	21.2	37.5	24.5	147.9	47.5	<LOD	168.9	<LOD	<LOD	22494.1	<LOD	170.4	4430.3	<LOD	195.7	32266.1	<LOD	<LOD	86.6	78.4	1118.9	173.1	290.3	21.9	<LOD
19	<LOD	<LOD	73.8	36.8	134.0	48.3	<LOD	229.4	<LOD	<LOD	34496.6	233.8	102.5	2835.7	<LOD	1857.9	22606.4	<LOD	<LOD	84.6	68.7	1106.1	149.5	223.1	<LOD	<LOD
20	<LOD	24.6	54.5	32.8	152.6	37.7	<LOD	128.9	<LOD	<LOD	51900.2	400.3	111.6	2717.4	<LOD	1649.6	17468.4	<LOD	<LOD	78.8	76.2	813.7	173.3	280.9	<LOD	<LOD
21	<LOD	<LOD	<LOD	<LOD	40.5	15.0	<LOD	53.4	<LOD	<LOD	11867.1	136.6	108.6	1797.5	<LOD	2291.5	11280.9	22776.9	<LOD	68.0	98.3	572.2	158.3	313.9	20.6	27.3

**White vein loose samples**

(on surface around site 1)

	As	Pb	Cu	Zn	Th	Zr	Sr	Rb	Ni	Co	Fe	Mn	Cr	Ti	Sc	Ca	K	S	Ag	Sn	Sb	Ba	Cs	Te	Cd	Pd
	<LOD	25.0	<LOD	153.6	52.8	28.1	230.4	25.4	111.3	93.5	492.9	976.7	15341.8	139.2	<LOD	2041.4	34882.6	<LOD	<LOD	85.0	89.8	628.3	164.1	347.0	18.1	<LOD
	<LOD	48.5	<LOD	<LOD	29.6	116.9	57.0	123.3	<LOD	<LOD	4419.7	<LOD	<LOD	256.2	<LOD	4138.2	23358.8	<LOD	16.3	84.2	104.8	567.4	159.1	310.7	22.3	<LOD
	<LOD	<LOD	<LOD	<LOD	35.7	27.0	316.5	142.5	260.7	<LOD	16942.6	138.2	<LOD	3870.6	<LOD	2260.2	71062.1	30891.0	<LOD	62.0	88.6	655.8	154.0	253.6	<LOD	<LOD
	<LOD	18.2	<LOD	<LOD	13.8	118.3	32.6	116.1	<LOD	<LOD	1798.9	<LOD	<LOD	807.3	<LOD	2075.1	31943.2	<LOD	13.7	70.4	95.5	472.5	145.5	303.8	22.2	<LOD
	46.8	400.2	<LOD	46.7	81.3	280.0	74.0	33.3	208.7	1119.1	5039.6	17129.8	225.2	<LOD	<LOD	3455.9	5596.2	24606.5	15.8	91.6	126.4	684.1	171.3	378.5	25.1	<LOD

**Rocks to south of quarry**

Weathered granite rocks on ground immediately to SW of quarry (no coordinates taken)

	As	Pb	Zn	Th	Zr	Sr	U	Rb	Ni	Co	Fe	Mn	Cr	Ti	Sc	Ca	K	S	Ag	Sn	Sb	Ba	Cs	Te	Cd	Pd
	<LOD	34.94	32.41	24.66	252.30	25.59	<LOD	126.45	<LOD	<LOD	47047.15	<LOD	136.90	3040.16	<LOD	1497.51	18451.47	28762.95	<LOD	94.42	86.68	974.15	170.49	342.96	24.23	<LOD
	<LOD	22.33	41.83	20.77	219.47	59.93	<LOD	134.29	<LOD	306.15	25504.36	226.73	135.12	3409.03	<LOD	2344.47	29041.28	<LOD	<LOD	99.46	90.58	1138.36	184.19	349.71	21.68	<LOD
	<LOD	<LOD	<LOD	13.68	365.77	17.48	<LOD	46.99	<LOD	<LOD	13922.67	241.94	85.01	2331.27	<LOD	2187.87	14036.16	<LOD	<LOD	74.20	102.42	595.36	191.91	350.54	18.82	<LOD
	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	706.36	<LOD	<LOD	401.82	<LOD	1996.28	14444.60	24716.13	15.02	71.70	70.51	486.90	156.80	297.02	20.17	<LOD
	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	368.54	<LOD	<LOD	165.95	<LOD	1954.30	1981.49	26077.57	17.62	62.75	70.06	448.70	128.10	273.97	16.77	<LOD

**Hand samples from Gunns quarry stockpile, just W of site 1.**

Samples of "white vein" material and fresh quartz from stockpile immediately to W of site 1																
Hand Sample	As	Pb	Cu	Zn	Ag	Sn	W	Th	Mo	Sb	Zr	Sr	U	Rb	Se	Hg
sample 1 black area	< LOD	106.4	< LOD	32.82	15.1	98.2	< LOD	< LOD	< LOD	91.76	136.43	25.1	< LOD	210	< LOD	< LOD
sample 1 white area	< LOD	16.77	< LOD	< LOD	< LOD	68	< LOD	40.04	< LOD	88.19	123.13	34.76	< LOD	18.34	< LOD	< LOD
sample 2 black area	< LOD	84.28	175.6	58.61	21.82	112	< LOD	27.62	< LOD	122.9	290.31	20.6	< LOD	89.4	< LOD	< LOD
sample 2 white area	< LOD	15.68	< LOD	< LOD	22.77	95.2	< LOD	< LOD	< LOD	104.07	68.02	92.63	19.26	76.47	< LOD	< LOD
sample 3 black area	43.62	160.3	< LOD	< LOD	28.5	94.1	< LOD	89.07	< LOD	118.8	217.84	86.1	19.4	43.2	< LOD	< LOD
sample 3 white area	< LOD	16.22	< LOD	< LOD	21.03	71.06	< LOD	21.37	< LOD	91.6	140.05	21.19	< LOD	13.15	< LOD	< LOD
old quartz	< LOD	< LOD	< LOD	< LOD	< LOD	60.96	< LOD	< LOD	< LOD	72.14	9.93	< LOD	< LOD	< LOD	< LOD	< LOD
old quartz	< LOD	< LOD	< LOD	< LOD	< LOD	75.41	< LOD	< LOD	< LOD	73.32	23.09	< LOD	< LOD	< LOD	< LOD	< LOD
fresh quartz	< LOD	< LOD	< LOD	< LOD	18.43	96.14	< LOD	< LOD	< LOD	101.11	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
fresh quartz	< LOD	16.25	< LOD	< LOD	16.4	77.92	< LOD	< LOD	< LOD	99.21	17.31	9.61	< LOD	17.15	< LOD	< LOD
fresh quartz	< LOD	< LOD	< LOD	< LOD	13.55	82.24	< LOD	< LOD	< LOD	115.01	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
	Ni	Co	Fe	Mn	Cr	V	Ti	Sc	Ca	K	S	Ba	Cs	Te	Cd	Pd
	< LOD	697.9	1957	7924	< LOD	< LOD	< LOD	< LOD	2009	46063	< LOD	648	170	316	19.3	< LOD
	< LOD	< LOD	1166.7	119.53	< LOD	< LOD	281.79	< LOD	7130.9	7063.34	< LOD	430.68	153.49	306.31	21.44	< LOD
	125.1	574	705	20997	136	< LOD	< LOD	< LOD	1879	22950	< LOD	748	226	438	24.7	< LOD
	< LOD	< LOD	3198.6	168.5	64.93	< LOD	585.33	< LOD	3184.3	11266.5	26324.78	599.06	172.19	375.12	48.47	< LOD
	< LOD	595.2	6053	8576	< LOD	< LOD	< LOD	54.33	3673	5234	29211	665	200	421	35.3	26.2
	< LOD	< LOD	2169.5	< LOD	< LOD	< LOD	511.67	< LOD	4743.8	7259.26	25118.84	564.38	178.74	380.28	26.84	< LOD
	< LOD	< LOD	476.57	< LOD	51.61	< LOD	385.28	< LOD	1982.7	1573.76	< LOD	398.36	123.1	234.76	< LOD	< LOD
	< LOD	< LOD	479.65	< LOD	76.42	< LOD	388.85	< LOD	2143.7	1991.96	20724.49	439.55	129.79	252.79	23.26	< LOD
	< LOD	< LOD	981.42	< LOD	98.82	< LOD	654.48	< LOD	1991.9	1607.55	19508.46	554.67	171.33	397.43	22.73	23.23
	< LOD	< LOD	11967	< LOD	< LOD	< LOD	907.52	42.6	1661.2	6052.38	34783.09	508.23	167.73	300	27.52	25.09
	< LOD	< LOD	1147.6	< LOD	< LOD	< LOD	228.85	< LOD	1916.5	2366.6	< LOD	521.77	164.6	273.75	29.95	< LOD



**Left:** The three 'white vein' samples. The black areas consisted of usually thin black film, - probably of MnO<sub>2</sub>, - which also contained the Co.

**Right:** 'Fresh' quartz (left) and 'old' quartz (right)

The two 'old' quartz samples came from just W of the quarry, while the three 'fresh' quartz samples came from the main stockpile in the quarry.



## NITON rock analyses along SP line 1.

### Line 1 Rock

Units	SAMPLE	LOCATION (within 2m radius of)	As	Pb	Cu	Zn	Ag	Sn
ppm	sp1 50w rock	588248E 5452564N	< LOD	18.3	< LOD	56.47	< LOD	31.57
ppm	sp1 50w rock	588248E 5452564N	< LOD	30.32	< LOD	< LOD	< LOD	91.63
ppm	sp1 50w rock	588248E 5452564N	< LOD	< LOD	< LOD	< LOD	15.65	70.46
ppm	sp1 50w rock	588248E 5452564N	< LOD	14.53	< LOD	< LOD	< LOD	50.28
ppm	sp1 50w rock	588248E 5452564N	< LOD	17.33	< LOD	< LOD	< LOD	75.83
ppm	sp1 25w rock	588269E 5452576N	< LOD	< LOD	< LOD	< LOD	24.8	93.01
ppm	sp1 25w rock	588269E 5452576N	< LOD	23.43	< LOD	27.64	< LOD	65.44
ppm	sp1 25w rock	588269E 5452576N	< LOD	19.6	< LOD	< LOD	< LOD	95.24
ppm	sp1 0w granite	588291E 5452585N	< LOD	34.56	< LOD	43.23	23.1	85.73
ppm	sp1 0w granite	588291E 5452585N	< LOD	37.17	< LOD	58.82	19.6	111.54
ppm	sp1 0w granite	588291E 5452585N	< LOD	41.32	< LOD	< LOD	35.92	161.87
ppm	sp1 0w granite	588291E 5452585N	< LOD	27.16	< LOD	32.83	< LOD	63.78
ppm	sp1 0w granite	588291E 5452585N	< LOD	26.42	< LOD	58.65	< LOD	66.51
ppm	sp1 0w granite	588291E 5452585N	< LOD	55.58	< LOD	< LOD	20.45	93.15
ppm	sp1 0w granite	588291E 5452585N	21.56	47.63	< LOD	< LOD	15.81	82.77
ppm	rock n of line 1 0w	588291E 5452590N	< LOD	34.33	< LOD	< LOD	< LOD	70.68
ppm	rock n of line 1 0w	588291E 5452590N	< LOD	42.8	< LOD	< LOD	< LOD	82.59
ppm	sp1 725 granite	588941E 5452730N	< LOD	20.62	< LOD	< LOD	< LOD	82.84
ppm	sp1 750 granite	588964E 5452729N	< LOD	19.02	< LOD	25.16	17.47	85.91
ppm	sp1 870 granite	589071E 5452760N	< LOD	55.08				

W	Th	Mo	Sb	Zr	Sr	U	Rb	Se	Hg	Ni	Co	Fe
< LOD	< LOD	< LOD	< LOD	111.22	221.5	< LOD	136.22	< LOD	< LOD	< LOD	< LOD	10724.17
< LOD	22.06	12.97	77.05	241.75	115.55	< LOD	107.59	< LOD	< LOD	< LOD	< LOD	56059.98
< LOD	< LOD	< LOD	60.33	83.17	121.21	< LOD	75.41	< LOD	< LOD	< LOD	< LOD	4915.7
< LOD	< LOD	< LOD	64.76	146.47	66.38	< LOD	98.85	< LOD	< LOD	< LOD	< LOD	7129.92
< LOD	< LOD	< LOD	72.34	132.19	189.54	< LOD	127.34	< LOD	< LOD	< LOD	< LOD	3729.46
< LOD	< LOD	< LOD	71.72	83.01	173.81	< LOD	225.88	< LOD	< LOD	< LOD	< LOD	5201.58
< LOD	< LOD	< LOD	61.19	225.92	148.3	< LOD	234.66	< LOD	< LOD	< LOD	< LOD	17165.61
< LOD	< LOD	< LOD	73.86	64.26	74.42	< LOD	68.67	< LOD	< LOD	< LOD	< LOD	66866.75
< LOD	31.6	< LOD	127.53	241.87	54.27	< LOD	243.32	< LOD	< LOD	< LOD	< LOD	26542.45
< LOD	< LOD	< LOD	112.34	168.85	102.05	< LOD	224	< LOD	< LOD	< LOD	< LOD	26293.01
< LOD	< LOD	< LOD	163.12	42.06	131.64	< LOD	274.24	< LOD	< LOD	< LOD	< LOD	6908.69
< LOD	16.02	< LOD	33.36	394.17	92.82	< LOD	135.08	< LOD	< LOD	< LOD	< LOD	15829.66
< LOD	20.54	< LOD	39.14	590.51	100.83	< LOD	213.39	< LOD	< LOD	< LOD	< LOD	18582.96
< LOD	< LOD	< LOD	101.11	84.31	137.51	< LOD	296.5	< LOD	< LOD	< LOD	< LOD	6609.15
< LOD	< LOD	< LOD	99.19	82.32	113.82	< LOD	248.45	< LOD	< LOD	< LOD	< LOD	14413.89
< LOD	25.06	< LOD	52.39	160.94	40.8	< LOD	258.36	< LOD	< LOD	< LOD	614.24	56519.86
< LOD	37.43	< LOD	67.42	222.17	39.97	< LOD	236.67	< LOD	< LOD	< LOD	1063.85	89472.94
< LOD	< LOD	< LOD	90.89	239.67	113.07	< LOD	108.1	< LOD	< LOD	< LOD	< LOD	15241.94
< LOD	< LOD	< LOD	91.13	131.71	187.47	< LOD	91.6	< LOD	< LOD	< LOD	< LOD	8647.91
< LOD	23.26	< LOD	47.44	1182.55	12.69	< LOD	20.44	< LOD	< LOD	< LOD	< LOD	834.97

Mn	Cr	V	Ti	Sc	Ca	K	S	Ba	Cs	Te	Cd	Pd
403.97	< LOD	< LOD	2156.92	< LOD	13007.26	13233.15	< LOD	514.8	100.94	138.53	< LOD	< LOD
226.11	< LOD	< LOD	3191.77	< LOD	4412.53	8288.04	< LOD	746.24	158.41	249.11	< LOD	< LOD
< LOD	< LOD	99.13	2044.17	< LOD	4850.75	10577.36	< LOD	502.17	131.6	255.12	< LOD	< LOD
< LOD	< LOD	< LOD	1931.5	< LOD	3275.9	12451.14	< LOD	543.29	119.39	226.93	< LOD	< LOD
125.55	< LOD	< LOD	1093.17	< LOD	12997.47	20567.44	< LOD	591.95	136.81	255.26	21.8	< LOD
128.21	< LOD	< LOD	1761.29	42.64	7781.7	26683.88	< LOD	739.7	149.48	269.33	27.36	< LOD
389.1	< LOD	< LOD	4414.94	< LOD	15982.39	14926.06	< LOD	580.14	144.22	233.9	< LOD	< LOD
506.11	< LOD	< LOD	4880.98	< LOD	5786.88	6343.56	< LOD	773.7	177	290.2	20.76	< LOD
529.86	< LOD	< LOD	2924.62	< LOD	2187.75	26908.66	< LOD	886.42	201.21	337.27	36.89	< LOD
486.76	< LOD	< LOD	2845.28	56.36	4689.17	18144.91	< LOD	1155.04	221.44	455.19	36.26	24.61
< LOD	< LOD	< LOD	858.68	31.35	1798.34	35758.13	< LOD	1528.85	298	545.09	55.52	40.44
308.04	< LOD	< LOD	5969.34	< LOD	10821.15	12735.6	< LOD	393.5	108.63	193.08	< LOD	< LOD
315.84	< LOD	< LOD	3255.09	57.13	11169.34	10712.11	< LOD	499.91	134.59	202.13	< LOD	< LOD
125.22	< LOD	< LOD	1253.27	< LOD	2906.78	72702.39	< LOD	1189.82	191.82	330.7	25.32	< LOD
< LOD	< LOD	< LOD	2858.49	< LOD	1146.01	45820.73	< LOD	1042.46	193.07	375.49	< LOD	25.83
< LOD	87.31	< LOD	3877.34	< LOD	< LOD	36157.35	< LOD	1266.56	146	254.89	< LOD	< LOD
285.14	79.95	152	5533.54	< LOD	< LOD	27176.08	< LOD	1230.07	174.15	268	< LOD	< LOD
456.34	< LOD	< LOD	2312.41	< LOD	5156.13	25750.91	< LOD	590.51	156.39	298.73	< LOD	< LOD
150.43	103.84	< LOD	1603.08	55.27	11041.63	15506.86	< LOD	614.02	156.84	274.27	24.74	21.48
< LOD	< LOD	< LOD	8306.8	< LOD	721.36	7938.37	< LOD	333.74	95.45	182.45	< LOD	< LOD

## Niton Soil Analysis along SP line 1

### Line 1 Soil

Units	SAMPLE	LOCATION	As	Pb	Cu	Zn	Ag	Sn
ppm	sp1 550	588794E 5452684N	< LOD	15.47	< LOD	< LOD	< LOD	50.89
ppm	sp1 675	588902E 5452715N	< LOD	55.06				
ppm	sp1 700	588923E 5452720N	< LOD	30.23				
ppm	sp1 725 soil	588941E 5452730N	< LOD	51.38				
ppm	sp1 750 soil	588964E 5452729N	< LOD	43.15				
ppm	sp1 775 soil	588986E 5452732N	< LOD	53.01				
ppm	sp1 800 soil	589012E 5452742N	< LOD	41.48				
ppm	sp1 825 soil	589036E 5452743N	< LOD	56.27				
ppm	sp1 850 soil	589050E 5452755N	< LOD	38.19				
ppm	sp1 870 soil	589071E 5452760N	< LOD	< LOD	85.99	< LOD	< LOD	28.97

W	Th	Mo	Sb	Zr	Sr	U	Rb	Se	Hg	Ni	Co	Fe
< LOD	29.72	< LOD	61.58	909.7	29.58	< LOD	64.33	< LOD	< LOD	< LOD	< LOD	2435.82
< LOD	17.52	< LOD	68.3	786.58	11.72	< LOD	11.01	< LOD	< LOD	< LOD	< LOD	4236.46
< LOD	27.6	< LOD	42.8	697.94	14.88	< LOD	27.56	< LOD	< LOD	< LOD	< LOD	17953.63
< LOD	14.09	< LOD	52.14	483.07	48.76	< LOD	61.7	< LOD	< LOD	85.76	< LOD	6150.3
< LOD	14.29	< LOD	51.41	454.72	14.57	< LOD	27.37	< LOD	< LOD	< LOD	< LOD	2935.49
< LOD	< LOD	< LOD	65.34	590.92	13.28	< LOD	15.58	< LOD	< LOD	< LOD	< LOD	1632.64
< LOD	15.65	< LOD	52.54	524.93	16.21	< LOD	26.28	< LOD	< LOD	< LOD	< LOD	1926.64
< LOD	11.32	< LOD	58.96	578.02	8.33	< LOD	11.79	< LOD	< LOD	< LOD	< LOD	1250.51
< LOD	< LOD	< LOD	51.15	516.46	< LOD	464.47						
< LOD	< LOD	< LOD	34.76	319.32	10.11	< LOD	796.48					

Mn	Cr	V	Ti	Sc	Ca	K	S	Ba	Cs	Te	Cd	Pd
< LOD	< LOD	< LOD	5212.79	< LOD	759.67	26206.9	< LOD	449.64	109	206.1	< LOD	< LOD
107.08	< LOD	< LOD	7484.29	< LOD	< LOD	3794.45	< LOD	421.82	127.77	169.14	19.63	< LOD
< LOD	< LOD	< LOD	8086.62	< LOD	< LOD	5805.26	< LOD	324.65	81.5	126.15	< LOD	< LOD
< LOD	< LOD	< LOD	5221.91	< LOD	1538.59	19035.26	< LOD	406.85	101.34	203.69	< LOD	< LOD
< LOD	< LOD	< LOD	3269.82	< LOD	< LOD	9047.21	< LOD	359.32	104.03	178.28	< LOD	< LOD
< LOD	< LOD	< LOD	3793.29	< LOD	409.57	6132.44	< LOD	322.18	96.96	170.73	< LOD	< LOD
< LOD	< LOD	< LOD	5634.77	< LOD	337.22	13246.07	< LOD	265.56	67.47	145.4	< LOD	< LOD
< LOD	< LOD	< LOD	4281.97	< LOD	< LOD	7056.08	< LOD	359.69	103.46	194.94	< LOD	< LOD
< LOD	< LOD	< LOD	3606.4	< LOD	< LOD	2038.07	< LOD	293.02	94.42	202.33	< LOD	< LOD
< LOD	< LOD	< LOD	2385.12	< LOD	1029.41	2922.96	< LOD	186.13	60.3	121.47	< LOD	< LOD

**Note:** most sites in the centre of the line consisted only of barren leached coarse quartz sand, and no outcrop.

## NITON analyses of rock samples across survey area (Fig 6).

SAMPLE	LOCATION			Pb	Zn	Ag	Sn	Th	Sb	Zr	Sr
line 3a 375S	588670E	5452309N	weathered granite	28.33	< LOD	26.08	79.2	22.86	113.44	138.15	25.88
sample 9	588573E	5452455N	Dolerite	43.4	< LOD	< LOD	69.31	< LOD	88.31	357.68	450.47
sample 6	588610E	5452480N	Aplite?	42.8	< LOD	15.1	92.16	20.96	97.22	45.37	10.64
sample 5	588592E	5452494N	weathered granite	28.3	< LOD	15.22	96.32	28.77	106.88	407.22	50.8
sample 8	588730E	5452189N	microgranite	23.7	46.34	15.9	78.68	< LOD	85.29	147.63	97.2
sample 8	588730E	5452189N	microgranite	< LOD	48.56	< LOD	49.9	19.47	48.79	203.01	107.22
sample 8	588730E	5452189N	microgranite	22.05	49.36	17.17	88.75	< LOD	89.82	188.94	102.39
sample 4a	588440E	5452243N	Dolerite (lighter colour)	< LOD	< LOD	17.8	93.08	< LOD	88.39	292.47	345.06
sample 4	588430E	5452233N	Dolerite	25.61	102.17	< LOD	155.77	< LOD	168.36	262.28	206.93
sample 4	588430E	5452233N	Dolerite	21.41	123.17	18.75	101.67	< LOD	127.83	345.69	259.78
sample 4	588430E	5452233N	Dolerite	30.54	< LOD	< LOD	75.62	22.3	72.59	404.73	246.36
sample 3	588620E	5452745N	?	15.56	34.05	< LOD	76.79	14.64	65.4	453.06	31.52
sample 3	588620E	5452745N	?	< LOD	< LOD	< LOD	65.35	14.27	54.91	429.04	51.42
sample2	588680E	5452685N	Dolerite	21.15	103.31	< LOD	106.94	< LOD	93.19	283.13	286.67
sample 1	588589E	5452557N	Dolerite (lighter colour)	< LOD	83.55	21.84	97.02	< LOD	101.56	274.06	332.5
sample 1	588589E	5452557N	Dolerite (darker)	87.83	< LOD	< LOD	115.81	< LOD	111.74	330.51	429.76

Rb	Ni	Co	Fe	Mn	Cr	V	Ti	Sc	Ca	K	Ba	Cs	Te	Cd
141.76	< LOD	< LOD	29018.93	270.94	< LOD	< LOD	3318.43	61.89	< LOD	10010.06	723.93	196.55	390.2	33.18
190.09	< LOD	595.43	66410.85	367.27	< LOD	< LOD	6031.5	< LOD	15263.7	10473.13	827.25	135.21	218.95	< LOD
369.3	< LOD	< LOD	3187.56	102.26	< LOD	< LOD	778.76	< LOD	2476.61	55328.57	499.14	150.39	328.04	< LOD
99.12	< LOD	< LOD	22213.41	< LOD	< LOD	< LOD	3265.64	35.87	893.75	13594.56	824.9	171.61	321.38	< LOD
183.02	< LOD	< LOD	20864.01	286.11	< LOD	< LOD	3177.48	65.65	10612.75	16119.31	590.05	153.07	322.54	31
184.03	< LOD	< LOD	29591.47	227.25	< LOD	< LOD	3090.94	< LOD	5538.27	11590.87	499.67	115.14	188.17	< LOD
116.39	< LOD	< LOD	23829.33	354.04	< LOD	< LOD	4006.56	< LOD	8762.14	9689.76	577.89	160.01	251.5	24.29
106.22	< LOD	< LOD	61695.53	899.66	< LOD	< LOD	2955.3	< LOD	18762.64	9521.44	766.21	164.63	350.02	23.36
172.65	321.81	< LOD	221955.1	729.01	< LOD	< LOD	635.59	< LOD	1632.53	2328.31	1194.84	281.04	518.24	36.3
114.04	< LOD	< LOD	97065.4	1092.67	< LOD	154.25	3496.02	< LOD	12031.47	5597.89	897.31	215.03	333.49	29.15
126.74	< LOD	< LOD	152107.8	518.82	< LOD	< LOD	11952.41	< LOD	3183.71	3901.99	857.4	169.67	307.43	< LOD
65.88	< LOD	< LOD	4113.12	< LOD	50.58	< LOD	6270.89	< LOD	< LOD	6929.77	641.53	140.25	252.76	< LOD
65.14	< LOD	< LOD	4232.84	144.56	< LOD	< LOD	7059.61	< LOD	892.21	10075.3	610.48	116.92	232.25	< LOD
86.44	< LOD	< LOD	72942.38	1243.15	122.43	< LOD	4522.9	< LOD	14826.87	4870.18	861.49	212.9	348.94	28.93
100.65	< LOD	< LOD	72151.88	1042.57	< LOD	< LOD	3576.75	< LOD	13933.83	4650.12	1084.01	227.97	375.58	34.26
33.46	< LOD	< LOD	145221.7	472.41	< LOD	< LOD	4711.48	< LOD	15873.73	3876.63	826.1	219.52	399.29	36.2

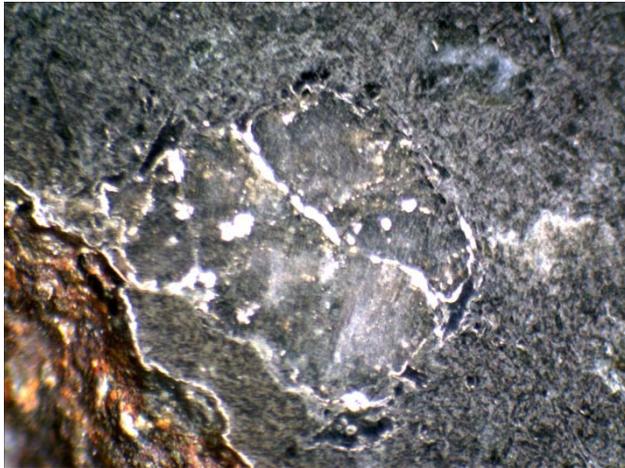
## AAS (aqua regia digestion) bulk analysis of dolerite sample 4 (N. Allen)

Cu 72 ppm  
Pb 24 ppm  
Zn 112 ppm  
Ni 32 ppm

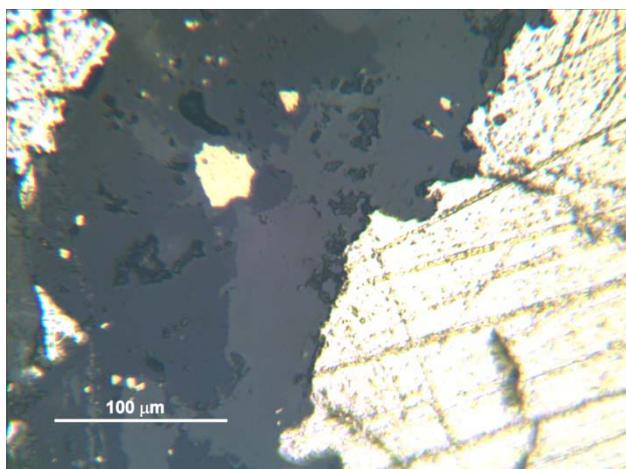
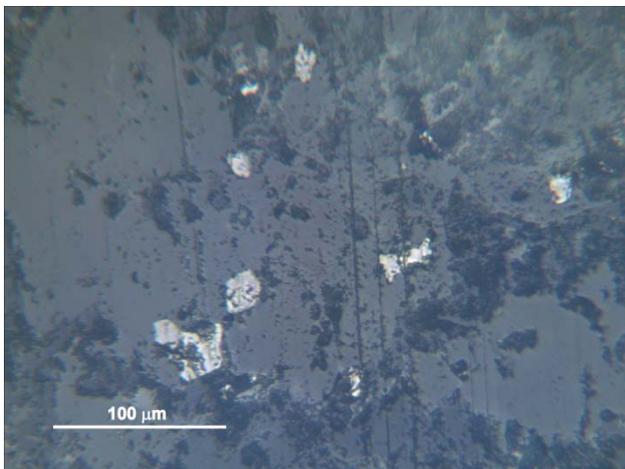
**Note:** Portion of dolerite sample used did not include any in which sulphides could be seen.

## Appendix D: Dolerite sample 4 microphotographs

Low power



High power



**Note:** The above sulphides(?) were only observed in one restricted area of sample 4, which was towards the outside of the sample.

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